

**MY RIGHT HAND**

# The impact of e-learning on early childhood education

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Ages between 3 and 5 years

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## Introduction

This section displays the results of the study; it includes descriptive and inferential statistics. The purpose of the study is to evaluate the impact of e-learning on early childhood education (age from 3-5). The sample included 134 children, whereby 100 of the children are using the Tabshoura/kindergarten e-learning platform and the remaining 34 are taught using the traditional learning approach. The evaluation is based on the “Learning Objectives”. Therefore, the study intends to examine whether better learning is provided to children using e-learning material.

This is the glossary of some of the terms that will be used in the statistical analysis:

- a. **Mean:** The most common expression for the mean of a statistical distribution with a discrete random variable is the mathematical average of all the terms. To calculate it, we add up the values of all the terms and then divide by the number of terms.
- b. **Standard deviation:** A measure of the dispersion or spread of values of a variable (e.g Salary of employees in banks) around a population mean value.
- c. **CV or coefficient of variation:** It's an indicator to study exactly the dispersion or the concentration around the mean, when this indicator approaches to 100% we can say that we have a strong dispersion and when it approaches to 0% we can say that we have a strong concentration.

$$CV = \frac{\text{Standard deviation}}{\text{Mean}}$$

## DESCRIPTIVE STATISTICS

### A. Pre-test results for the control group (Not using the Tabshoura/kindergarten e-learning platform):

#### A. 1. Computer

	Able	Learning	Unable
Has knowledge of basic computer hardware (screen, mouse, keyboard)	0.00%	0.00%	100.00%
Masters drag-and-drop	0.00%	0.00%	100.00%
Masters the click	0.00%	0.00%	100.00%
Locates items on the screen	0.00%	0.00%	100.00%
Spots icons on the homepage	0.00%	0.00%	100.00%

Table 1. Pre-test results for the control group: Computer

In the pretest for the control group, the students don't possess any knowledge about computer; all of them don't have the knowledge of basic computer hardware (Unable = 100.00%), Masters drag-and-drop (Unable = 100.00%), Masters the click (Unable = 100.00%), Locates items on the screen (Unable = 100.00%) and Spots icons on the homepage (Unable = 100.00%).

#### A. 2. Linguistic Expression

##### A. 2. 1. Focused listening

	Able	Learning	Unable
Listens to a story for 5 minutes	14.71%	76.47%	8.82%
Listens to a song for 3 minutes	14.71%	76.47%	8.82%
Listens with the aim of answering comprehension questions	8.82%	67.65%	23.53%

Table 2. Pre-test results for the control group: Focused listening

The results for the control group about focused listening in the pre-test stage showed the following:

1. Listens to a story for 5 minutes: 76.47% of the control group students are learning how to listen to a story for 5 minutes, 14.71% of them are able to do that while 8.82% are unable to listen to a story for 5 minutes.

2. Listens to a song for 3 minutes: 76.47% of the control group students are learning how to listen to a song for 3 minutes, 14.71% of them are able to do that while 8.82% are unable to listen to a song for 3 minutes.
3. Listens with the aim of answering comprehension questions: 67.65% of the control group students are learning how to listen and answer comprehension questions, 23.53% are unable to do that while 8.82% can listen and answer comprehension questions.

### A. 2. 2. Books

	Able	Learning	Unable
Identifies different types of writing (recipe, tale, manual)	2.94%	73.53%	23.53%
Recognizes a tale from its images	5.88%	67.65%	26.47%
Matches characters to their corresponding tale	2.94%	73.53%	23.53%
Reorganizes in chronological order	2.94%	73.53%	23.53%

Table 3. Pre-test results for the control group: Books

The results for the control group about books in the pre-test stage showed:

1. Identifies different types of writing: 73.53% of the control group's students are learning how to identify different types of images, 23.53% of them are unable to do that while 2.94% are able to identify different types of writing.
2. Recognizes a tale from its images: 67.65% of the control group's students are learning how to recognize a tale from its images, 26.47% of them are unable to do that while 5.88% are able to recognize a tale from its images.
3. Matches characters to their corresponding tale: 73.53% of the control group's students are learning how to match characters to their corresponding tale, 23.53% of them are unable to do that while 2.94% are able to match characters to their corresponding tale.
4. Reorganizes in chronological order: 73.53% of the control group's students are learning how to reorganize in chronological order, 23.53% of them are unable to do that while 2.94% are able to reorganize in chronological order.

### A. 2. 3. Environment

	Able	Learning	Unable
Identifies the objects that surround him	14.71%	64.71%	20.58%
Recognizes members of the family	17.65%	73.53%	8.82%
Recognizes good behaviors	8.82%	70.59%	20.59%
Is space oriented/understands spatial concepts	5.88%	58.82%	35.29%

Table 4. Pre-test results for the control group: Environment

The results for the control group about environment in the pre-test stage showed the following:

1. Identifies the objects that surround him: 64.71% of the control group's students are learning how to identify the objects that surround them, 20.58% of them are unable to do that while 14.71% are able to identify the objects that surround them.
2. Recognizes members of the family: 73.53% of the control group's students are learning how to recognize member of their families, 17.65% of them are able to do that while 8.82% are unable to recognize members of their families.
3. Recognizes good behaviors: 70.59% of the control group's students are learning how to recognize good behaviors, 20.59% of them are unable to do that while 8.82% are able to recognize good behaviors.
4. Is space oriented/understands spatial concepts: 58.82% of the control group's students are learning to understand spatial concepts, 35.29% of them are unable to do that while 5.88% are able to understand spatial concepts.

#### A. 2. 4. Food

	Able	Learning	Unable
Classifies foods according to their particularity	5.88%	67.65%	26.47%
Identifies the ingredients of a recipe	2.94%	61.76%	35.29%
Identifies the source of food	0.00%	70.59%	29.41%
Recognizes healthy food	2.94%	73.53%	23.53%

Table 5. Pre-test results for the control group: Food

The results for the control group about food in the pre-test stage showed:

1. Classifies foods according to their particularity: 67.65% of the control group's students are learning how to classify food according to their particularity, 26.47% of them are unable to do that while 5.88% are able to classify food according to their particularity.
2. Identifies the ingredients of a recipe: 61.76% of the control group's students are learning how to identify the ingredients of a recipe, 35.29% of them are unable to do that while 2.94% are able to identify the ingredients of a recipe.
3. Identifies the source of food: 70.59% of the control group's students are learning how to identify the source of food while 29.41% of them are unable to do that.
4. Recognizes healthy food: 73.53% of the control group's students are learning how to reorganize healthy food, 23.53% of them are unable to do that while 2.94% are able to reorganize healthy food.

### A. 2. 5. Matching items

	Able	Learning	Unable
Associates identical items	23.53%	76.47%	0.00%
Associates identical shapes	23.53%	76.47%	0.00%
Associates identical colors	23.53%	76.47%	0.00%
Combines elements according to one common characteristic	20.59%	64.71%	14.71%

Table 6. Pre-test results for the control group: Matching items

The results for the control group about matching items in the pre-test stage showed the following:

1. Associates identical items: 76.47% of the control group's students are learning how to associate identical items while 23.53% of them are able to do that.
2. Associates identical shapes: 76.47% of the control group's students are learning how to associate identical shapes while 23.53% of them are able to do that.
3. Associates identical colors: 76.47% of the control group's students are learning how to associate identical colors while 23.53% of them are able to do that.
4. Combines elements according to one common characteristic: 64.71% of the control group's students are learning how to combine elements according to one common characteristic, 20.59% of them are able to do that while 14.71% are unable to combine elements according to one common characteristic.

### A. 2. 6. Series

	Able	Learning	Unable
Finds the odd one out in a series	5.88%	55.88%	38.24%
Completes a series	8.82%	67.65%	23.53%

Table 7. Pre-test results for the control group: Linguistic expression/Series

The results for the control group about series (Linguistic expression) in the pre-test stage showed:

1. Finds the odd one out in a series: 55.88% of the control group's students are learning how to find the odd one out in a series, 38.24% of them are unable to do that while 5.88% are able to find the odd one out in a series.

2. Completes a series: 67.65% of the control group's students are learning how to complete a series, 23.53% of them are unable to do that while 8.82% are able to complete a series.

#### **A. 2. 7. Images**

	<b>Able</b>	<b>Learning</b>	<b>Unable</b>
<b>Matches a word to an image</b>	5.88%	52.94%	41.18%
<b>Identifies the elements of an image</b>	11.76%	64.71%	23.53%
<b>Identifies images according to their characteristics</b>	5.88%	64.71%	29.41%
<b>Rebuilds an image</b>	5.88%	64.71%	29.41%

**Table 8. Pre-test results for the control group: Images**

The results for the control group about images in the pre-test stage showed:

1. Matches a word to an image: 52.94% of the control group's students are learning how to match a word to an image, 41.18% of them are unable to do that while 5.88% are able to match a word to an image.
2. Identifies the elements of an image: 64.71% of the control group's students are learning how to identify the elements of an image, 23.53% of them are unable to do that while 2.94% are able to identify the elements of an image.
3. Identifies images according to their characteristics: 64.71% of the control group's students are learning how to identify images according to their characteristics, 29.41% are unable to do that while 5.88% are able to identify images according to their characteristics.
4. Rebuilds an image: 64.71% of the control group's students are learning how to rebuild an image, 29.41% of them are unable to do that while 5.88% are able to rebuilds an image.



### A. 2. 8. Words

	Able	Learning	Unable
Identifies a word	2.94%	2.94%	94.12%
Reconstitutes a word	0.00%	5.88%	94.12%
Associates identical words	2.94%	8.82%	88.24%
Counts the syllables of a word	0.00%	5.88%	94.12%

Table 9. Pre-test results for the control group: Words

The results for the control group about words in the pre-test stage showed the following:

1. Identifies a word: 94.12% of the control group's students are unable to identify a word while 2.94% of them are able to do that and also 2.94% are learning how to identify a word.
2. Reconstitutes a word: 94.12% of the control group's students are unable to reconstitute a word while 5.88% of them are learning how to do that.
3. Associates identical words: 88.24% of the control group's students are unable to associate identical words while 8.82% of them are learning how to do that and 2.94% are able to associate identical words.
4. Counts the syllables of a word: 94.12% of the control group's students are unable to count the syllables of a word while 5.88% of them are learning how to do that.

### A. 3. Sciences

#### A. 3. 1. Matching

	Able	Learning	Unable
Associates identical elements	23.53%	76.47%	0.00%
Associates identical colors	23.53%	76.47%	0.00%
Combines elements according to one common characteristic	23.53%	73.53%	2.94%

Table 10. Pre-test results for the control group: Matching

The results for the control group about matching in the pre-test stage showed:

1. Associates identical elements: 76.47% of the control group's students are learning how to associate identical elements while 23.53% are able to do that.
2. Associates identical colors: 76.47% of the control group's students are learning how to associate identical colors while 23.53% are able to do that.

- Combines elements according to one common characteristic: 73.53% of the control group's students are learning how to combine elements according to one common characteristic, 23.53% are able to do that while 2.94% are unable to combine elements according to one common characteristic.

### A. 3. 2. Numbers

	Able	Learning	Unable
Uses numbers from 1 to 5	23.53%	76.47%	0.00%

Table 11. Pre-test results for the control group: Numbers

In the pretest for the control group, 76.47% of the students are learning how to use numbers from 1 to 5 while 23.53% of them are able to do that.

### A. 3. 3. Series

	Able	Learning	Unable
Fills in what is missing	8.82%	64.71%	26.47%
Fills in a repetitive series	8.82%	61.76%	29.42%

Table 12. Pre-test results for the control group: Sciences/Series

The results for the control group about series (Sciences) in the pre-test stage showed:

- Fills in what is missing: 64.71% of the control group's students are learning how to fill in what is missing, 26.47% of them are unable to do that while 8.82% are able to fill in what is missing.
- Fills in a repetitive series: 61.76% of the control group's students are learning how to fill in a repetitive series, 29.42% of them are unable to do that while 8.82% are able to fill in a repetitive series.

#### A. 3. 4. Living

	Able	Learning	Unable
Recognizes the stages of growth	11.76%	64.71%	23.53%
Recognizes living creatures	8.82%	73.53%	17.65%
Identifies the needs of a plant	20.59%	61.76%	17.65%
Respects the environment	0.00%	73.53%	26.47%
Knows the rules of hygiene	5.88%	73.53%	20.59%

Table 13. Pre-test results for the control group: Living

The results for the control group about Living in the pre-test stage showed the following:

1. Recognizes the stages of growth: 64.71% of the control group's students are learning how to recognize the stages of growth, 23.53% of them are unable to do that while 11.76% are able to recognize the stages of growth.
2. Recognizes living creatures: 73.53% of the control group's students are learning how to recognize living creatures, 17.65% of them are unable to do that while 8.82% are able to recognize living creatures.
3. Identifies the needs of a plant: 61.76% of the control group's students are learning how to identify the needs of a plant, 20.59% are able to do that while 17.65% are unable to identify the needs of a plant.
4. Respects the environment: 73.53% of the control group's students are learning how to respect the environment while 26.47% of them are unable to do that.
5. Knows the rules of hygiene: 73.53% of the control group's students are learning how to know the rules of hygiene, 20.59% are unable to do that while 5.88% are able to know the rules of hygiene.

### A. 3. 5. Spatial awareness

	Able	Learning	Unable
Spots the location of objects (under, on, in front, behind)	2.94%	85.29%	11.77%
Recognizes the orientation of objects (left, right)	2.94%	82.35%	14.71%

Table 14. Pre-test results for the control group: Spatial awareness

The results for the control group about spatial awareness in the pre-test stage showed:

1. Spots the location of objects: 85.29% of the control group's students are learning how to spot the location of objects, 11.77% of them are unable to do that while 2.94% are able to spot the location of objects.
2. Recognizes the orientation of objects: 82.35% of the control group's students are learning how to recognize the orientation of objects, 14.71% of them are unable to do that while 2.94% are able to recognize the orientation of objects.

### A. 3. 6. Temporal awareness

	Able	Learning	Unable
Distinguishes the seasons	2.94%	73.53%	23.53%
Reorganizes elements in chronological order	2.94%	76.47%	20.59%

Table 15. Pre-test results for the control group: Spatial awareness

The results for the control group about temporal awareness in the pre-test stage showed the following:

1. Distinguishes the seasons: 73.53% of the control group's students are learning how to distinguish the seasons, 23.53% of them are unable to do that while 2.94% are able to distinguish the seasons.
2. Reorganizes elements in chronological order: 76.47% of the control group's students are learning how to reorganizes elements in chronological order, 20.59% of them are unable to do that while 2.94% are able to reorganizes elements in chronological order.

### A. 3. 7. Shapes and sizes

	Able	Learning	Unable
Recognizes basic shapes	20.59%	79.41%	0.00%
Recognizes objects according to their size	20.59%	79.41%	0.00%
Understands the terms many/few	8.82%	88.24%	2.94%

Table 16. Pre-test results for the control group: Shapes and sizes

The results for the control group about Living in the pre-test stage showed:

1. Recognizes basic shapes: 79.41% of the control group's students are learning how to recognize basic shapes while 20.59% of them are able to do that.
2. Recognizes objects according to their size: 79.41% of the control group's students are learning how to recognize objects according to their size while 20.59% of them are able to do that.
3. Understands the terms many/few: 88.24% of the control group's students are learning how to understand the terms many/few, 8.82% are able to do that while 2.94% are unable to understand the terms many/few.

## **B. Pre-test results for the experimental group (Using the Tabshoura /kindergarten e-learning platform)**

### **B. 1. Computer**

	<b>Able</b>	<b>Learning</b>	<b>Unable</b>
<b>Has knowledge of basic computer hardware (screen, mouse, keyboard)</b>	1.00%	25.00%	74.00%
<b>Masters drag-and-drop</b>	0.00%	20.00%	80.00%
<b>Masters the click</b>	0.00%	20.00%	80.00%
<b>Locates items on the screen</b>	0.00%	21.00%	79.00%
<b>Spots icons on the homepage</b>	0.00%	21.00%	79.00%

**Table 17. Pre-test results for the experimental group: Computer**

The results for the experimental group about computer in the pre-test stage showed the following:

1. Has knowledge of basic computer hardware: 74.00% of the experimental group's students don't have knowledge of basic computer hardware, 25.00% of them are learning how to do that while 1.00% have knowledge of basic computer hardware.
2. Masters drag-and-drop: 80.00% of the experimental group's students cannot master drag-and-drop while 20.00% are learning how to do that.
3. Masters the click: 80.00% of the experimental group's students cannot master the click while 20.00% are learning how to do that.
4. Locates items on the screen: 79.00% of the experimental group's students are unable to locate items on the screen while 21.00% are learning how to do that.
5. Spots icons on the homepage: 79.00% of the experimental group's students are unable to spot icons on the homepage while 21.00% are learning how to do that.

## B. 2. Linguistic Expression

### B. 2.1. Focused listening

	Able	Learning	Unable
Listens to a story for 5 minutes	64.00%	31.00%	5.00%
Listens to a song for 3 minutes	71.00%	25.00%	4.00%
Listens with the aim of answering comprehension questions	25.00%	39.00%	36.00%

Table 18. Pre-test results for the experimental group: Focused listening

The results for the experimental group about focused listening in the pre-test stage showed the following:

1. Listens to a story for 5 minutes: 64.00% of the experimental group students are able to listen to a story for 5 minutes, 31.00% of them are learning how to do that while 5.00% are unable to listen to a story for 5 minutes.
2. Listens to a song for 3 minutes: 71.00% of the experimental group students are able to listen to a song for 3 minutes, 25.00% of them are learning how to do that while 4.00% are unable to listen to a song for 3 minutes.
3. Listens with the aim of answering comprehension questions: 39.00% of the experimental group students are learning how to listen and answer comprehension questions, 36.00% are unable to do that while 25.00% can listen and answer comprehension questions.

### B. 2.2. Books

	Able	Learning	Unable
Identifies different types of writing (recipe, tale, manual)	25.00%	25.00%	50.00%
Recognizes a tale from its images	11.00%	48.00%	41.00%
Matches characters to their corresponding tale	4.00%	28.00%	68.00%
Reorganizes in chronological order	25.00%	40.00%	35.00%

Table 19. Pre-test results for the experimental group: Books

The results for the experimental group about books in the pre-test stage showed:

1. Identifies different types of writing: 50.00% of the experimental group's students are unable to identify different types of images, 25.00% of them are able to do that while 25.00% are learning how to identify different types of writing.
2. Recognizes a tale from its images: 48.00% of the experimental group's students are learning how to recognize a tale from its images, 41.00% of them are unable to do that while 11.00% are able to recognize a tale from its images.
3. Matches characters to their corresponding tale: 68.00% of the experimental group's students are unable to match characters to their corresponding tale, 28.00% of them are learning how to do that while 25.00% are able to match characters to their corresponding tale.
4. Reorganizes in chronological order: 40.00% of the control group's students are learning how to reorganize in chronological order, 35.00% of them are unable to do that while 25.00% are able to reorganize in chronological order.



### B. 2.3. Environment

	Able	Learning	Unable
Identifies the objects that surround him	50.00%	27.00%	23.00%
Recognizes members of the family	58.00%	24.00%	18.00%
Recognizes good behaviors	25.00%	58.00%	17.00%
Is space oriented/understands spatial concepts	25.00%	43.00%	32.00%

Table 20. Pre-test results for the experimental group: Environment

The results for the experimental group about environment in the pre-test stage showed the following:

1. Identifies the objects that surround him: 50.00% of the experimental group's students are able to identify the objects that surround them, 27.00% of them are learning how to do that while 23.00% are unable to identify the objects that surround them.
2. Recognizes members of the family: 58.00% of the experimental group's students are able to recognize member of their families, 24.00% of them are learning how to do that while 18.00% are unable to recognize members of their families.
3. Recognizes good behaviors: 58.00% of the experimental group's students are learning how to recognize good behaviors, 25.00% of them are able to do that while 17.00% are unable to recognize good behaviors.
4. Is space oriented/understands spatial concepts: 43.00% of the experimental group's students are learning to understand spatial concepts, 32.00% of them are unable to do that while 25.00% are able to understand spatial concepts.

### B. 2.4. Food

	Able	Learning	Unable
Classifies foods according to their particularity	28.00%	43.00%	29.00%
Identifies the ingredients of a recipe	3.00%	45.00%	52.00%
Identifies the source of food	1.00%	64.00%	35.00%
Recognizes healthy food	10.00%	65.00%	25.00%

Table 21. Pre-test results for the experimental group: Food

The results for the experimental group about food in the pre-test stage showed:

1. Classifies foods according to their particularity: 43.00% of the experimental group's students are learning how to classify food according to their particularity, 29.00% of them are unable to do that while 28.00% are able to classify food according to their particularity.
2. Identifies the ingredients of a recipe: 52.00% of the experimental group's students are unable to identify the ingredients of a recipe, 45.00% of them are learning how to do that while 3.00% are able to identify the ingredients of a recipe.
3. Identifies the source of food: 64.00% of the experimental group's students are learning how to identify the source of food, 35.00% of them are unable to do that while 1.00% is able to identify the source of food.
4. Recognizes healthy food: 65.00% of the experimental group's students are learning how to reorganize healthy food, 25.00% of them are unable to do that while 10.00% are able to reorganize healthy food.

### B. 2.5. Matching items

	Able	Learning	Unable
Associates identical items	29.00%	53.00%	18.00%
Associates identical shapes	42.00%	39.00%	19.00%
Associates identical colors	42.00%	41.00%	17.00%
Combines elements according to one common characteristic	0.00%	52.00%	48.00%

Table 22. Pre-test results for the experimental group: Matching items

The results for the experimental group about matching items in the pre-test stage showed the following:

1. Associates identical items: 53.00% of the experimental group's students are learning how to associate identical items, 29.00% of them are able to do that while 18.00% are unable to associate identical items.
2. Associates identical shapes: 42.00% of the experimental group's students are able to associate identical shapes, 39.00% are learning how to do that while 19.00% of them are unable to do that.
3. Associates identical colors: 42.00% of the experimental group's students are able to associate identical colors, 41.00% of them are learning how to do that while 17.00% of them are unable to do that.
4. Combines elements according to one common characteristic: 52.00% of the experimental group's students are learning how to combine elements according to one common characteristic while 48.00% of them are unable to do that.

### B. 2.6. Series

	Able	Learning	Unable
Finds the odd one out in a series	0.00%	45.00%	55.00%
Completes a series	0.00%	45.00%	55.00%

Table 23. Pre-test results for the experimental group: Linguistic expression/Series

The results for the experimental group about series (Linguistic expression) in the pre-test stage showed:

1. Finds the odd one out in a series: 55.00% of the experimental group's students are unable to find the odd one out in a series while 45.00% are learning how to do that.
2. Completes a series: 55.00% of the experimental group's students are unable to complete a series while 45.00% are learning how to do that.

### B. 2.7. Images

	Able	Learning	Unable
Matches a word to an image	0.00%	19.00%	81.00%
Identifies the elements of an image	20.00%	28.00%	52.00%
Identifies images according to their characteristics	29.00%	29.00%	42.00%
Rebuilds an image	0.00%	17.00%	83.00%

Table 24. Pre-test results for the experimental group: Images

The results for the experimental group about images in the pre-test stage showed:

1. Matches a word to an image: 81.00% of the experimental group's students are unable to match a word to an image while 19.00% of them are learning how to do that.
2. Identifies the elements of an image: 52.00% of the experimental group's students are unable to identify the elements of an image, 28.00% of them are learning how to do that while 20.00% are able to identify the elements of an image.
3. Identifies images according to their characteristics: 42.00% of the experimental group's students are unable to identify images according to their characteristics, 29.00% are learning how to do that also 29.00% are able to identify images according to their characteristics.

4. Rebuilds an image: 83.00% of the experimental group's students are unable to rebuild an image while 17.00% are learning how to do that.

### **B. 2.8. Words**

	Able	Learning	Unable
Identifies a word	0.00%	11.00%	89.00%
Reconstitutes a word	0.00%	8.00%	92.00%
Associates identical words	0.00%	11.00%	89.00%
Counts the syllables of a word	0.00%	8.00%	92.00%

Table 25. Pre-test results for the experimental group: Words

The results for the experimental group about words in the pre-test stage showed the following:

1. Identifies a word: 89.00% of the experimental group's students are unable to identify a word while 11.00% of them are learning how to do that.
2. Reconstitutes a word: 92.00% of the experimental group's students are unable to reconstitute a word while 8.00% of them are learning how to do that.
3. Associates identical words: 89.00% of the experimental group's students are unable to associates identical words while 11.00% of them are learning how to do that.
4. Counts the syllables of a word: 92.00% of the experimental group's students are unable to count the syllables of a word while 8.00% of them are learning how to do that.

## B. 3. Sciences

### B. 3.1. Matching

	Able	Learning	Unable
Associates identical elements	12.00%	63.00%	25.00%
Associates identical colors	12.00%	65.00%	23.00%
Combines elements according to one common characteristic	0.00%	46.00%	54.00%

Table 26. Pre-test results for the experimental group: Matching

The results for the experimental group about matching in the pre-test stage showed:

1. Associates identical elements: 63.00% of the experimental group's students are learning how to associate identical elements, 25.00% of them are unable to do that while 12.00% are able to associate identical elements.
2. Associates identical colors: 65.00% of the experimental group's students are learning how to associate identical colors, 23.00% are unable to do that while 12.00% are able to associate identical colors.
3. Combines elements according to one common characteristic: 54.00% of the experimental group's students are unable to combine elements according to one common characteristic while 46.00% are learning how to do that.

### B. 3.2. Numbers

	Able	Learning	Unable
Uses numbers from 1 to 5	18.00%	70.00%	12.00%

Table 27. Pre-test results for the experimental group: Numbers

In the pretest for the experimental group, 70.00% of the students are learning how to use numbers from 1 to 5, 18.00% of them are able to do that while 12.00% are unable to use numbers from 1 to 5.

### B. 3.3. Series

	Able	Learning	Unable
Fills in what is missing	0.00%	64.00%	34.00%
Fills in a repetitive series	0.00%	50.00%	50.00%

Table 28. Pre-test results for the experimental group: Sciences/Series

The results for the experimental group about series (Sciences) in the pre-test stage showed:

1. Fills in what is missing: 64.00% of the experimental group's students are learning how to fill in what is missing while 34.00% of them are unable to do that.
2. Fills in a repetitive series: 50.00% of the experimental group's students are learning how to fill in a repetitive series also the same percentage of students are unable to do that.

### B. 3.4. Living

	Able	Learning	Unable
Recognizes the stages of growth	0.00%	46.00%	54.00%
Recognizes living creatures	1.00%	37.00%	62.00%
Identifies the needs of a plant	0.00%	61.00%	39.00%
Respects the environment	9.00%	63.00%	28.00%
Knows the rules of hygiene	5.00%	70.00%	25.00%

Table 29. Pre-test results for the experimental group: Living

The results for the experimental group about Living in the pre-test stage showed the following:

1. Recognizes the stages of growth: 54.00% of the experimental group's students are unable to recognize the stages of growth while 46.00% of them are learning how to do that.
2. Recognizes living creatures: 62.00% of the experimental group's students are unable to recognize living creatures, 37.00% of them are learning how to do that while 1.00% is able to recognize living creatures.
3. Identifies the needs of a plant: 61.00% of the experimental group's students are learning how to identify the needs of a plant while 39.00% are unable to do that.

4. Respects the environment: 63.00% of the experimental group's students are learning how to respect the environment, 28.00% of them are unable to do that while 9.00% are able to respect the environment.
5. Knows the rules of hygiene: 70.00% of the experimental group's students are learning how to know the rules of hygiene, 25.00% are unable to do that while 5.00% are able to know the rules of hygiene.

### **B. 3.5. Spatial awareness**

	Able	Learning	Unable
Spots the location of objects (under, on, in front, behind)	8.00%	60.00%	32.00%
Recognizes the orientation of objects (left, right)	11.00%	59.00%	30.00%

**Table 30. Pre-test results for the experimental group: Spatial awareness**

The results for the experimental group about spatial awareness in the pre-test stage showed:

1. Spots the location of objects: 60.00% of the experimental group's students are learning how to spot the location of objects, 32.00% of them are unable to do that while 8.00% are able to spot the location of objects.
2. Recognizes the orientation of objects: 59.00% of the experimental group's students are learning how to recognize the orientation of objects, 30.00% of them are unable to do that while 11.00% are able to recognize the orientation of objects.



### B. 3.6. Temporal awareness

	Able	Learning	Unable
Distinguishes the seasons	30.00%	43.00%	27.00%
Reorganizes elements in chronological order	0.00%	64.00%	36.00%

Table 31. Pre-test results for the experimental group: Spatial awareness

The results for the experimental group about temporal awareness in the pre-test stage showed the following:

1. Distinguishes the seasons: 43.00% of the experimental group's students are learning how to distinguish the seasons, 30.00% of them are able to do that while 27.00% are unable to distinguish the seasons.
2. Reorganizes elements in chronological order: 64.00% of the experimental group's students are learning how to reorganize elements in chronological order while 36.00% of them are unable to do that.

### B. 3.7. Shapes and sizes

	Able	Learning	Unable
Recognizes basic shapes	29.00%	50.00%	21.00%
Recognizes objects according to their size	29.00%	51.00%	20.00%
Understands the terms many/few	6.00%	44.00%	50.00%

Table 32. Pre-test results for the experimental group: Shapes and sizes

The results for the experimental group about Living in the pre-test stage showed:

1. Recognizes basic shapes: 50.00% of the experimental group's students are learning how to recognize basic shapes, 29.00% of them are able to do that while 21.00% are unable to recognize basic shapes.
2. Recognizes objects according to their size: 51.00% of the experimental group's students are learning how to recognize objects according to their size, 29.00% of them are able to do that while 20.00% are unable to recognize objects according to their size.
3. Understands the terms many/few: 50.00% of the experimental group's students are unable to understand the terms many/few, 44.00% are learning how to do that while 6.00% are able to understands the terms many/few.

## C. Post-test results for the control group (Not using the Tabshoura /kindergarten e-learning platform)

### C. 1. Computer

	Able	Learning	Unable
Has knowledge of basic computer hardware (screen, mouse, keyboard)	0.00%	5.88%	94.12%
Masters drag-and-drop	0.00%	5.88%	94.12%
Masters the click	0.00%	5.88%	94.12%
Locates items on the screen	0.00%	5.88%	94.12%
Spots icons on the homepage	0.00%	5.88%	94.12%

Table 33. Post-test results for the control group: Computer

In the Posttest for the control group, 94.12% the students don't have any knowledge about basic computer hardware, Masters drag-and-drop, Masters the click, Locates items on the screen and Spots icons on the homepage while 5.88% of the students are learning these skills.

### C. 2. Linguistic Expression

#### C. 2.1. Focused listening

	Able	Learning	Unable
Listens to a story for 5 minutes	14.71%	85.29%	0.00%
Listens to a song for 3 minutes	14.71%	85.29%	0.00%
Listens with the aim of answering comprehension questions	14.71%	85.29%	0.00%

Table 34. Post-test results for the control group: Focused listening

The results for the control group about focused listening in the Post-test stage showed the following:

1. Listens to a story for 5 minutes: 85.29% of the control group students are learning how to listen to a story for 5 minutes while 14.71% of them are able to do that.
2. Listens to a song for 3 minutes: 85.29% of the control group students are learning how to listen to a song for 3 minutes while 14.71% of them are able to do that.
3. Listens with the aim of answering comprehension questions: 85.29% of the control group students are learning how to listen and answer comprehension questions while 14.71% are able to do that.

### C. 2.2. Books

	Able	Learning	Unable
Identifies different types of writing (recipe, tale, manual)	11.76%	88.24%	0.00%
Recognizes a tale from its images	14.71%	85.29%	0.00%
Matches characters to their corresponding tale	11.76%	88.24%	0.00%
Reorganizes in chronological order	14.71%	85.29%	0.00%

Table 35. Post-test results for the control group: Books

The results for the control group about books in the Post-test stage showed:

1. Identifies different types of writing: 88.24% of the control group's students are learning how to identify different types of images while 11.76% of them are able to do that.
2. Recognizes a tale from its images: 85.24% of the control group's students are learning how to recognize a tale from its images while 14.71% of them are able to do that.
3. Matches characters to their corresponding tale: 88.24% of the control group's students are learning how to match characters to their corresponding tale while 11.76% of them are able to do that.
4. Reorganizes in chronological order: 85.29% of the control group's students are learning how to reorganize in chronological order while 14.71% of them are able to do that.

### C. 2.3. Environment

	Able	Learning	Unable
Identifies the objects that surround him	14.71%	85.29%	0.00%
Recognizes members of the family	14.71%	85.29%	0.00%
Recognizes good behaviors	14.71%	85.29%	0.00%
Is space oriented/understands spatial concepts	11.76%	88.24%	0.00%

Table 36. Post-test results for the control group: Environment

The results for the control group about environment in the Post-test stage showed the following:

1. Identifies the objects that surround him: 85.29% of the control group's students are learning how to identify the objects that surround them while 14.71% of them are able to do that.
2. Recognizes members of the family: 85.29% of the control group's students are learning how to recognize member of their families while 14.71% of them are able to do that.
3. Recognizes good behaviors: 85.29% of the control group's students are learning how to recognize good behaviors while 14.71% of them are able to do that.
4. Is space oriented/understands spatial concepts: 88.24% of the control group's students are learning to understand spatial concepts while 11.76% of them are unable to do that.

### C. 2.4. Food

	Able	Learning	Unable
Classifies foods according to their particularity	14.71%	85.29%	0.00%
Identifies the ingredients of a recipe	11.76%	88.24%	0.00%
Identifies the source of food	14.71%	85.29%	0.00%
Recognizes healthy food	14.71%	85.29%	0.00%

Table 37. Post-test results for the control group: Food

The results for the control group about food in the Post-test stage showed:

1. Classifies foods according to their particularity: 85.29% of the control group's students are learning how to classify food according to their particularity while 14.71% of them are able to do that.

2. Identifies the ingredients of a recipe: 88.24% of the control group's students are learning how to identify the ingredients of a recipe while 11.76% of them are able to do that.
3. Identifies the source of food: 85.29% of the control group's students are learning how to identify the source of food while 14.71% of them are able to do that.
4. Recognizes healthy food: 85.29% of the control group's students are learning how to reorganize healthy food while 14.71% of them are able to do that.

### C. 2.5. Matching items

	Able	Learning	Unable
Associates identical items	20.59%	79.41%	0.00%
Associates identical shapes	20.59%	79.41%	0.00%
Associates identical colors	20.59%	79.41%	0.00%
Combines elements according to one common characteristic	17.65%	82.35%	0.00%

Table 38. Post-test results for the control group: Matching items

The results for the control group about matching items in the Post-test stage showed the following:

1. Associates identical items: 79.41% of the control group's students are learning how to associate identical items while 20.59% of them are able to do that.
2. Associates identical shapes: 79.41% of the control group's students are learning how to associate identical shapes while 20.59% of them are able to do that.
3. Associates identical colors: 79.41% of the control group's students are learning how to associate identical colors while 23.59% of them are able to do that.
4. Combines elements according to one common characteristic: 82.35% of the control group's students are learning how to combine elements according to one common characteristic while 17.65% of them are able to do that.

### C. 2.6. Series

	Able	Learning	Unable
Finds the odd one out in a series	20.59%	79.41%	0.00%
Completes a series	20.59%	79.41%	0.00%

Table 39. Post-test results for the control group: Linguistic expression/Series

The results for the control group about series (Linguistic expression) in the Post-test stage showed:

1. Finds the odd one out in a series: 79.41% of the control group's students are learning how to find the odd one out in a series while 20.59% of them are able to do that.
2. Completes a series: 79.41% of the control group's students are learning how to complete a series while 20.59% of them are able to do that.

### C. 2.7. Images

	Able	Learning	Unable
Matches a word to an image	20.59%	79.41%	0.00%
Identifies the elements of an image	20.59%	79.41%	0.00%
Identifies images according to their characteristics	20.59%	79.41%	0.00%
Rebuilds an image	20.59%	79.41%	0.00%

Table 40. Post-test results for the control group: Images

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to images which are: Matches a word to an image, Identifies the elements of an image, Identifies images according to their characteristics and Rebuilds an image while 20.59% of the students are able to apply the above skills.

### C. 2.8. Words

	Able	Learning	Unable
Identifies a word	20.59%	79.41%	0.00%
Reconstitutes a word	20.59%	79.41%	0.00%
Associates identical words	17.65%	82.35%	0.00%
Counts the syllables of a word	20.59%	79.41%	0.00%

Table 41. Post-test results for the control group: Words

The results for the control group about words in the Post-test stage showed the following:

1. Identifies a word: 79.41% of the control group's students are learning how to identify a word while 20.59% of them are able to do that.
2. Reconstitutes a word: 79.41% of the control group's students are learning how to reconstitute a word while 20.59% of them are able to do that.
3. Associates identical words: 82.35% of the control group's students are learning how to associate identical words while 17.65% of them are able to do that.
4. Counts the syllables of a word: 79.41% of the control group's students are learning how to count the syllables of a word while 20.59% of them are able to do that.

### C. 3. Sciences

#### C. 3.1. Matching

	Able	Learning	Unable
Associates identical elements	20.59%	79.41%	0.00%
Associates identical colors	20.59%	79.41%	0.00%
Combines elements according to one common characteristic	20.59%	79.41%	0.00%

Table 42. Post-test results for the control group: Matching

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to Matching which are: Associates identical elements, Associates identical colors and Combines elements according to one common characteristic while 20.59% of the students are able to apply the above skills.

### C. 3.2. Numbers

	Able	Learning	Unable
Uses numbers from 1 to 5	20.59%	79.41%	0.00%

Table 43. Post-test results for the control group: Numbers

In the Posttest for the control group, 79.41% of the students are learning how to use numbers from 1 to 5 while 20.59% of them are able to do that.

### C. 3.3. Series

	Able	Learning	Unable
Fills in what is missing	20.59%	79.41%	0.00%
Fills in a repetitive series	20.59%	79.41%	0.00%

Table 44. Post-test results for the control group: Sciences/Series

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to series which are: Fills in what is missing and Fills in a repetitive series while 20.59% of the students are able to apply the above skills.

### C. 3.4. Living

	Able	Learning	Unable
Recognizes the stages of growth	20.59%	79.41%	0.00%
Recognizes living creatures	20.59%	79.41%	0.00%
Identifies the needs of a plant	20.59%	79.41%	0.00%
Respects the environment	20.59%	79.41%	0.00%
Knows the rules of hygiene	20.59%	79.41%	0.00%

Table 45. Post-test results for the control group: Living

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to Living which are: Recognizes the stages of growth, Recognizes living creatures, Identifies the needs of a plant, Respects the environment and Knows the rules of hygiene while 20.59% of the students are able to apply the above skills.



### C. 3.5. Spatial awareness

	Able	Learning	Unable
Spots the location of objects (under, on, in front, behind)	20.59%	79.41%	0.00%
Recognizes the orientation of objects (left, right)	20.59%	79.41%	0.00%

Table 46. Post-test results for the control group: Spatial awareness

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to Spatial awareness which are: Spots the location of objects and Recognizes the orientation of objects while 20.59% of the students are able to apply the above skills.

### C. 3.6. Temporal awareness

	Able	Learning	Unable
Distinguishes the seasons	20.59%	79.41%	0.00%
Reorganizes elements in chronological order	20.59%	79.41%	0.00%

Table 47. Post-test results for the control group: Spatial awareness

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to Temporal awareness which are: Distinguishes the seasons and Reorganizes elements in chronological order while 20.59% of the students are able to apply the above skills.

### C. 3.7. Shapes and sizes

	Able	Learning	Unable
Recognizes basic shapes	20.59%	79.41%	0.00%
Recognizes objects according to their size	20.59%	79.41%	0.00%
Understands the terms many/few	20.59%	79.41%	0.00%

Table 48. Post-test results for the control group: Shapes and sizes

The results for the control group in the Post-test stage showed that 79.41% of the students are learning the skills related to Shapes and sizes which are: Recognizes basic shapes, Recognizes objects according to their size and Understands the terms many/few while 20.59% of the students are able to apply the above skills.

## **D. Post-test results for the experimental group (Using the Tabshoura /kindergarten e-learning platform)**

### **D. 1. Computer**

	Able	Learning	Unable
Has knowledge of basic computer hardware (screen, mouse, keyboard)	94.00%	0.00%	6.00%
Masters drag-and-drop	99.00%	0.00%	1.00%
Masters the click	99.00%	0.00%	1.00%
Locates items on the screen	99.00%	0.00%	1.00%
Spots icons on the homepage	99.00%	0.00%	1.00%

Table 49. Post-test results for the experimental group: Computer

The results for the control group in the Post-test stage showed that 99.00% of the students are able to master drag-and-drop and master the click also they are able to locate items on the screen and to spot icons on the homepage while only 1.00% of the students are unable to apply the above skills.

94.00% of the students have knowledge of basic computer hardware while only 6.00% don't have this knowledge.

### **D. 2. Linguistic Expression**

#### **D. 2.1. Focused listening**

	Able	Learning	Unable
Listens to a story for 5 minutes	97.00%	0.00%	3.00%
Listens to a song for 3 minutes	97.00%	0.00%	3.00%
Listens with the aim of answering comprehension questions	76.00%	21.00%	3.00%

Table 50. Post-test results for the experimental group: Focused listening

The results for the experimental group about focused listening in the Post-test stage showed the following:

1. Listens to a story for 5 minutes: 97.00% of the experimental group students are able to listen to a story for 5 minutes while 3.00% are unable to do that.
2. Listens to a song for 3 minutes: 97.00% of the experimental group students are able to listen to a song for 3 minutes while 3.00% are unable to do that.

3. Listens with the aim of answering comprehension questions: 76.00% of the experimental group students are able to listen and answer comprehension questions, 21.00% are learning how to do that while 3.00% are unable to listen and answer comprehension questions.

#### **D. 2.2. Books**

	Able	Learning	Unable
Identifies different types of writing (recipe, tale, manual)	66.00%	31.00%	3.00%
Recognizes a tale from its images	86.00%	11.00%	3.00%
Matches characters to their corresponding tale	88.00%	9.00%	3.00%
Reorganizes in chronological order	85.00%	12.00%	3.00%

Table 51. Post-test results for the experimental group: Books

The results for the experimental group about books in the Post-test stage showed:

1. Identifies different types of writing: 66.00% of the experimental group's students are able to identify different types of images, 31.00% of them are learning how to do that while 3.00% are unable to identify different types of writing.
2. Recognizes a tale from its images: 86.00% of the experimental group's students are able to recognize a tale from its images, 11.00% of them are learning how to do that while 3.00% are unable to recognize a tale from its images.
3. Matches characters to their corresponding tale: 88.00% of the experimental group's students are able to match characters to their corresponding tale, 9.00% of them are learning how to do that while 3.00% are unable to match characters to their corresponding tale.
4. Reorganizes in chronological order: 85.00% of the control group's students are able to reorganize in chronological order, 12.00% of them are learning how to do that while 3.00% are unable to reorganize in chronological order.

### D. 2.3. Environment

	Able	Learning	Unable
Identifies the objects that surround him	88.00%	9.00%	3.00%
Recognizes members of the family	96.00%	1.00%	3.00%
Recognizes good behaviors	91.00%	6.00%	3.00%
Is space oriented/understands spatial concepts	82.00%	15.00%	3.00%

Table 52. Post-test results for the experimental group: Environment

The results for the experimental group about environment in the Post-test stage showed the following:

1. Identifies the objects that surround him: 88.00% of the experimental group's students are able to identify the objects that surround them, 9.00% of them are learning how to do that while 3.00% are unable to identify the objects that surround them.
2. Recognizes members of the family: 96.00% of the experimental group's students are able to recognize member of their families, 3.00% of them are unable to do that while 1.00% is learning how to recognize members of their families.
3. Recognizes good behaviors: 91.00% of the experimental group's students are able to recognize good behaviors, 6.00% of them are learning how to do that while 3.00% are unable to recognize good behaviors.
4. Is space oriented/understands spatial concepts: 82.00% of the experimental group's students are able to understand spatial concepts, 15.00% of them are learning how to do that while 3.00% are able to understand spatial concepts.

#### D. 2.4. Food

	Able	Learning	Unable
Classifies foods according to their particularity	72.00%	25.00%	3.00%
Identifies the ingredients of a recipe	68.00%	29.00%	3.00%
Identifies the source of food	92.00%	4.00%	4.00%
Recognizes healthy food	95.00%	1.00%	4.00%

Table 53. Post-test results for the experimental group: Food

The results for the experimental group about food in the Post-test stage showed:

1. Classifies foods according to their particularity: 72.00% of the experimental group's students are able to classify food according to their particularity, 25.00% of them are learning how to do that while 3.00% are unable to classify food according to their particularity.
2. Identifies the ingredients of a recipe: 68.00% of the experimental group's students are able to identify the ingredients of a recipe, 29.00% of them are learning how to do that while 3.00% are unable to identify the ingredients of a recipe.
3. Identifies the source of food: 92.00% of the experimental group's students are able to identify the source of food, 4.00% of them are learning how to do that also 4.00% are unable to identify the source of food.
4. Recognizes healthy food: 95.00% of the experimental group's students are able to reorganize healthy food, 4.00% of them are unable to do that while 1.00% is learning how to reorganize healthy food.

### D. 2.5. Matching items

	Able	Learning	Unable
Associates identical items	93.00%	3.00%	4.00%
Associates identical shapes	95.00%	1.00%	4.00%
Associates identical colors	95.00%	1.00%	4.00%
Combines elements according to one common characteristic	59.00%	37.00%	4.00%

Table 54. Post-test results for the experimental group: Matching items

The results for the experimental group about matching items in the Post-test stage showed the following:

1. Associates identical items: 93.00% of the experimental group's students are able to associate identical items, 4.00% of them are unable to do that while 3.00% are learning how to associate identical items.
2. Associates identical shapes: 95.00% of the experimental group's students are able to associate identical shapes, 4.00% are unable to do that while 1.00% is learning how to do that.
3. Associates identical colors: 95.00% of the experimental group's students are able to associate identical colors, 4.00% of them are unable to do that while 1.00% is learning how to do that.
4. Combines elements according to one common characteristic: 59.00% of the experimental group's students are able to combine elements according to one common characteristic, 37.00% of them are learning how to do that while 4.00% are unable to combine elements according to one common characteristic.

### D. 2.6. Series

	Able	Learning	Unable
Finds the odd one out in a series	86.00%	9.00%	5.00%
Completes a series	76.00%	9.00%	15.00%

Table 55. Post-test results for the experimental group: Linguistic expression/Series

The results for the experimental group about series (Linguistic expression) in the Post-test stage showed:

1. Finds the odd one out in a series: 86.00% of the experimental group's students are able to find the odd one out in a series, 9.00% of them are learning how to do that while 5.00% are unable to find the odd one out in a series.
2. Completes a series: 76.00% of the experimental group's students are able to complete a series, 15.00% are unable to do that while 9.00% are learning how to complete a series.

### D. 2.7. Images

	Able	Learning	Unable
Matches a word to an image	63.00%	3.00%	34.00%
Identifies the elements of an image	76.00%	14.00%	10.00%
Identifies images according to their characteristics	75.00%	11.00%	14.00%
Rebuilds an image	78.00%	3.00%	19.00%

Table 56. Post-test results for the experimental group: Images

The results for the experimental group about images in the Post-test stage showed:

1. Matches a word to an image: 63.00% of the experimental group's students are able to match a word to an image, 34.00% of them are unable to do that while 3.00% of are learning how to match a word to an image.
2. Identifies the elements of an image: 76.00% of the experimental group's students are able to identify the elements of an image, 14.00% of them are learning how to do that while 10.00% are unable to identify the elements of an image.
3. Identifies images according to their characteristics: 75.00% of the experimental group's students are able to identify images according to their characteristics,

14.00% of them are unable to do that while 11.00% are learning how to identify images according to their characteristics.

4. Rebuilds an image: 78.00% of the experimental group's students are able to rebuild an image, 19.00% of them are unable to do that while 3.00% are learning how to rebuild an image.

#### **D. 2.8. Words**

	<b>Able</b>	<b>Learning</b>	<b>Unable</b>
<b>Identifies a word</b>	61.00%	4.00%	35.00%
<b>Reconstitutes a word</b>	60.00%	5.00%	35.00%
<b>Associates identical words</b>	59.00%	6.00%	35.00%
<b>Counts the syllables of a word</b>	61.00%	4.00%	35.00%

**Table 57. Post-test results for the experimental group: Words**

The results for the experimental group about words in the Post-test stage showed the following:

1. Identifies a word: 61.00% of the experimental group's students are able to identify a word, 35.00% of them are unable to do that while 4.00% are learning how to do identify a word.
2. Reconstitutes a word: 60.00% of the experimental group's students are able to reconstitute a word, 35.00% of them are unable to do that while 5.00% are learning how to reconstitute a word.
3. Associates identical words: 59.00% of the experimental group's students are able to associates identical words, 35.00% of them are unable to do that while 6.00% are learning how to do that.
4. Counts the syllables of a word: 61.00% of the experimental group's students are unable to count the syllables of a word, 35.00% of them are unable to do that while 4.00% are learning how to do that.



### D. 3. Sciences

#### D. 3.1. Matching

	Able	Learning	Unable
Associates identical elements	78.00%	18.00%	4.00%
Associates identical colors	87.00%	10.00%	3.00%
Combines elements according to one common characteristic	54.00%	42.00%	4.00%

Table 58. Post-test results for the experimental group: Matching

The results for the experimental group about matching in the Post-test stage showed:

1. Associates identical elements: 78.00% of the experimental group's students are able to associate identical elements, 18.00% of them are learning how to do that while 4.00% are unable to associate identical elements.
2. Associates identical colors: 87.00% of the experimental group's students are able to associate identical colors, 10.00% are learning how to do that while 3.00% are unable to associate identical colors.
3. Combines elements according to one common characteristic: 54.00% of the experimental group's students are able to combine elements according to one common characteristic, 42.00% of them are learning how to do that while 4.00% are unable to combine elements according to one common characteristic.

#### D. 3.2. Numbers

	Able	Learning	Unable
Uses numbers from 1 to 5	97.00%	0.00%	3.00%

Table 59. Post-test results for the experimental group: Numbers

In the Posttest for the experimental group, 97.00% of the students are able to use numbers from 1 to 5 while 3.00% of them are unable to do that.

### D. 3.3. Series

	Able	Learning	Unable
Fills in what is missing	95.00%	2.00%	3.00%
Fills in a repetitive series	93.00%	4.00%	3.00%

Table 60. Post-test results for the experimental group: Sciences/Series

The results for the experimental group about series (Sciences) in the Post-test stage showed:

1. Fills in what is missing: 95.00% of the experimental group's students are able to fill in what is missing, 3.00% of them are unable to do that while 2.00% are learning how to fill in what is missing.
2. Fills in a repetitive series: 93.00% of the experimental group's students are able to fill in a repetitive series, 4.00% of them are learning how to do that while 3.00% are unable how to fill in a repetitive series.

### D. 3.4. Living

	Able	Learning	Unable
Recognizes the stages of growth	90.00%	7.00%	3.00%
Recognizes living creatures	93.00%	4.00%	3.00%
Identifies the needs of a plant	97.00%	0.00%	3.00%
Respects the environment	97.00%	0.00%	3.00%
Knows the rules of hygiene	97.00%	0.00%	3.00%

Table 61. Post-test results for the experimental group: Living

The results for the experimental group about Living in the Post-test stage showed the following:

1. Recognizes the stages of growth: 90.00% of the experimental group's students are able to recognize the stages of growth, 7.00% of them are learning how to do that while 3.00% are unable to recognize the stages of growth.
2. Recognizes living creatures: 93.00% of the experimental group's students are able to recognize living creatures, 4.00% of them are learning how to do that while 3.00% are unable to recognize living creatures.
3. Identifies the needs of a plant: 97.00% of the experimental group's students are able to identify the needs of a plant while 3.00% are unable to do that.

4. Respects the environment: 97.00% of the experimental group's students are able to respect the environment while 3.00% of them are unable to do that.
5. Knows the rules of hygiene: 97.00% of the experimental group's students are able to know the rules of hygiene while 3.00% of them are unable to do that.

### **D. 3.5. Spatial awareness**

	Able	Learning	Unable
Spots the location of objects (under, on, in front, behind)	81.00%	16.00%	3.00%
Recognizes the orientation of objects (left, right)	90.00%	7.00%	3.00%

**Table 62. Post-test results for the experimental group: Spatial awareness**

The results for the experimental group about spatial awareness in the Post-test stage showed:

1. Spots the location of objects: 81.00% of the experimental group's students are able to spot the location of objects, 16.00% of them are learning how to do that while 3.00% are unable to spot the location of objects.
2. Recognizes the orientation of objects: 59.00% of the experimental group's students are learning how to recognize the orientation of objects, 30.00% of them are unable to do that while 11.00% are able to recognize the orientation of objects.

### **D. 3.6. Temporal awareness**

	Able	Learning	Unable
Distinguishes the seasons	97.00%	0.00%	3.00%
Reorganizes elements in chronological order	95.00%	2.00%	3.00%

**Table 63. Post-test results for the experimental group: Spatial awareness**

The results for the experimental group about temporal awareness in the Post-test stage showed the following:

1. Distinguishes the seasons: 97.00% of the experimental group's students are able to distinguish the seasons while 3.00% of them are unable to do that.
2. Reorganizes elements in chronological order: 95.00% of the experimental group's students are able to reorganize elements in chronological order while 3.00% of them are unable to do that.

### D. 3.7. Shapes and sizes

	Able	Learning	Unable
Recognizes basic shapes	97.00%	0.00%	3.00%
Recognizes objects according to their size	96.00%	1.00%	3.00%
Understands the terms many/few	96.00%	1.00%	3.00%

Table 64. Post-test results for the experimental group: Shapes and sizes

The results for the experimental group about Living in the Post-test stage showed:

1. Recognizes basic shapes: 97.00% of the experimental group's students are able to recognize basic shapes while 3.00% of them are unable to do that.
2. Recognizes objects according to their size: 96.00% of the experimental group's students are able to recognize objects according to their size, 3.00% of them are unable to do that while 1.00% are learning how to recognize objects according to their size.
3. Understands the terms many/few: 96.00% of the experimental group's students are able to understand the terms many/few, 3.00% are unable to do that while 1.00% are learning how to understands the terms many/few.

## Scores of the questions

This questionnaire was divided into sections; we can calculate the score of each section according to the answers of students.

If the student answered “Able”: His score will be 2.

If the student answered “Learning”: His score will be 1.

If the student answered “Unable”: His score will be 0.

If the section was consisting of 4 questions for example, the students can have a score ranges between 0 and 8.

We can have the total score of each section by adding the score of its questions.

Section		Number of questions	Min score	Max score
<b>Computer</b>		5	0	10
<b>Linguistic Expression</b>	<b>Focused listening</b>	3	0	6
	<b>Books</b>	4	0	8
	<b>Environment</b>	4	0	8
	<b>Food</b>	4	0	8
	<b>Matching items</b>	4	0	8
	<b>Series</b>	2	0	4
	<b>Images</b>	4	0	8
	<b>Words</b>	4	0	8
	<b>Total LE<sup>1</sup></b>	29	0	58
<b>Sciences</b>	<b>Matching</b>	3	0	6
	<b>Numbers</b>	1	0	2
	<b>Series</b>	2	0	4
	<b>Living</b>	5	0	10
	<b>Spatial awareness</b>	2	0	4
	<b>Temporal awareness</b>	2	0	4
	<b>Shapes and sizes</b>	3	0	6
	<b>Total Sciences</b>	18	0	36
<b>General Total<sup>2</sup></b>		<b>52</b>	<b>0</b>	<b>104</b>

Table 65. Score of the questions

<sup>1</sup> LE = Linguistic Expression

<sup>2</sup> General Total = Score of Computer + Score of Linguistic expression + Score of Sciences

**E. Pre-test results for the control group (Not using the Tabshoura /kindergarten e-learning platform)**

Section		Mean	Mode	SD	Min	Max	CV	Mean % <sup>3</sup>
<b>Computer</b>		0.00	0.00	0.00	0.00	0.00	/	0.00%
<b>Linguistic Expression</b>	<b>Focused listening</b>	2.97	3.00	1.42	0.00	6.00	47.96%	49.51%
	<b>Books</b>	3.18	4.00	1.90	0.00	8.00	59.77%	39.71%
	<b>Environment</b>	3.62	4.00	2.00	0.00	8.00	55.29%	45.22%
	<b>Food</b>	2.97	4.00	1.83	0.00	6.00	61.73%	37.13%
	<b>Matching items</b>	4.76	4.00	1.79	3.00	8.00	37.64%	59.56%
	<b>Series</b>	1.53	2.00	1.08	0.00	4.00	70.60%	38.24%
	<b>Images</b>	3.06	4.00	2.09	0.00	8.00	68.26%	38.24%
	<b>Words</b>	0.35	0.00	1.23	0.00	6.00	347.94%	4.41%
	<b>Total LE</b>	22.44	25.00	11.11	4.00	54.00	49.49%	38.69%
<b>Sciences</b>	<b>Matching</b>	3.68	3.00	1.32	2.00	6.00	35.89%	61.27%
	<b>Numbers</b>	1.24	1.00	0.43	1.00	2.00	34.85%	61.76%
	<b>Series</b>	1.62	2.00	1.16	0.00	4.00	71.41%	40.44%
	<b>Living</b>	4.41	5.00	2.40	0.00	9.00	54.42%	44.12%
	<b>Spatial awareness</b>	1.79	2.00	0.77	0.00	4.00	42.91%	44.85%
	<b>Temporal awareness</b>	1.62	2.00	0.92	0.00	4.00	56.97%	40.44%
	<b>Shapes and sizes</b>	3.47	3.00	1.05	2.00	6.00	30.29%	57.84%
	<b>Total Sciences</b>	17.82	18.00	6.78	6.00	35.00	38.06%	49.51%
<b>General Total</b>		<b>40.26</b>	<b>43.00</b>	<b>17.52</b>	<b>11.00</b>	<b>89.00</b>	<b>43.52%</b>	<b>38.72%</b>

Table 66. Scores of the pretest results for the control group

In the above table, we can find many indicators for the analysis but the most important one is the Mean %, this indicator can explain whether the score is acceptable or not.

Usually if the mean was below 50.00% we consider the results unacceptable (weak result).

If the mean was above 50.00% we consider the results acceptable and we can classify the scores as follow:

4. 50% - 60%: Acceptable
5. 61% - 70%: Good
6. 71% - 80%: Very good
7. 81% - 100%: Excellent

The results for the control group in the Pre-test stage showed the following:

<sup>3</sup> Mean % = Mean / Max score of the section

1. Computer: Mean = 0.00%, the result is very weak and the students in the control group don't have any skills or knowledge related to computer.
2. Focused listening: Mean = 49.51%, the result is almost acceptable.
3. Books: Mean = 39.71%, the result is not acceptable below the average.
4. Environment: Mean = 45.22%, the result is not acceptable below the average.
5. Food: Mean = 37.13%, the result is not acceptable below the average.
6. Matching items: Mean = 59.56%, the result is above the average and it's acceptable.
7. Series: Mean = 38.24%, the result is not acceptable below the average.
8. Images: Mean = 38.24%, the result is not acceptable below the average.
9. Words: Mean = 4.41%, the result is very weak below the average.
10. Total Linguistic expression: Mean = 38.69%, the result is not acceptable below the average, the skills of the students about linguistic expression are weak in the pretest stage.
11. Matching (Sciences): Mean = 61.27%, the result is above the average and it's good (Between 61 and 70 %).
12. Numbers: Mean = 61.76%, the result is above the average and it's good (Between 61 and 70 %).
13. Series (Sciences): Mean = 40.44%, the result is not acceptable below the average.
14. Living: Mean = 44.12%, the result is not acceptable below the average.
15. Spatial awareness: Mean = 44.85%, the result is not acceptable below the average.
16. Temporal awareness: Mean = 40.44%, the result is not acceptable below the average.
17. Shapes and sizes: Mean = 57.84%, the result is above the average and it's acceptable.
18. Total sciences: Mean = 49.51%, the result is almost acceptable, the skills of the students about Sciences are somewhat weak in the pretest stage.
19. General total: Mean = 38.72%, the result is not acceptable below the average, the learning skills of the control group students in the pretest are weak.

**F. Pre-test results for the experimental group (Using the Tabshoura /kindergarten e-learning platform)**

Section		Mean	Mode	SD	Min	Max	CV	Mean %
<b>Computer</b>		1.09	0.00	1.98	0.00	5.00	181.67%	10.90%
<b>Linguistic Expression</b>	<b>Focused listening</b>	4.15	5.00	1.64	0.00	6.00	39.55%	69.17%
	<b>Books</b>	2.71	0.00	2.16	0.00	7.00	79.59%	33.88%
	<b>Environment</b>	4.68	7.00	2.60	0.00	8.00	55.66%	58.50%
	<b>Food</b>	3.01	5.00	2.00	0.00	6.00	66.36%	37.63%
	<b>Matching items</b>	4.11	6.00	2.31	0.00	7.00	56.28%	51.38%
	<b>Series</b>	0.90	0.00	0.96	0.00	2.00	106.53%	22.50%
	<b>Images</b>	1.91	0.00	1.58	0.00	4.00	82.90%	23.88%
	<b>Words</b>	0.38	0.00	1.12	0.00	4.00	293.99%	4.75%
	<b>Total LE</b>	21.85	35.00	11.31	0.00	37.00	51.74%	37.67%
<b>Sciences</b>	<b>Matching</b>	2.22	3.00	1.45	0.00	5.00	65.16%	37.00%
	<b>Numbers</b>	1.06	1.00	0.55	0.00	2.00	51.62%	53.00%
	<b>Series</b>	1.14	2.00	0.90	0.00	2.00	78.87%	28.50%
	<b>Living</b>	3.07	4.00	1.89	0.00	6.00	61.64%	30.70%
	<b>Spatial awareness</b>	1.57	2.00	1.15	0.00	4.00	73.13%	39.25%
	<b>Temporal awareness</b>	1.67	2.00	1.15	0.00	3.00	68.65%	41.75%
	<b>Shapes and sizes</b>	2.73	3.00	1.62	0.00	5.00	59.33%	45.50%
	<b>Total Sciences</b>	13.46	19.00	6.77	0.00	24.00	50.29%	37.39%
<b>General Total</b>		<b>36.40</b>	<b>55.00</b>	<b>16.71</b>	<b>0.00</b>	<b>57.00</b>	<b>45.90%</b>	<b>35.00%</b>

Table 67. Scores of the pretest results for the experimental group

The results for the experimental group in the Pre-test stage showed:

20. Computer: Mean = 10.90%, the result is very weak and the students in the experimental group have few skills or knowledge related to computer.
21. Focused listening: Mean = 69.17%, the result is above the average and it's good (Between 61 and 70 %).
22. Books: Mean = 33.88%, the result is not acceptable below the average.
23. Environment: Mean = 58.50%, the result is above the average and it's acceptable.
24. Food: Mean = 37.63%, the result is not acceptable below the average.
25. Matching items: Mean = 51.38%, the result is above the average and it's acceptable.
26. Series: Mean = 22.50%, the result is not acceptable below the average.
27. Images: Mean = 23.88%, the result is not acceptable below the average.



28. Words: Mean = 4.75%, the result is very weak below the average.
29. Total Linguistic expression: Mean = 37.67%, the result is not acceptable below the average, the skills of the students about linguistic expression is weak in the pretest stage.
30. Matching (Sciences): Mean = 37.00%, the result is not acceptable below the average.
31. Numbers: Mean = 53.00%, the result is above the average and it's acceptable.
32. Series (Sciences): Mean = 28.50%, the result is not acceptable below the average.
33. Living: Mean = 30.70%, the result is not acceptable below the average.
34. Spatial awareness: Mean = 39.25%, the result is not acceptable below the average.
35. Temporal awareness: Mean = 41.75%, the result is not acceptable below the average.
36. Shapes and sizes: Mean = 45.50%, the result is not acceptable below the average.
37. Total sciences: Mean = 37.39%, the result is not acceptable below the average, the skills of the students about Sciences is weak in the pretest stage.
38. General total: Mean = 35.00%, the result is not acceptable below the average, the learning skills of the experimental group students in the pretest is weak.

**G. Post-test results for the control group (Not using the Tabshoura /kindergarten e-learning platform)**

Section		Mean	Mode	SD	Min	Max	CV	Mean %
<b>Computer</b>		0.29	0.00	1.19	0.00	5.00	406.02%	2.94%
<b>Linguistic Expression</b>	<b>Focused listening</b>	3.44	3.00	1.08	3.00	6.00	31.34%	57.35%
	<b>Books</b>	4.53	4.00	1.33	4.00	8.00	29.39%	56.62%
	<b>Environment</b>	4.56	4.00	1.37	4.00	8.00	30.16%	56.99%
	<b>Food</b>	4.56	4.00	1.33	4.00	8.00	29.18%	56.99%
	<b>Matching items</b>	4.79	4.00	1.59	4.00	8.00	33.19%	59.93%
	<b>Series</b>	2.41	2.00	0.82	2.00	4.00	34.04%	60.29%
	<b>Images</b>	4.82	4.00	1.64	4.00	8.00	34.04%	60.29%
	<b>Words</b>	4.79	4.00	1.59	4.00	8.00	33.19%	59.93%
	<b>Total LE</b>	33.91	29.00	10.23	29.00	58.00	30.16%	58.47%
<b>Sciences</b>	<b>Matching</b>	3.62	3.00	1.23	3.00	6.00	34.04%	60.29%
	<b>Numbers</b>	1.21	1.00	0.41	1.00	2.00	34.04%	60.29%
	<b>Series</b>	2.41	2.00	0.82	2.00	4.00	34.04%	60.29%
	<b>Living</b>	6.03	5.00	2.05	5.00	10.00	34.04%	60.29%
	<b>Spatial awareness</b>	2.41	2.00	0.82	2.00	4.00	34.04%	60.29%
	<b>Temporal awareness</b>	2.41	2.00	0.82	2.00	4.00	34.04%	60.29%
	<b>Shapes and sizes</b>	3.62	3.00	1.23	3.00	6.00	34.04%	60.29%
	<b>Total Sciences</b>	21.71	18.00	7.39	18.00	36.00	34.04%	60.29%
<b>General Total</b>		<b>55.91</b>	<b>47.00</b>	<b>18.13</b>	<b>47.00</b>	<b>99.00</b>	<b>32.42%</b>	<b>53.76%</b>

Table 68. Scores of the posttest results for the control group

The results for the control group in the Post-test stage showed the following:

1. Computer: Mean = 2.94%, the result is very weak and the students in the control group have very weak skills or knowledge related to computer.
2. Focused listening: Mean = 57.35%, the result is above the average and it's acceptable.
3. Books: Mean = 56.62%, the result is above the average and it's acceptable.
4. Environment: Mean = 56.99%, the result is above the average and it's acceptable.
5. Food: Mean = 56.99%, the result is above the average and it's acceptable.
6. Matching items: Mean = 59.93%, the result is above the average and it's acceptable.
7. Series: Mean = 60.29%, the result is above the average and it's acceptable.

8. Images: Mean = 60.29%, the result is above the average and it's acceptable.
9. Words: Mean = 59.93%, the result is above the average and it's acceptable.
10. Total Linguistic expression: Mean = 58.47%, the result is above the average and it's acceptable, the skills of the students about linguistic expression is acceptable in the posttest stage.
11. Matching (Sciences): Mean = 60.29%, the result is above the average and it's acceptable.
12. Numbers: Mean = 60.29%, the result is above the average and it's acceptable.
13. Series (Sciences): Mean = 60.29%, the result is above the average and it's acceptable.
14. Living: Mean = 60.29%, the result is above the average and it's acceptable.
15. Spatial awareness: Mean = 60.29%, the result is above the average and it's acceptable.
16. Temporal awareness: Mean = 60.29%, the result is above the average and it's acceptable.
17. Shapes and sizes: Mean = 60.29%, the result is above the average and it's acceptable.
18. Total sciences: Mean = 60.29%, the result is above the average and it's acceptable, the skills of the students about Sciences is acceptable in the posttest stage.
19. General total: Mean = 53.76%, the result is acceptable above the average, the learning skills of the control group students in the posttest is acceptable.

## H. Post-test results for the experimental group (Using the Tabshoura /kindergarten e-learning platform)

Section		Mean	Mode	SD	Min	Max	CV	Mean %
<b>Computer</b>		9.80	10.00	1.08	0.00	10.00	11.05%	98.00%
<b>Linguistic Expression</b>	<b>Focused listening</b>	5.61	6.00	1.07	0.00	6.00	19.11%	93.50%
	<b>Books</b>	7.13	8.00	1.72	0.00	8.00	24.06%	89.13%
	<b>Environment</b>	7.45	8.00	1.55	0.00	8.00	20.84%	93.13%
	<b>Food</b>	7.13	8.00	1.62	0.00	8.00	22.70%	89.13%
	<b>Matching items</b>	7.26	8.00	1.61	0.00	8.00	22.20%	90.75%
	<b>Series</b>	3.42	4.00	1.13	0.00	4.00	33.03%	85.50%
	<b>Images</b>	6.15	8.00	2.85	0.00	8.00	46.36%	76.88%
	<b>Words</b>	5.01	8.00	3.77	0.00	8.00	75.30%	62.63%
	<b>Total LE</b>	49.16	58.00	12.41	0.00	58.00	25.25%	84.76%
<b>Sciences</b>	<b>Matching</b>	5.08	6.00	1.29	0.00	6.00	25.44%	84.67%
	<b>Numbers</b>	1.94	2.00	0.34	0.00	2.00	17.67%	97.00%
	<b>Series</b>	3.82	4.00	0.74	0.00	4.00	19.47%	95.50%
	<b>Living</b>	9.59	10.00	1.74	0.00	10.00	18.10%	95.90%
	<b>Spatial awareness</b>	3.65	4.00	0.83	0.00	4.00	22.83%	91.25%
	<b>Temporal awareness</b>	3.86	4.00	0.70	0.00	4.00	18.05%	96.50%
	<b>Shapes and sizes</b>	5.80	6.00	1.04	0.00	6.00	18.01%	96.67%
	<b>Total Sciences</b>	33.74	36.00	6.15	0.00	36.00	18.24%	93.72%
<b>General Total</b>		<b>92.70</b>	<b>104.00</b>	<b>18.00</b>	<b>0.00</b>	<b>104.00</b>	<b>19.42%</b>	<b>89.13%</b>

Table 69. Scores of the posttest results for the experimental group

The results for the experimental group in the Post-test stage showed:

1. Computer: Mean = 98.90%, the result is very high and the students in the experimental group have excellent skills and knowledge related to computer.
2. Focused listening: Mean = 93.50%, the result is very high and excellent (Between 81 and 100 %).
3. Books: Mean = 89.13%, the result is very high and excellent (Between 81 and 100 %).
4. Environment: Mean = 93.13%, the result is very high and excellent (Between 81 and 100 %).
5. Food: Mean = 89.13%, the result is very high and excellent (Between 81 and 100 %).

6. Matching items: Mean = 90.75%, the result is very high and excellent (Between 81 and 100 %).
7. Series: Mean = 85.50%, the result is very high and excellent (Between 81 and 100 %).
8. Images: Mean = 76.88%, the result is high and very good (Between 81 and 100 %).
9. Words: Mean = 62.63%, the result is above the average and it's good (Between 61 and 70 %).
10. Total Linguistic expression: Mean = 84.76%, the result is high and very good (Between 81 and 100 %), the skills of the students about linguistic expression are excellent in the posttest stage.
11. Matching (Sciences): Mean = 84.67%, the result is very high and excellent (Between 81 and 100 %).
12. Numbers: Mean = 97.00%, the result is very high and excellent (Between 81 and 100 %).
13. Series (Sciences): Mean = 95.50%, the result is very high and excellent (Between 81 and 100 %).
14. Living: Mean = 95.90%, the result is very high and excellent (Between 81 and 100 %).
15. Spatial awareness: Mean = 91.25%, the result is very high and excellent (Between 81 and 100 %).
16. Temporal awareness: Mean = 96.50%, the result is very high and excellent (Between 81 and 100 %).
17. Shapes and sizes: Mean = 96.67%, the result is very high and excellent (Between 81 and 100 %).
18. Total sciences: Mean = 93.72%, the result is very high and excellent (Between 81 and 100 %), the skills of the students about Sciences are excellent in the posttest stage.
19. General total: Mean = 89.13%, the result is very high and excellent (Between 81 and 100 %), the learning skills of the experimental group students in the posttest are excellent.

## INFERENCEAL STATISTICS

In this section, we are looking to study the difference between Pre and Post tests for both experimental and control groups with the comparison between the two groups

To study the difference between scores for the same group we used the paired sample t-test (student), it's a parametric test used to compare two means of the same group and to study if the difference is significant or not.

For the comparison between the experimental and control groups (Scores) we used the Independent sample t-test (student), it's a parametric test used to compare two means of different groups and to study if the difference is significant or not.

For the comparison according to the questions, Chi-square test was used, to study the difference between the groups and between phases (Pre and Post)

For the interpretation, we compare Sig (Degree of significance) with  $\alpha$  (error ratio = 5% i.e. 0.05). If  $\text{Sig} > \alpha \rightarrow$  We consider the difference insignificant and vise Versa.

### A. Comparison between Control and Experimental groups for the Pre-test results

#### A. 1. Computer

	Using Tabshoura	Able	Learning	Unable	Sig
Has knowledge of basic computer hardware (screen, mouse, keyboard)	Yes	1.00%	25.00%	74.00%	<b>0.004</b>
	No	0.00%	0.00%	100.00%	
Masters drag-and-drop	Yes	0.00%	20.00%	80.00%	<b>0.005</b>
	No	0.00%	0.00%	100.00%	
Masters the click	Yes	0.00%	20.00%	80.00%	<b>0.005</b>
	No	0.00%	0.00%	100.00%	
Locates items on the screen	Yes	0.00%	21.00%	79.00%	<b>0.004</b>
	No	0.00%	0.00%	100.00%	
Spots icons on the homepage	Yes	0.00%	21.00%	79.00%	<b>0.004</b>
	No	0.00%	0.00%	100.00%	

Table 70. Comparison between Control and Experimental groups for the Pre-test results: Computers

The results for the comparison between control and experimental groups in the pretest about computer showed the following:

1. Has knowledge of basic computer hardware: For the experimental group 74.00% of the students don't have any knowledge of basic computer hardware while the entire control group students don't have this knowledge. (Sig = 0.004 <  $\alpha$  → the difference between the two groups is significant).
2. Masters drag-and-drop: For the experimental group 80.00% of the students cannot master drag-and-drop while the entire control group students cannot do that. (Sig = 0.005 <  $\alpha$  → the difference between the two groups is significant).
3. Masters the click: For the experimental group 80.00% of the students cannot master the click while the entire control group students cannot do that. (Sig = 0.005 <  $\alpha$  → the difference between the two groups is significant).
4. Locates items on the screen: For the experimental group 79.00% of the students cannot locate items on the screen while the entire control group students cannot do that. (Sig = 0.004 <  $\alpha$  → the difference between the two groups is significant).
5. Spots icons on the homepage: For the experimental group 79.00% of the students cannot spot items on the homepage while the entire control group students cannot do that. (Sig = 0.004 <  $\alpha$  → the difference between the two groups is significant).

## A. 2. Linguistic Expression

### A. 2. 1. Focused listening

	Using Tabshoura	Able	Learning	Unable	Sig
Listens to a story for 5 minutes	Yes	64.00%	31.00%	5.00%	<b>0.000</b>
	No	14.70%	76.50%	8.80%	
Listens to a song for 3 minutes	Yes	71.00%	25.00%	4.00%	<b>0.000</b>
	No	14.70%	76.50%	8.80%	
Listens with the aim of answering comprehension questions	Yes	25.00%	39.00%	36.00%	<b>0.012</b>
	No	8.80%	67.60%	23.50%	

Table 71. Comparison between Control and Experimental groups for the Pre-test results: Focused listening

The results for the comparison between control and experimental groups in the pretest about focused listening showed:

1. Listens to a story for 5 minutes: For the experimental group 64.00% of the students are able to listen to a story for 5 minutes while 76.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Listens to a song for 3 minutes: For the experimental group 71.00% of the students are able to listen to a song for 3 minutes while 76.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Listens with the aim of answering comprehension questions: For the experimental group, 39.00% of the students are learning how to listen with the aim of answering comprehension questions also 67.60% of the control group students are learning how to do that. (Sig = 0.012 <  $\alpha$  → the difference between the two groups is significant).



### A. 2. 2. Books

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies different types of writing (recipe, tale, manual)	Yes	25.00%	25.00%	50.00%	<b>0.000</b>
	No	2.90%	73.50%	23.50%	
Recognizes a tale from its images	Yes	11.00%	48.00%	41.00%	0.137
	No	5.90%	67.60%	26.50%	
Matches characters to their corresponding tale	Yes	4.00%	28.00%	68.00%	<b>0.000</b>
	No	2.90%	73.50%	23.50%	
Reorganizes in chronological order	Yes	25.00%	40.00%	35.00%	<b>0.001</b>
	No	2.90%	73.50%	23.50%	

Table 72. Comparison between Control and Experimental groups for the Pre-test results: Books

The results for the comparison between control and experimental groups in the pretest about books showed the following:

1. Identifies different types of writing: 50.00% of the experimental group's students are unable to identify different types of images while 73.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes a tale from its images: 48.00% of the experimental group's students are learning how to recognize a tale from its images and 67.60% of the control group students are learning how to do that. (Sig = 0.137 >  $\alpha$  → the difference between the two groups is not significant).
3. Matches characters to their corresponding tale: 68.00% of the experimental group's students are unable to match characters to their corresponding tale while 73.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Reorganizes in chronological order: 40.00% of the control group's students are learning how to reorganize in chronological order and 73.50% of the control group students are learning how to do that. (Sig = 0.001 <  $\alpha$  → the difference between the two groups is significant).

### A. 2. 3. Environment

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies the objects that surround him	Yes	50.00%	27.00%	23.00%	<b>0.000</b>
	No	14.70%	64.70%	20.60%	
Recognizes members of the family	Yes	58.00%	24.00%	18.00%	<b>0.000</b>
	No	17.60%	73.50%	8.80%	
Recognizes good behaviors	Yes	25.00%	58.00%	17.00%	0.134
	No	8.80%	70.60%	20.60%	
Is space oriented/understands spatial concepts	Yes	25.00%	43.00%	32.00%	<b>0.049</b>
	No	5.90%	58.80%	35.30%	

Table 73. Comparison between Control and Experimental groups for the Pre-test results: Environment

The results for the comparison between control and experimental groups in the pretest about environment showed:

1. Identifies the objects that surround him: 50.00% of the experimental group's students are able to identify the objects that surround them while 64.70% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes members of the family: 58.00% of the experimental group's students are able to recognize member of their families while 73.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Recognizes good behaviors: 58.00% of the experimental group's students are learning how to recognize good behaviors and 70.60% of the control group students are learning how to do that. (Sig = 0.134 >  $\alpha$  → the difference between the two groups is not significant).
4. Is space oriented/understands spatial concepts: 43.00% of the experimental group's students are learning to understand spatial concepts and 58.80% of the control group students are learning how to do that. (Sig = 0.049 <  $\alpha$  → the difference between the two groups is significant).

#### A. 2. 4. Food

	Using Tabshoura	Able	Learning	Unable	Sig
Classifies foods according to their particularity	Yes	28.00%	43.00%	29.00%	<b>0.013</b>
	No	5.90%	67.60%	26.50%	
Identifies the ingredients of a recipe	Yes	3.00%	45.00%	52.00%	0.231
	No	2.90%	61.80%	35.30%	
Identifies the source of food	Yes	1.00%	64.00%	35.00%	0.689
	No	0.00%	70.60%	29.40%	
Recognizes healthy food	Yes	10.00%	65.00%	25.00%	0.399
	No	2.90%	73.50%	23.50%	

Table 74. Comparison between Control and Experimental groups for the Pre-test results: Food

The results for the comparison between control and experimental groups in the pretest about food showed the following:

1. Classifies foods according to their particularity: 43.00% of the experimental group's students are learning how to classify food according to their particularity and 67.60% of the control group students are learning how to do that. (Sig = 0.013 <  $\alpha$  → the difference between the two groups is significant).
2. Identifies the ingredients of a recipe: 52.00% of the experimental group's students are unable to identify the ingredients of a recipe while 61.80% of the control group students are learning how to do that. (Sig = 0.231 >  $\alpha$  → the difference between the two groups is not significant).
3. Identifies the source of food: 64.00% of the experimental group's students are learning how to identify the source of food and 70.60% of the control group students are learning how to do that. (Sig = 0.689 >  $\alpha$  → the difference between the two groups is not significant).
4. Recognizes healthy food: 65.00% of the experimental group's students are learning how to reorganize healthy food and 73.50% of the control group students are learning how to do that. (Sig = 0.399 >  $\alpha$  → the difference between the two groups is not significant).

### A. 2. 5. Matching items

	Using Tabshoura	Able	Learning	Unable	Sig
Associates identical items	Yes	29.00%	53.00%	18.00%	<b>0.012</b>
	No	23.50%	76.50%	0.00%	
Associates identical shapes	Yes	42.00%	39.00%	19.00%	<b>0.000</b>
	No	23.50%	76.50%	0.00%	
Associates identical colors	Yes	42.00%	41.00%	17.00%	<b>0.001</b>
	No	23.50%	76.50%	0.00%	
Combines elements according to one common characteristic	Yes	0.00%	52.00%	48.00%	<b>0.000</b>
	No	20.60%	64.70%	14.70%	

Table 75. Comparison between Control and Experimental groups for the Pre-test results: Matching items

The results for the comparison between control and experimental groups in the pretest about matching items showed:

1. Associates identical items: 53.00% of the experimental group's students are learning how to associate identical items and 76.50% of the control group students are learning how to do that. (Sig = 0.012 <  $\alpha$  → the difference between the two groups is significant).
2. Associates identical shapes: 42.00% of the experimental group's students are able to associate identical shapes while 76.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Associates identical colors: 42.00% of the experimental group's students are able to associate identical colors and 76.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Combines elements according to one common characteristic: 52.00% of the experimental group's students are learning how to combine elements according to one common characteristic and 64.70% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### A. 2. 6. Series

	Using Tabshoura	Able	Learning	Unable	Sig
Finds the odd one out in a series	Yes	0.00%	45.00%	55.00%	<b>0.019</b>
	No	5.90%	55.90%	38.20%	
Completes a series	Yes	0.00%	45.00%	55.00%	<b>0.000</b>
	No	8.80%	67.60%	23.50%	

Table 76. Comparison between Control and Experimental groups for the Pre-test results: Series (Linguistic expression)

The results for the comparison between control and experimental groups in the pretest about series (linguistic expression) showed the following:

1. Finds the odd one out in a series: 55.00% of the experimental group's students are unable to find the odd one out in a series while 55.90% of the control group students are learning how to do that. (Sig = 0.019 <  $\alpha$  → the difference between the two groups is significant).
2. Completes a series: 55.00% of the experimental group's students are unable to complete a series while 67.60% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### A. 2. 7. Images

	Using Tabshoura	Able	Learning	Unable	Sig
Matches a word to an image	Yes	0.00%	19.00%	81.00%	<b>0.000</b>
	No	5.90%	52.90%	41.20%	
Identifies the elements of an image	Yes	20.00%	28.00%	52.00%	<b>0.001</b>
	No	11.80%	64.70%	23.50%	
Identifies images according to their characteristics	Yes	29.00%	29.00%	42.00%	<b>0.000</b>
	No	5.90%	64.70%	29.40%	
Rebuilds an image	Yes	0.00%	17.00%	83.00%	<b>0.000</b>
	No	5.90%	64.70%	29.40%	

Table 77. Comparison between Control and Experimental groups for the Pre-test results: Images

The results for the comparison between control and experimental groups in the pretest about images showed:

1. Matches a word to an image: 81.00% of the experimental group's students are unable to match a word to an image while 52.90% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Identifies the elements of an image: 52.00% of the experimental group's students are unable to identify the elements of an image while 64.70% of the control group students are learning how to do that. (Sig = 0.001 <  $\alpha$  → the difference between the two groups is significant).
3. Identifies images according to their characteristics: 42.00% of the experimental group's students are unable to identify images according to their characteristics while 64.70% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Rebuilds an image: 83.00% of the experimental group's students are unable to rebuild an image while 64.70% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### A. 2. 8. Words

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies a word	Yes	0.00%	11.00%	89.00%	0.088
	No	2.90%	2.90%	94.10%	
Reconstitutes a word	Yes	0.70%	9.00%	90.30%	0.685
	No	0.00%	8.00%	92.00%	
Associates identical words	Yes	0.00%	11.00%	89.00%	0.217
	No	2.90%	8.80%	88.20%	
Counts the syllables of a word	Yes	0.00%	8.00%	92.00%	0.685
	No	0.00%	5.90%	94.10%	

Table 78. Comparison between Control and Experimental groups for the Pre-test results: Words

The results for the comparison between control and experimental groups in the pretest about words showed the following:

1. Identifies a word: 89.00% of the experimental group's students are unable to identify a word and 94.10% of the control group students are learning how to do that. (Sig = 0.088 >  $\alpha$  → the difference between the two groups is not significant).
2. Reconstitutes a word: 90.30% of the experimental group's students are unable to reconstitute a word and 92.00% of the control group students are learning how to do that. (Sig = 0.685 >  $\alpha$  → the difference between the two groups is not significant).
3. Associates identical words: 89.00% of the experimental group's students are unable to associates identical words and 88.20% of the control group students are learning how to do that. (Sig = 0.217 >  $\alpha$  → the difference between the two groups is not significant).
4. Counts the syllables of a word: 92.00% of the experimental group's students are unable to count the syllables of a word and 94.10% of the control group students are learning how to do that. (Sig = 0.685 >  $\alpha$  → the difference between the two groups is not significant).

### A. 3. Sciences

#### A. 3. 1. Matching

	Using Tabshoura	Able	Learning	Unable	Sig
Associates identical elements	Yes	12.00%	63.00%	25.00%	<b>0.003</b>
	No	23.50%	76.50%	0.00%	
Associates identical colors	Yes	12.00%	65.00%	23.00%	<b>0.005</b>
	No	23.50%	76.50%	0.00%	
Combines elements according to one common characteristic	Yes	0.00%	46.00%	54.00%	<b>0.000</b>
	No	23.50%	73.50%	2.90%	

Table 79. Comparison between Control and Experimental groups for the Pre-test results: Matching

The results for the comparison between control and experimental groups in the pretest about matching showed:

1. Associates identical elements: 63.00% of the experimental group's students are learning how to associate identical elements and 76.50% of the control group students are learning how to do that. (Sig = 0.003 <  $\alpha$  → the difference between the two groups is significant).
2. Associates identical colors: 65.00% of the experimental group's students are learning how to associate identical colors and 76.50% of the control group students are learning how to do that. (Sig = 0.005 <  $\alpha$  → the difference between the two groups is significant).
3. Combines elements according to one common characteristic: 54.00% of the experimental group's students are unable to combine elements according to one common characteristic and 73.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).



### A. 3. 2. Numbers

	Using Tabshoura	Able	Learning	Unable	Sig
Uses numbers from 1 to 5	Yes	18.00%	70.00%	12.00%	0.099
	No	23.50%	76.50%	0.00%	

Table 80. Comparison between Control and Experimental groups for the Pre-test results: Numbers

In the pretest for the experimental group, 70.00% of the students are learning how to use numbers from 1 to 5 and 76.50% of the control group students are learning how to do that. (Sig = 0.099 >  $\alpha$  → the difference between the two groups is not significant).

### A. 3. 3. Series

	Using Tabshoura	Able	Learning	Unable	Sig
Fills in what is missing	Yes	0.00%	64.00%	36.00%	<b>0.009</b>
	No	8.80%	64.70%	26.50%	
Fills in a repetitive series	Yes	0.00%	50.00%	50.00%	<b>0.003</b>
	No	8.80%	61.80%	29.40%	

Table 81. Comparison between Control and Experimental groups for the Pre-test results: Series (sciences)

The results for the comparison between control and experimental groups in the pretest about matching showed the following:

1. Fills in what is missing: 64.00% of the experimental group's students are learning how to fill in what is missing and 64.70% of the control group students are learning how to do that. (Sig = 0.009 <  $\alpha$  → the difference between the two groups is significant).
2. Fills in a repetitive series: 50.00% of the experimental group's students are learning how to fill in a repetitive series also the same percentage of students are unable to do that while 61.80% of the control group students are learning how to do that. (Sig = 0.003 <  $\alpha$  → the difference between the two groups is significant).

### A. 3. 4. Living

	Using Tabshoura	Able	Learning	Unable	Sig
Recognizes the stages of growth	Yes	0.00%	46.00%	54.00%	<b>0.000</b>
	No	11.80%	64.70%	23.50%	
Recognizes living creatures	Yes	1.00%	37.00%	62.00%	<b>0.000</b>
	No	8.80%	73.50%	17.60%	
Identifies the needs of a plant	Yes	0.00%	61.00%	39.00%	<b>0.000</b>
	No	20.60%	61.80%	17.60%	
Respects the environment	Yes	9.00%	63.00%	28.00%	0.173
	No	0.00%	73.50%	26.50%	
Knows the rules of hygiene	Yes	5.00%	70.00%	25.00%	0.865
	No	5.90%	73.50%	20.60%	

Table 82. Comparison between Control and Experimental groups for the Pre-test results: Living

The results for the comparison between control and experimental groups in the pretest about living showed:

1. Recognizes the stages of growth: 54.00% of the experimental group's students are unable to recognize the stages of growth while 64.70% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes living creatures: 62.00% of the experimental group's students are unable to recognize living creatures while 73.50% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Identifies the needs of a plant: 61.00% of the experimental group's students are learning how to identify the needs of a plant and 61.80% of the control group students are learning how to do that. (Sig = 0.003 <  $\alpha$  → the difference between the two groups is significant).
4. Respects the environment: 63.00% of the experimental group's students are learning how to respect the environment while 73.50% of the control group students are learning how to do that. (Sig = 0.173 >  $\alpha$  → the difference between the two groups is not significant).

5. Knows the rules of hygiene: 70.00% of the experimental group's students are learning how to know the rules of hygiene while 73.50% of the control group students are learning how to do that. (Sig = 0.865 >  $\alpha$  → the difference between the two groups is not significant).

### A. 3. 5. Spatial awareness

	Using Tabshoura	Able	Learning	Unable	Sig
Spots the location of objects (under, on, in front, behind)	Yes	8.00%	60.00%	32.00%	<b>0.026</b>
	No	2.90%	85.30%	11.80%	
Recognizes the orientation of objects (left, right)	Yes	11.00%	59.00%	30.00%	<b>0.044</b>
	No	2.90%	82.40%	14.70%	

Table 83. Comparison between Control and Experimental groups for the Pre-test results: Spatial awareness

The results for the comparison between control and experimental groups in the pretest about spatial awareness showed the following:

1. Spots the location of objects: 60.00% of the experimental group's students are learning how to spot the location of objects and 85.30% of the control group students are learning how to do that. (Sig = 0.026 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes the orientation of objects: 59.00% of the experimental group's students are learning how to recognize the orientation of objects and 82.40% of the control group students are learning how to do that. (Sig = 0.044 <  $\alpha$  → the difference between the two groups is significant).

### A. 3. 6. Temporal awareness

	Using Tabshoura	Able	Learning	Unable	Sig
Distinguishes the seasons	Yes	30.00%	43.00%	27.00%	<b>0.002</b>
	No	2.90%	73.50%	23.50%	
Reorganizes elements in chronological order	Yes	0.00%	64.00%	36.00%	0.067
	No	2.90%	76.50%	20.60%	

Table 84. Comparison between Control and Experimental groups for the Pre-test results: Temporal awareness

The results for the comparison between control and experimental groups in the pretest about temporal awareness showed:

1. Distinguishes the seasons: 43.00% of the experimental group's students are learning how to distinguish the seasons and 73.50% of the control group students are learning how to do that. (Sig = 0.002 <  $\alpha$  → the difference between the two groups is significant).
2. Reorganizes elements in chronological order: 64.00% of the experimental group's students are learning how to reorganize elements in chronological order and 76.50% of the control group students are learning how to do that. (Sig = 0.067 >  $\alpha$  → the difference between the two groups is not significant).

### A. 3. 7. Shapes and sizes

	Using Tabshoura	Able	Learning	Unable	Sig
Recognizes basic shapes	Yes	29.00%	50.00%	21.00%	<b>0.003</b>
	No	20.60%	79.40%	0.00%	
Recognizes objects according to their size	Yes	29.00%	51.00%	20.00%	<b>0.004</b>
	No	20.60%	79.40%	0.00%	
Understands the terms many/few	Yes	6.00%	44.00%	50.00%	<b>0.000</b>
	No	8.80%	88.20%	2.90%	

Table 85. Comparison between Control and Experimental groups for the Pre-test results: Shapes and sizes

The results for the comparison between control and experimental groups in the pretest about shapes and sizes showed the following:

1. Recognizes basic shapes: 50.00% of the experimental group's students are learning how to recognize basic shapes and 79.40% of the control group students are

learning how to do that. (Sig = 0.003 <  $\alpha$  → the difference between the two groups is significant).

2. Recognizes objects according to their size: 51.00% of the experimental group's students are learning how to recognize objects according to their size and 79.40% of the control group students are learning how to do that. (Sig = 0.004 <  $\alpha$  → the difference between the two groups is significant).
3. Understands the terms many/few: 50.00% of the experimental group's students are unable to understand the terms many/few while 88.20% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

## B. Comparison between Control and Experimental groups for the Post-test results

### B.1. Computer

	Using Tabshoura	Able	Learning	Unable	Sig
Has knowledge of basic computer hardware (screen, mouse, keyboard)	Yes	94.00%	0.00%	6.00%	<b>0.000</b>
	No	0.00%	5.90%	94.10%	
Masters drag-and-drop	Yes	99.00%	0.00%	1.00%	<b>0.000</b>
	No	0.00%	5.90%	94.10%	
Masters the click	Yes	99.00%	0.00%	1.00%	<b>0.000</b>
	No	0.00%	5.90%	94.10%	
Locates items on the screen	Yes	99.00%	0.00%	1.00%	<b>0.000</b>
	No	0.00%	5.90%	94.10%	
Spots icons on the homepage	Yes	99.00%	0.00%	1.00%	<b>0.000</b>
	No	0.00%	5.90%	94.10%	

Table 86. Comparison between Control and Experimental groups for the Post-test results: Computers

The results for the comparison between control and experimental groups in the posttest about computer showed the following:

1. Has knowledge of basic computer hardware: For the experimental group 94.00% of the students have knowledge of basic computer hardware while 94.10% of the control group students don't have this knowledge. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Masters drag-and-drop: For the experimental group 99.00% of the students can master drag-and-drop while 94.10% of the control group students cannot do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Masters the click: For the experimental group 99.00% of the students can master the click while 94.10% of the control group students cannot do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Locates items on the screen: For the experimental group 99.00% of the students cannot locate items on the screen while 94.10% of the control group students cannot do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

## B. 2. Linguistic Expression

### B. 2. 1. Focused listening

	Using Tabshoura	Able	Learning	Unable	Sig
Listens to a story for 5 minutes	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Listens to a song for 3 minutes	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Listens with the aim of answering comprehension questions	Yes	76.00%	21.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	

Table 87. Comparison between Control and Experimental groups for the Post-test results: Focused listening

The results for the comparison between control and experimental groups in the posttest about focused listening showed:

1. Listens to a story for 5 minutes: For the experimental group 97.00% of the students are able to listen to a story for 5 minutes while 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Listens to a song for 3 minutes: For the experimental group 97.00% of the students are able to listen to a song for 3 minutes while 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Listens with the aim of answering comprehension questions: For the experimental group, 76.00% of the students are able to listen with the aim of answering comprehension questions also 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 2. Books

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies different types of writing (recipe, tale, manual)	Yes	66.00%	31.00%	3.00%	<b>0.000</b>
	No	11.80%	88.20%	0.00%	
Recognizes a tale from its images	Yes	86.00%	11.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Matches characters to their corresponding tale	Yes	88.00%	9.00%	3.00%	<b>0.000</b>
	No	11.80%	88.20%	0.00%	
Reorganizes in chronological order	Yes	85.00%	12.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	

Table 88. Comparison between Control and Experimental groups for the Post-test results: Books

The results for the comparison between control and experimental groups in the posttest about books showed the following:

1. Identifies different types of writing: 66.00% of the experimental group's students are able to identify different types of images while 88.20% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes a tale from its images: 86.00% of the experimental group's students are able to recognize a tale from its images and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Matches characters to their corresponding tale: 88.00% of the experimental group's students are able to match characters to their corresponding tale while 88.20% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Reorganizes in chronological order: 85.00% of the control group's students are able to reorganize in chronological order and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).



### B. 2. 3. Environment

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies the objects that surround him	Yes	88.00%	9.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Recognizes members of the family	Yes	96.00%	1.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Recognizes good behaviors	Yes	91.00%	6.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Is space oriented/understands spatial concepts	Yes	82.00%	15.00%	3.00%	<b>0.000</b>
	No	11.80%	88.20%	0.00%	

Table 89. Comparison between Control and Experimental groups for the Post-test results: Environment

The results for the comparison between control and experimental groups in the posttest about environment showed:

1. Identifies the objects that surround him: 88.00% of the experimental group's students are able to identify the objects that surround them while 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes members of the family: 96.00% of the experimental group's students are able to recognize member of their families while 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Recognizes good behaviors: 91.00% of the experimental group's students are able to recognize good behaviors and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Is space oriented/understands spatial concepts: 82.00% of the experimental group's students are able to understand spatial concepts and 88.20% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 4. Food

	Using Tabshoura	Able	Learning	Unable	Sig
Classifies foods according to their particularity	Yes	72.00%	25.00%	3.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Identifies the ingredients of a recipe	Yes	68.00%	29.00%	3.00%	<b>0.000</b>
	No	11.80%	88.20%	0.00%	
Identifies the source of food	Yes	92.00%	4.00%	4.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	
Recognizes healthy food	Yes	95.00%	1.00%	4.00%	<b>0.000</b>
	No	14.70%	85.30%	0.00%	

Table 90. Comparison between Control and Experimental groups for the Post-test results: Food

The results for the comparison between control and experimental groups in the posttest about food showed the following:

1. Classifies foods according to their particularity: 72.00% of the experimental group's students are able to classify food according to their particularity and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Identifies the ingredients of a recipe: 68.00% of the experimental group's students are able to identify the ingredients of a recipe while 88.20% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Identifies the source of food: 92.00% of the experimental group's students are able to identify the source of food and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Recognizes healthy food: 95.00% of the experimental group's students are able to reorganize healthy food and 85.30% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 5. Matching items

	Using Tabshoura	Able	Learning	Unable	Sig
Associates identical items	Yes	93.00%	3.00%	4.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Associates identical shapes	Yes	95.00%	1.00%	4.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Associates identical colors	Yes	95.00%	1.00%	4.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Combines elements according to one common characteristic	Yes	59.00%	37.00%	4.00%	<b>0.000</b>
	No	17.60%	82.40%	0.00%	

Table 91. Comparison between Control and Experimental groups for the Post-test results: Matching items

The results for the comparison between control and experimental groups in the posttest about matching items showed:

1. Associates identical items: 93.00% of the experimental group's students are able to associate identical items while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Associates identical shapes: 95.00% of the experimental group's students are able to associate identical shapes while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Associates identical colors: 95.00% of the experimental group's students are able to associate identical colors and 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Combines elements according to one common characteristic: 59.00% of the experimental group's students are able to combine elements according to one common characteristic and 82.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 6. Series

	Using Tabshoura	Able	Learning	Unable	Sig
Finds the odd one out in a series	Yes	86.00%	9.00%	5.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Completes a series	Yes	76.00%	9.00%	15.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 92. Comparison between Control and Experimental groups for the Post-test results: Series (Linguistic expression)

The results for the comparison between control and experimental groups in the posttest about series (linguistic expression) showed the following:

1. Finds the odd one out in a series: 86.00% of the experimental group's students are able to find the odd one out in a series while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Completes a series: 76.00% of the experimental group's students are able to complete a series while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 7. Images

	Using Tabshoura	Able	Learning	Unable	Sig
Matches a word to an image	Yes	63.00%	3.00%	34.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Identifies the elements of an image	Yes	76.00%	14.00%	10.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Identifies images according to their characteristics	Yes	75.00%	11.00%	14.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Rebuilds an image	Yes	78.00%	3.00%	19.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 93. Comparison between Control and Experimental groups for the Post-test results: Images

The results for the comparison between control and experimental groups in the posttest about images showed:

1. Matches a word to an image: 63.00% of the experimental group's students are able to match a word to an image while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Identifies the elements of an image: 76.00% of the experimental group's students are able to identify the elements of an image while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Identifies images according to their characteristics: 75.00% of the experimental group's students are able to identify images according to their characteristics while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Rebuilds an image: 78.00% of the experimental group's students are able to rebuild an image while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 2. 8. Words

	Using Tabshoura	Able	Learning	Unable	Sig
Identifies a word	Yes	61.00%	4.00%	35.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Reconstitutes a word	Yes	60.00%	5.00%	35.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Associates identical words	Yes	59.00%	6.00%	35.00%	<b>0.000</b>
	No	17.60%	82.40%	0.00%	
Counts the syllables of a word	Yes	61.00%	4.00%	35.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 94. Comparison between Control and Experimental groups for the Post-test results: Words

The results for the comparison between control and experimental groups in the posttest about words showed the following:

1. Identifies a word: 61.00% of the experimental group's students are able to identify a word and 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Reconstitutes a word: 60.00% of the experimental group's students are able to reconstitute a word while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Associates identical words: 59.00% of the experimental group's students are able to associates identical words while 82.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Counts the syllables of a word: 61.00% of the experimental group's students are able to count the syllables of a word while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. Sciences

#### B. 3. 1. Matching

	Using Tabshoura	Able	Learning	Unable	Sig
Associates identical elements	Yes	78.00%	18.00%	4.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Associates identical colors	Yes	87.00%	10.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Combines elements according to one common characteristic	Yes	54.00%	42.00%	4.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 95. Comparison between Control and Experimental groups for the Post-test results: Matching

The results for the comparison between control and experimental groups in the posttest about matching showed:

1. Associates identical elements: 78.00% of the experimental group's students are able to associate identical elements while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Associates identical colors: 87.00% of the experimental group's students are able to associate identical colors while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Combines elements according to one common characteristic: 54.00% of the experimental group's students are able to combine elements according to one common characteristic while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. 2. Numbers

	Using Tabshoura	Able	Learning	Unable	Sig
Uses numbers from 1 to 5	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 96. Comparison between Control and Experimental groups for the Post-test results: Numbers

In the posttest for the experimental group, 97.00% of the students are learning how to use numbers from 1 to 5 while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. 3. Series

	Using Tabshoura	Able	Learning	Unable	Sig
Fills in what is missing	Yes	95.00%	2.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Fills in a repetitive series	Yes	93.00%	4.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 97. Comparison between Control and Experimental groups for the Post-test results: Series (sciences)

The results for the comparison between control and experimental groups in the posttest about matching showed the following:

1. Fills in what is missing: 95.00% of the experimental group's students are able to fill in what is missing while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Fills in a repetitive series: 93.00% of the experimental group's students are able to fill in a repetitive series also the same percentage of students are unable to do that while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).



### B. 3. 4. Living

	Using Tabshoura	Able	Learning	Unable	Sig
Recognizes the stages of growth	Yes	90.00%	7.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Recognizes living creatures	Yes	93.00%	4.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Identifies the needs of a plant	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Respects the environment	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Knows the rules of hygiene	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 98. Comparison between Control and Experimental groups for the Post-test results: Living

The results for the comparison between control and experimental groups in the posttest about living showed:

1. Recognizes the stages of growth: 90.00% of the experimental group's students are able to recognize the stages of growth while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes living creatures: 93.00% of the experimental group's students are able to recognize living creatures while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Identifies the needs of a plant: 97.00% of the experimental group's students are able to identify the needs of a plant and 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
4. Respects the environment: 97.00% of the experimental group's students are able to respect the environment while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

5. Knows the rules of hygiene: 97.00% of the experimental group's students are able to know the rules of hygiene while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. 5. Spatial awareness

	Using Tabshoura	Able	Learning	Unable	Sig
Spots the location of objects (under, on, in front, behind)	Yes	81.00%	16.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Recognizes the orientation of objects (left, right)	Yes	90.00%	7.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 99. Comparison between Control and Experimental groups for the Post-test results: Spatial awareness

The results for the comparison between control and experimental groups in the posttest about spatial awareness showed the following:

1. Spots the location of objects: 81.00% of the experimental group's students are able to spot the location of objects while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes the orientation of objects: 90.00% of the experimental group's students are able to recognize the orientation of objects while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. 6. Temporal awareness

	Using Tabshoura	Able	Learning	Unable	Sig
Distinguishes the seasons	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Reorganizes elements in chronological order	Yes	95.00%	2.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 100. Comparison between Control and Experimental groups for the Post-test results: Temporal awareness

The results for the comparison between control and experimental groups in the posttest about temporal awareness showed:

1. Distinguishes the seasons: 97.00% of the experimental group's students are able to distinguish the seasons while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Reorganizes elements in chronological order: 95.00% of the experimental group's students are able to reorganize elements in chronological order while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

### B. 3. 7. Shapes and sizes

	Using Tabshoura	Able	Learning	Unable	Sig
Recognizes basic shapes	Yes	97.00%	0.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Recognizes objects according to their size	Yes	96.00%	1.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	
Understands the terms many/few	Yes	96.00%	1.00%	3.00%	<b>0.000</b>
	No	20.60%	79.40%	0.00%	

Table 101. Comparison between Control and Experimental groups for the Post-test results: Shapes and sizes

The results for the comparison between control and experimental groups in the posttest about shapes and sizes showed the following:

1. Recognizes basic shapes: 97.00% of the experimental group's students are able to recognize basic shapes while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
2. Recognizes objects according to their size: 96.00% of the experimental group's students are able to recognize objects according to their size while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).
3. Understands the terms many/few: 96.00% of the experimental group's students are able to understand the terms many/few while 79.40% of the control group students are learning how to do that. (Sig = 0.000 <  $\alpha$  → the difference between the two groups is significant).

**C. Comparison of the scores between Pre and Post tests for the control group  
(Not using the Tabshoura /kindergarten e-learning platform)**

Section		Means		% of improvement	Sig	Mean %	
		Pre	Post			Pre	Post
<b>Computer</b>		0.00	0.29	/	0.156	0.00%	2.94%
<b>Linguistic Expression</b>	<b>Focused listening</b>	2.97	3.44	15.84%	0.129	49.51%	57.35%
	<b>Books</b>	3.18	4.53	42.59%	<b>0.001</b>	39.71%	56.62%
	<b>Environment</b>	3.62	4.56	26.02%	<b>0.027</b>	45.22%	56.99%
	<b>Food</b>	2.97	4.56	53.47%	<b>0.000</b>	37.13%	56.99%
	<b>Matching items</b>	4.76	4.79	0.62%	0.943	59.56%	59.93%
	<b>Series</b>	1.53	2.41	57.69%	<b>0.000</b>	38.24%	60.29%
	<b>Images</b>	3.06	4.82	57.69%	<b>0.000</b>	38.24%	60.29%
	<b>Words</b>	0.35	4.79	1258.33%	<b>0.000</b>	4.41%	59.93%
	<b>Total LE</b>	22.44	33.91	51.11%	<b>0.000</b>	38.69%	58.47%
<b>Sciences</b>	<b>Matching</b>	3.68	3.62	-1.60%	0.850	61.27%	60.29%
	<b>Numbers</b>	1.24	1.21	-2.38%	0.774	61.76%	60.29%
	<b>Series</b>	1.62	2.41	49.09%	<b>0.002</b>	40.44%	60.29%
	<b>Living</b>	4.41	6.03	36.67%	<b>0.004</b>	44.12%	60.29%
	<b>Spatial awareness</b>	1.79	2.41	34.43%	<b>0.002</b>	44.85%	60.29%
	<b>Temporal awareness</b>	1.62	2.41	49.09%	<b>0.000</b>	40.44%	60.29%
	<b>Shapes and sizes</b>	3.47	3.62	4.24%	0.598	57.84%	60.29%
	<b>Total Sciences</b>	17.82	21.71	21.78%	<b>0.027</b>	49.51%	60.29%
<b>General Total</b>		<b>40.26</b>	<b>55.91</b>	<b>38.86%</b>	<b>0.001</b>	<b>38.72%</b>	<b>53.76%</b>

Table 102. Comparison of the scores between Pre and Post tests for the control group

The results for the pre and post test for the control group showed the following:

1. Focused listening: The mean of focused listening increased from 49.51% in pretest to 57.35% in posttest with percentage of improvement = 15.84% (Sig = 0.129 >  $\alpha$  → the improvement wasn't significant).
2. Books: The mean of books increased from 39.71% in pretest to 56.62% in posttest with percentage of improvement = 42.59% (Sig = 0.001 <  $\alpha$  → the improvement was significant).
3. Environment: The mean of environment increased from 45.22% in pretest to 56.99% in posttest with percentage of improvement = 26.02% (Sig = 0.027 <  $\alpha$  → the improvement was significant).

4. Food: The mean of food increased from 37.13% in pretest to 56.99% in posttest with percentage of improvement = 53.47% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
5. Matching items: The mean of matching items slightly increased from 59.56% in pretest to 59.93% in posttest with percentage of improvement = 0.62% (Sig = 0.943 >  $\alpha$  → the improvement wasn't significant).
6. Series (Linguistic expression): The mean of series increased from 38.24% in pretest to 60.29% in posttest with percentage of improvement = 57.69% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
7. Images: The mean of images increased from 38.24% in pretest to 60.29% in posttest with percentage of improvement = 57.69% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
8. Words: The mean of words increased from 4.41% in pretest to 59.93% in posttest with percentage of improvement = 1258.33% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
9. Matching: The mean of matching slightly decreased from 61.27% in pretest to 60.29% in posttest with percentage of decline = 1.60% (Sig = 0.850 >  $\alpha$  → the decline wasn't significant).
10. Numbers: The mean of numbers slightly decreased from 61.76% in pretest to 60.29% in posttest with percentage of decline = 2.38% (Sig = 0.774 >  $\alpha$  → the decline wasn't significant).
11. Series (Sciences): The mean of series increased from 40.44% in pretest to 60.29% in posttest with percentage of improvement = 49.09% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
12. Living: The mean of living increased from 44.12% in pretest to 60.29% in posttest with percentage of improvement = 36.67% (Sig = 0.004 <  $\alpha$  → the improvement was significant).
13. Spatial awareness: The mean of spatial awareness increased from 44.85% in pretest to 60.29% in posttest with percentage of improvement = 34.43% (Sig = 0.002 <  $\alpha$  → the improvement was significant).

14. Temporal awareness: The mean of temporal awareness increased from 40.44% in pretest to 60.29% in posttest with percentage of improvement = 49.09% (Sig = 0.000 <  $\alpha$  → the improvement was significant).

15. Shapes and sizes: The mean of shapes and sizes slightly increased from 57.84% in pretest to 60.29% in posttest with percentage of improvement = 4.24% (Sig = 0.598 >  $\alpha$  → the improvement wasn't significant).

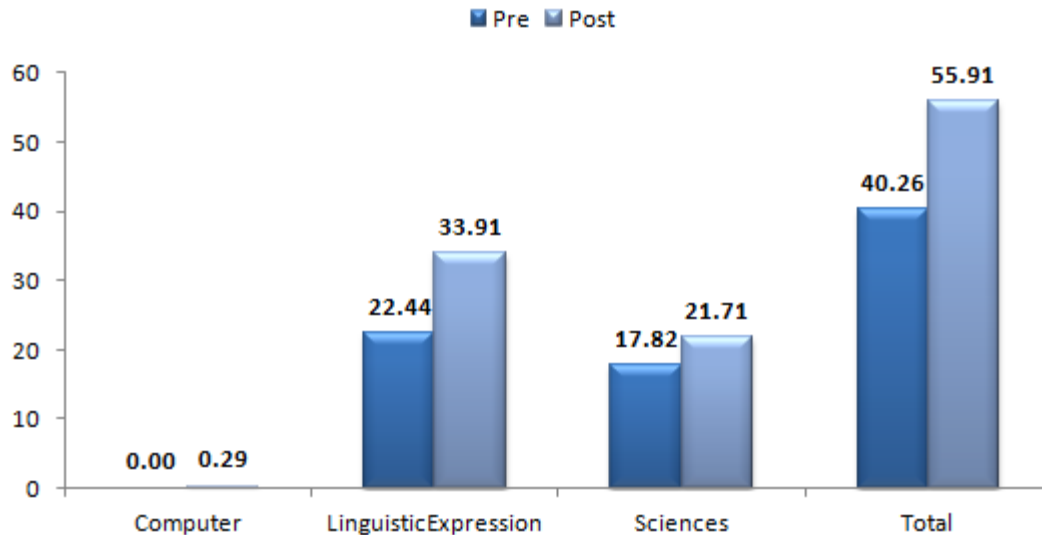


Figure 1. Comparison of the scores between Pre and Post tests for the control group

The results for the pre and post test for the control group in the above figure showed the following:

1. Computer: The mean of computer increased from 0.00 (0.00%) in pretest to 0.29 (2.94%) in posttest (Sig = 0.156 >  $\alpha$  → the improvement wasn't significant).
2. Linguistic expression: The mean of linguistic expression increased from 22.44 (38.69%) in pretest to 33.91 (58.47%) in posttest with percentage of improvement = 51.11% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
3. Sciences: The mean of sciences increased from 17.82 (49.51%) in pretest to 21.71 (60.29%) in posttest with percentage of improvement = 21.78% (Sig = 0.027 <  $\alpha$  → the improvement was significant).

4. General total: The mean of total learning skills increased from 40.26 (38.72%) in pretest to 55.91 (53.76%) in posttest with percentage of improvement = 38.72% (Sig = 0.001 <  $\alpha$  → the improvement was significant).

**D. Comparison of the scores between Pre and Post tests for the experimental group (Using the Tabshoura /kindergarten e-learning platform)**

Section		Means		% of improvement	Sig	Mean %	
		Pre	Post			Pre	Post
<b>Computer</b>		1.09	9.80	799.08%	<b>0.000</b>	10.90%	98.00%
<b>Linguistic Expression</b>	<b>Focused listening</b>	4.15	5.61	35.18%	<b>0.000</b>	69.17%	93.50%
	<b>Books</b>	2.71	7.13	163.10%	<b>0.000</b>	33.88%	89.13%
	<b>Environment</b>	4.68	7.45	59.19%	<b>0.000</b>	58.50%	93.13%
	<b>Food</b>	3.01	7.13	136.88%	<b>0.000</b>	37.63%	89.13%
	<b>Matching items</b>	4.11	7.26	76.64%	<b>0.000</b>	51.38%	90.75%
	<b>Series</b>	0.90	3.42	280.00%	<b>0.000</b>	22.50%	85.50%
	<b>Images</b>	1.91	6.15	221.99%	<b>0.000</b>	23.88%	76.88%
	<b>Words</b>	0.38	5.01	1218.42%	<b>0.000</b>	4.75%	62.63%
	<b>Total LE</b>	21.85	49.16	124.99%	<b>0.000</b>	37.67%	84.76%
<b>Sciences</b>	<b>Matching</b>	2.22	5.08	128.83%	<b>0.000</b>	37.00%	84.67%
	<b>Numbers</b>	1.06	1.94	83.02%	<b>0.000</b>	53.00%	97.00%
	<b>Series</b>	1.14	3.82	235.09%	<b>0.000</b>	28.50%	95.50%
	<b>Living</b>	3.07	9.59	212.38%	<b>0.000</b>	30.70%	95.90%
	<b>Spatial awareness</b>	1.57	3.65	132.48%	<b>0.000</b>	39.25%	91.25%
	<b>Temporal awareness</b>	1.67	3.86	131.14%	<b>0.000</b>	41.75%	96.50%
	<b>Shapes and sizes</b>	2.73	5.80	112.45%	<b>0.000</b>	45.50%	96.67%
	<b>Total Sciences</b>	13.46	33.74	150.67%	<b>0.000</b>	37.39%	93.72%
<b>General Total</b>		<b>36.40</b>	<b>92.70</b>	<b>154.67%</b>	<b>0.000</b>	<b>35.00%</b>	<b>89.13%</b>

Table 103. Comparison of the scores between Pre and Post tests for the experimental group

The results for the pre and post tests for the experimental group showed the following:

1. Focused listening: The mean of focused listening increased from 69.17% in pretest to 93.50% in posttest with percentage of improvement = 35.18% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
2. Books: The mean of books increased from 33.88% in pretest to 89.13% in posttest with percentage of improvement = 163.10% (Sig = 0.000 <  $\alpha$  → the improvement was significant).



3. Environment: The mean of environment increased from 58.50% in pretest to 93.13% in posttest with percentage of improvement = 59.19% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
4. Food: The mean of food increased from 37.63% in pretest to 89.13% in posttest with percentage of improvement = 136.88% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
5. Matching items: The mean of matching items increased from 51.38% in pretest to 90.75% in posttest with percentage of improvement = 76.64% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
6. Series (Linguistic expression): The mean of series increased from 22.50% in pretest to 85.50% in posttest with percentage of improvement = 280.00% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
7. Images: The mean of images increased from 23.88% in pretest to 76.88% in posttest with percentage of improvement = 221.99% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
8. Words: The mean of words increased from 4.75% in pretest to 62.63% in posttest with percentage of improvement = 1218.42% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
9. Matching: The mean of matching increased from 37.00% in pretest to 84.67% in posttest with percentage of improvement = 128.83% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
10. Numbers: The mean of numbers increased from 53.00% in pretest to 97.00% in posttest with percentage of decline = 83.02% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
11. Series (Sciences): The mean of series increased from 28.50% in pretest to 95.50% in posttest with percentage of improvement = 235.09% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
12. Living: The mean of living increased from 30.70% in pretest to 95.90% in posttest with percentage of improvement = 212.38% (Sig = 0.000 <  $\alpha$  → the improvement was significant).

13. Spatial awareness: The mean of spatial awareness increased from 39.25% in pretest to 91.25% in posttest with percentage of improvement = 132.48% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
14. Temporal awareness: The mean of temporal awareness increased from 41.75% in pretest to 96.50% in posttest with percentage of improvement = 131.14% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
15. Shapes and sizes: The mean of shapes and sizes slightly increased from 45.50% in pretest to 96.67% in posttest with percentage of improvement = 112.45% (Sig = 0.000 <  $\alpha$  → the improvement was significant).

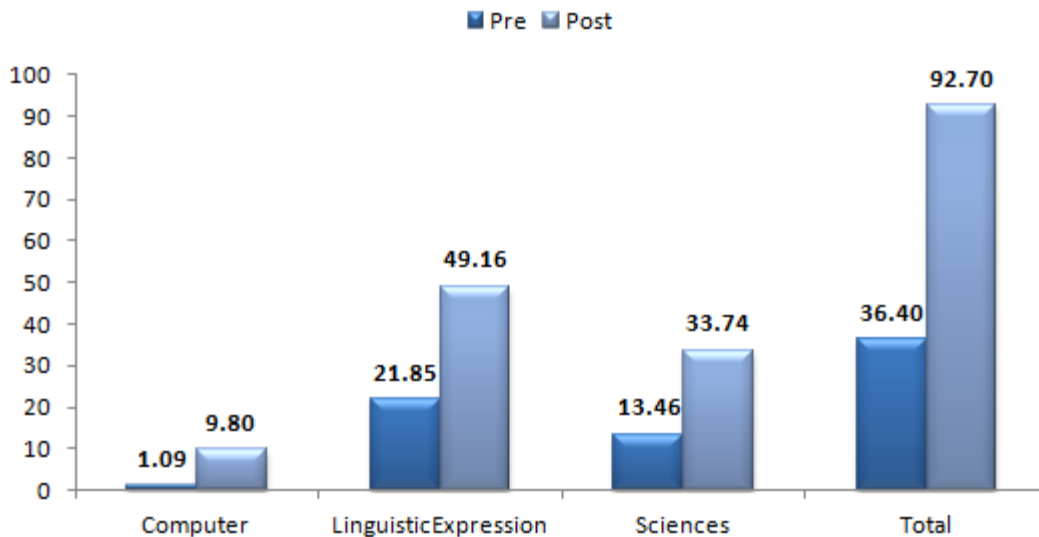


Figure 2. Comparison of the scores between Pre and Post tests for the experimental group

The results for the pre and post test for the control group in the above figure showed the following:

1. Computer: The mean of computer increased from 1.09 (10.90%) in pretest to 9.80 (98.00%) in posttest with percentage of improvement = 799.08% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
2. Linguistic expression: The mean of linguistic expression increased from 21.85 (37.67%) in pretest to 49.16 (84.76%) in posttest with percentage of improvement = 124.99% (Sig = 0.000 <  $\alpha$  → the improvement was significant).

3. Sciences: The mean of sciences increased from 13.46 (37.39%) in pretest to 33.74 (93.72%) in posttest with percentage of improvement = 150.67% (Sig = 0.000 <  $\alpha$  → the improvement was significant).
4. General total: The mean of total learning skills increased from 36.40 (35.00%) in pretest to 92.70 (89.13%) in posttest with percentage of improvement = 154.67% (Sig = 0.000 <  $\alpha$  → the improvement was significant).

### E. Comparison of the scores between Control and Experimental groups for the Post-test results

Section		Using Tabshoura		% of difference	Sig	Mean %	
		Yes	No			Pre	Post
<b>Computer</b>		9.80	0.29	97.00%	<b>0.000</b>	98.00%	2.94%
<b>Linguistic Expression</b>	<b>Focused listening</b>	5.61	3.44	38.66%	<b>0.000</b>	93.50%	57.35%
	<b>Books</b>	7.13	4.53	36.47%	<b>0.000</b>	89.13%	56.62%
	<b>Environment</b>	7.45	4.56	38.81%	<b>0.000</b>	93.13%	56.99%
	<b>Food</b>	7.13	4.56	36.06%	<b>0.000</b>	89.13%	56.99%
	<b>Matching items</b>	7.26	4.79	33.97%	<b>0.000</b>	90.75%	59.93%
	<b>Series</b>	3.42	2.41	29.48%	<b>0.000</b>	85.50%	60.29%
	<b>Images</b>	6.15	4.82	21.57%	<b>0.011</b>	76.88%	60.29%
	<b>Words</b>	5.01	4.79	4.31%	0.747	62.63%	59.93%
	<b>Total LE</b>	49.16	33.91	31.02%	<b>0.000</b>	84.76%	58.47%
<b>Sciences</b>	<b>Matching</b>	5.08	3.62	28.79%	<b>0.000</b>	84.67%	60.29%
	<b>Numbers</b>	1.94	1.21	37.84%	<b>0.000</b>	97.00%	60.29%
	<b>Series</b>	3.82	2.41	36.86%	<b>0.000</b>	95.50%	60.29%
	<b>Living</b>	9.59	6.03	37.13%	<b>0.000</b>	95.90%	60.29%
	<b>Spatial awareness</b>	3.65	2.41	33.92%	<b>0.000</b>	91.25%	60.29%
	<b>Temporal awareness</b>	3.86	2.41	37.52%	<b>0.000</b>	96.50%	60.29%
	<b>Shapes and sizes</b>	5.80	3.62	37.63%	<b>0.000</b>	96.67%	60.29%
	<b>Total Sciences</b>	33.74	21.71	35.67%	<b>0.000</b>	93.72%	60.29%
<b>General Total</b>		<b>92.70</b>	<b>55.91</b>	<b>39.69%</b>	<b>0.000</b>	<b>89.13%</b>	<b>53.76%</b>

Table 104. Comparison of the posttest scores between Control and experimental groups

The results of the posttest scores for the control and the experimental groups showed:

1. Focused listening: The mean of focused listening for the experimental group = 98.00% while it's equal to 2.94% for the control group, percentage of difference = 97.00% (Sig = 0.000 <  $\alpha$  → the difference was significant).
2. Books: The mean of books for the experimental group = 89.13% while it's equal to 56.62% for the control group, percentage of difference = 36.47% (Sig = 0.000 <  $\alpha$  → the difference was significant).
3. Environment: The mean of environment for the experimental group = 93.13% while it's equal to 56.99% for the control group, percentage of difference = 38.81% (Sig = 0.000 <  $\alpha$  → the difference was significant).

4. Food: The mean of food for the experimental group = 89.13% while it's equal to 56.99% for the control group, percentage of difference = 36.06% (Sig = 0.000 <  $\alpha$  → the difference was significant).
5. Matching items: The mean of matching items for the experimental group = 90.75% while it's equal to 59.93% for the control group, percentage of difference = 33.97% (Sig = 0.000 <  $\alpha$  → the difference was significant).
6. Series (Linguistic expression): The mean of series for the experimental group = 85.50% while it's equal to 60.29% for the control group, percentage of difference = 29.48% (Sig = 0.000 <  $\alpha$  → the difference was significant).
7. Images: The mean of images for the experimental group = 76.88% while it's equal to 60.29% for the control group, percentage of difference = 21.57% (Sig = 0.000 <  $\alpha$  → the difference was significant).
8. Words: The mean of words for the experimental group = 62.63% while it's equal to 59.93% for the control group, percentage of difference = 4.31% (Sig = 0.747 >  $\alpha$  → the difference wasn't significant).
9. Matching: The mean of matching for the experimental group = 84.76% while it's equal to 60.29% for the control group, percentage of difference = 28.79% (Sig = 0.000 <  $\alpha$  → the difference was significant).
10. Numbers: The mean of numbers for the experimental group = 97.00% while it's equal to 60.29% for the control group, percentage of difference = 37.84% (Sig = 0.000 <  $\alpha$  → the difference was significant).
11. Series (Sciences): The mean of series for the experimental group = 95.50% while it's equal to 60.29% for the control group, percentage of difference = 36.86% (Sig = 0.000 <  $\alpha$  → the difference was significant).
12. Living: The mean of living for the experimental group = 95.90% while it's equal to 60.29% for the control group, percentage of difference = 37.13% (Sig = 0.000 <  $\alpha$  → the difference was significant).
13. Spatial awareness: The mean of spatial awareness for the experimental group = 91.25% while it's equal to 60.29% for the control group, percentage of difference = 33.92% (Sig = 0.000 <  $\alpha$  → the difference was significant).

14. Temporal awareness: The mean of temporal awareness for the experimental group = 96.50% while it's equal to 60.29% for the control group, percentage of difference = 37.52% (Sig = 0.000 <  $\alpha$  → the difference was significant).

15. Shapes and sizes: The mean of shapes and sizes for the experimental group = 96.67% while it's equal to 60.29% for the control group, percentage of difference = 37.63% (Sig = 0.000 <  $\alpha$  → the difference was significant).

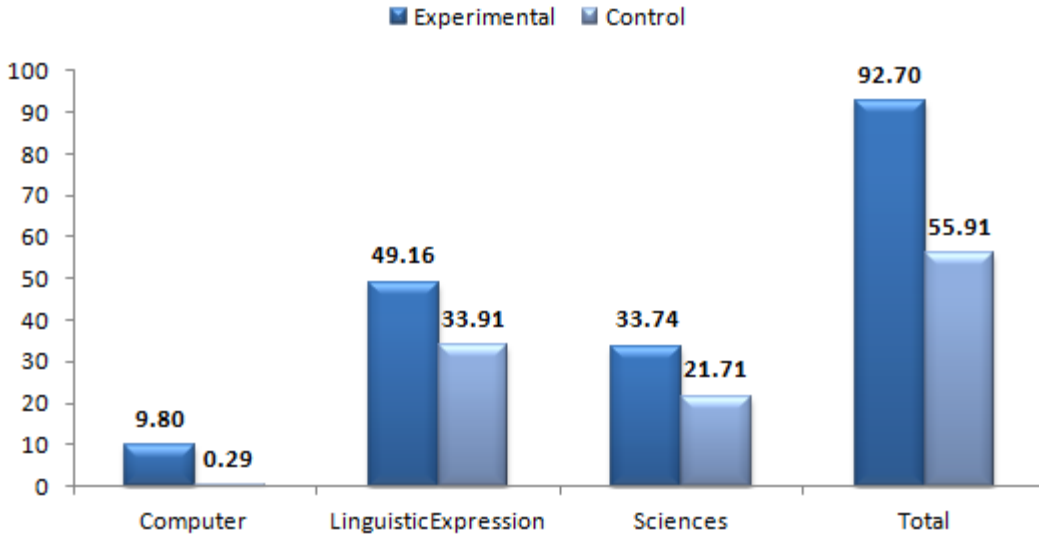


Figure 3. Comparison of the posttest scores between Control and experimental groups

The results of the posttest scores for the control and the experimental groups in the above figure showed the following:

1. Computer: The mean of computer for the experimental group = 98.00% while it's equal to 2.94% for the control group, percentage of difference = 97.00% (Sig = 0.000 <  $\alpha$  → the difference was significant).
2. Linguistic expression: The mean of linguistic expression for the experimental group = 84.76% while it's equal to 58.47% for the control group, percentage of difference = 31.02% (Sig = 0.000 <  $\alpha$  → the difference was significant).
3. Sciences: The mean of sciences for the experimental group = 93.72% while it's equal to 60.29% for the control group, percentage of difference = 35.67% (Sig = 0.000 <  $\alpha$  → the difference was significant).

4. General total: The mean of total learning skills for the experimental group = 89.13% while it's equal to 53.76% for the control group, percentage of difference = 36.69% (Sig = 0.000 <  $\alpha$  → the difference was significant).

## CONCLUSION

Comparing the results of the pretests and posttests of control and experimental groups (table 105), it is concluded that the control group has a mean of 40.26 on the total measurements items in the pretest, as they showed that they are unable in computer, linguistic expression and sciences, whereby they showed a null ability in computer. Whereas the experimental group has a mean of 36.4 on the total measurement items of the pretest, the results indicate that students are unable in computer, linguistic expression and sciences, whereby the lowest score is for computer. The control group scored better in their pretests than the experimental group.

Having a look on the posttest of both groups, the posttest scores of the control group indicated that the students improved in “linguistic expression” as they significantly improved in “words”, while they slightly improved in “sciences” and did not show improvement in “computer” and slightly dropped in “numbers”. Students of the control group, who received their learning in a traditional approach, had a 38.86% total improvement, which is considered as a slight improvement. However, the scores of the posttest of the experimental group indicated that students improved significantly in all items of computer, linguistic expression, and sciences, whereby the most significant improvement was in the scores for “words”. Students of the experimental group, who received their learning via tabshoura e-learning platform, had a 154.67% total improvement, which is considered as a very significant improvement.

The students of the experimental group showed a higher level of significant improvement than the students of the control group, as the control group students moved from “unable” stage to “learning” stage whereas the students of the experimental group moved from being “Unable” to being “Able”. This outcome implies that tabshoura e-learning contributed in significantly improving and developing skills and knowledge of students in computer, linguistic expression, and sciences. Therefore, this study reinforces the importance of using tabshoura e-learning platform in providing better learning to students in kindergarten.



		Control group				Experimental group			
		Pretest	Posttest	% of improv	Sig	Pretest	Posttest	% of improv	Sig
Section		Mean	Mean			Mean	Mean		
<b>Computer</b>		0	0.29	/	0.156	1.09	9.8	799.08%	<b>0.0</b>
<b>Linguistic Expression</b>	<b>Focused listening</b>	2.97	3.44	15.84%	0.129	4.15	5.61	35.18%	<b>0.0</b>
	<b>Books</b>	3.18	4.53	42.59%	<b>0.001</b>	2.71	7.13	163.10%	<b>0.0</b>
	<b>Environment</b>	3.62	4.56	26.02%	<b>0.027</b>	4.68	7.45	59.19%	<b>0.0</b>
	<b>Food</b>	2.97	4.56	53.47%	<b>0</b>	3.01	7.13	136.88%	<b>0.0</b>
	<b>Matching items</b>	4.76	4.79	0.62%	0.943	4.11	7.26	76.64%	<b>0.0</b>
	<b>Series</b>	1.53	2.41	57.69%	<b>0</b>	0.9	3.42	280.00%	<b>0.0</b>
	<b>Images</b>	3.06	4.82	57.69%	<b>0</b>	1.91	6.15	221.99%	<b>0.0</b>
	<b>Words</b>	0.35	4.79	1258.33%	<b>0</b>	0.38	5.01	1218.42%	<b>0.0</b>
	<b>Total LE</b>	22.44	33.91	51.11%	<b>0</b>	21.85	49.16	124.99%	<b>0.0</b>
<b>Sciences</b>	<b>Matching</b>	3.68	3.62	-1.60%	0.85	2.22	5.08	128.83%	<b>0.0</b>
	<b>Numbers</b>	1.24	1.21	-2.38%	0.774	1.06	1.94	83.02%	<b>0.0</b>
	<b>Series</b>	1.62	2.41	49.09%	<b>0.002</b>	1.14	3.82	235.09%	<b>0.0</b>
	<b>Living</b>	4.41	6.03	36.67%	<b>0.004</b>	3.07	9.59	212.38%	<b>0.0</b>
	<b>Spatial awareness</b>	1.79	2.41	34.43%	<b>0.002</b>	1.57	3.65	132.48%	<b>0.0</b>
	<b>Temporal awareness</b>	1.62	2.41	49.09%	<b>0</b>	1.67	3.86	131.14%	<b>0.0</b>
	<b>Shapes and sizes</b>	3.47	3.62	4.24%	0.598	2.73	5.8	112.45%	<b>0.0</b>
	<b>Total Sciences</b>	17.82	21.71	21.78%	<b>0.027</b>	13.46	33.74	150.67%	<b>0.0</b>
<b>General Total</b>		<b>40.26</b>	<b>55.91</b>	<b>38.86%</b>	<b>0.001</b>	<b>36.4</b>	<b>92.7</b>	<b>154.67%</b>	<b>0.0</b>

Table 105. Comparison between scores and percentage of improvement between control and experimental groups

## RECOMMENDATIONS

The study showed that “Tabshoura e-learning platform” has a positive effect on kindergarten students learning as it improved their knowledge and skills in computer, linguistic expression and sciences. Therefore, it is recommended to promote this platform in schools as a mean to provide better learning experience and improvement in students’ achievements.

This study would serve as a base study for other expanded studies that would include higher grades’ students not only the kindergarten students in order to examine the benefit of this platform on students of higher grades.

Some issues in research design should be taken in consideration such as the proportional number of students that are participating in both groups as the students in the experimental group significantly outnumbered the students of the control group, in order to provide better credibility and reliability of the results.

The findings of this study could not be generalized as the sample of participants is considered as relatively small in order to make definite and generalized conclusions; hence, testing on bigger sample is needed to confirm results.

In order to rely on the results, there should be an investigation to examine whether there are other factors, not related to the intervention, did not affect the outcomes, for example: the characteristics of the chosen sample of both groups.

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