Report on the Impact of "Science Safari with Dr. Ama"

Check_out_pictures from event:https://drive.google.com/drive/folders/1XV-4zpaDts8uinVZSpMiQVfRv6J8YToG?usp=drive_link

Introduction

In our effort to enhance science education through innovative methods, we conducted a study using the educational game "Science Safari with Dr. Ama." The primary goal was to assess the game's effectiveness in improving students' understanding of photosynthesis. This report provides a summary of the methodology, data analysis, and findings from the study conducted across various schools in the Ashanti and Eastern Regions of Ghana.

Methodology

Participants: A total of 183 students from multiple primary schools participated in the study. The breakdown is as follows:

- **Ashanti Region (Bonsec Standard, Obuasi):** 94 students
- **Eastern Region (Akyemansa district towns involved: Akim Ofoase, Akim Bontodiase, Asuboa, Anyinase, Kyirimankani and Akim Brenase):** 89 students from six schools
    - Pinoko Educational Complex
    - Adventist Preparatory School
    - Ofoase R/C Primary (A)
    - Bontodiase Methodist B/A
    - Bontodiase Presby B/A
    - Asuboa North R/C Primary
    - Kyirimankani Sky High D/A Primary
    - Anyinase Presby B/A
    - Anyinase Adabiya Islamic
    - Anyinase R/C Primary B
    - Anyinase R/C A Basic School

Procedure:

1. Students were taught photosynthesis in the traditional way.
2. They took a pre-game quiz to assess their initial understanding.
3. They played the "Science Safari with Dr. Ama" game.
4. They took a post-game quiz to measure any changes in their understanding.

Data Collection:

- Scores from both the pre-game and post-game quizzes were recorded and analyzed.

Data Analysis

Descriptive Statistics:

	Pre-game score	Post-game score
Mean	4.49	5.85
Standard Deviation	1.49	1.27

The average pre-game score recorded is 4.49 out of a possible maximum score of 7. The mean post-game score is 5.85, which is higher than the pre-game mean, suggesting that on average, students scored higher after playing the game. The standard deviation for the post-game scores is slightly lower, indicating a consistent improvement across the students.

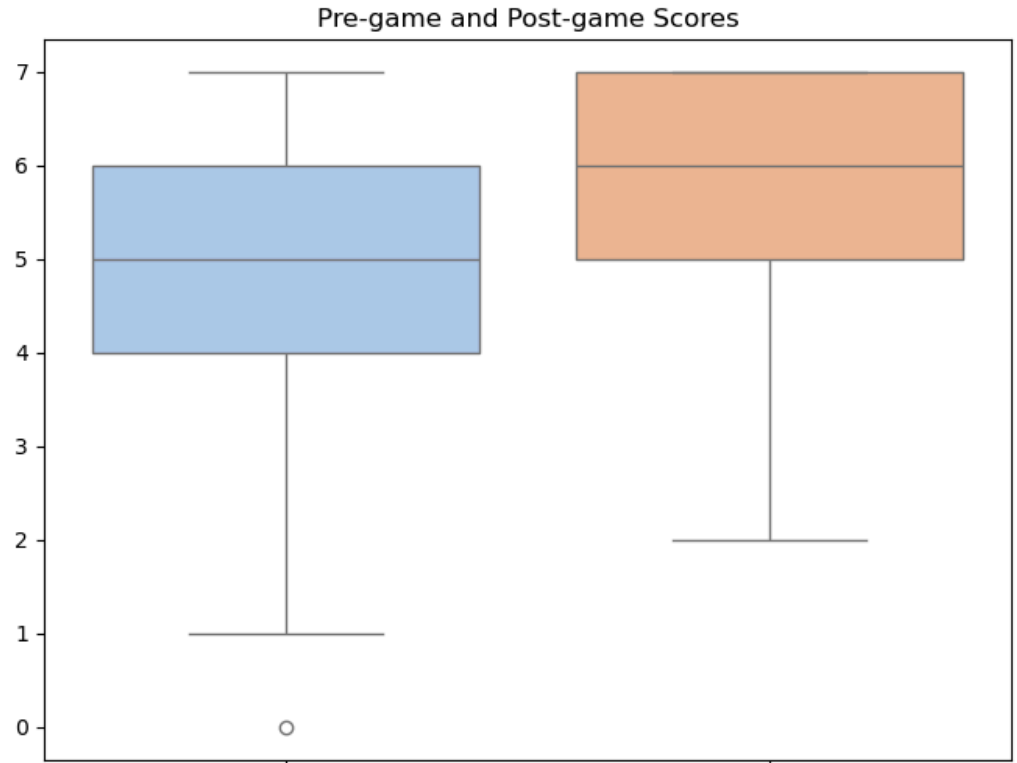
Statistical Tests

T-test	p-value	Effect Size (Cohen's d)
-13.91	0.0000	0.96

The T-statistic of -14.83 indicates a significant difference between pre-game and post-game scores. The p-value of 0.0000 confirms that this difference is statistically significant. Cohen's d of 0.98 indicates a large effect size, meaning the game had a substantial impact on improving students' scores.

Visual Analysis

Box Plot Interpretation:



Pre-game Scores:

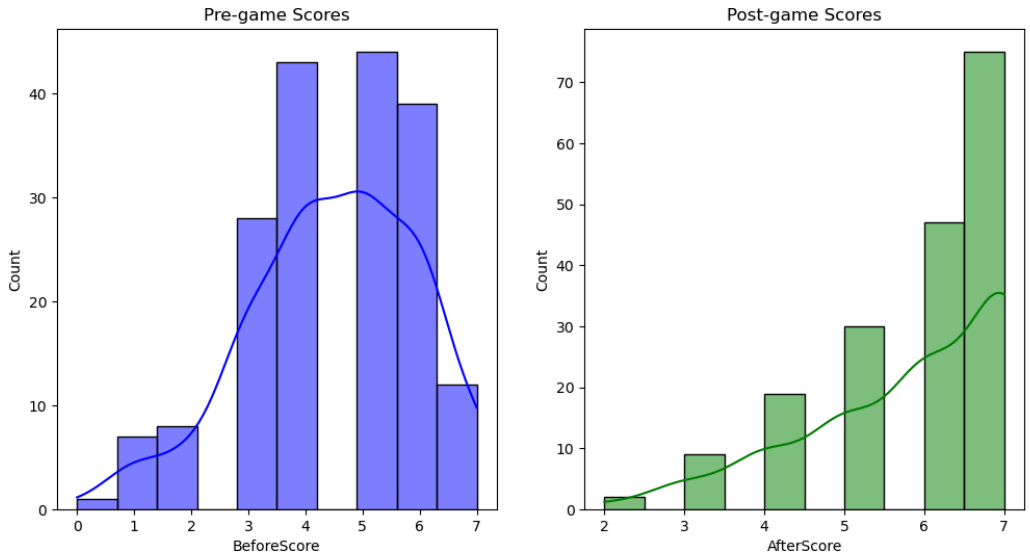
- The median pre-game score is around 5.
- The interquartile range (IQR) shows that the middle 50% of the scores lie between approximately 4 and 6.
- The whiskers indicate that most scores range between 1 and 7.
- There are no significant outliers in the pre-game scores.

Post-game Scores*:*

- The median post-game score is around 6.
- The IQR for post-game scores shows that the middle 50% of scores lie between approximately 5 and 7.
- The whiskers indicate that most scores range between 2 and 7.
- There are no significant outliers in the post-game scores.

The median post-game score was higher than the pre-game score, indicating an overall improvement.

Histogram Interpretation:



Pre-game Scores:

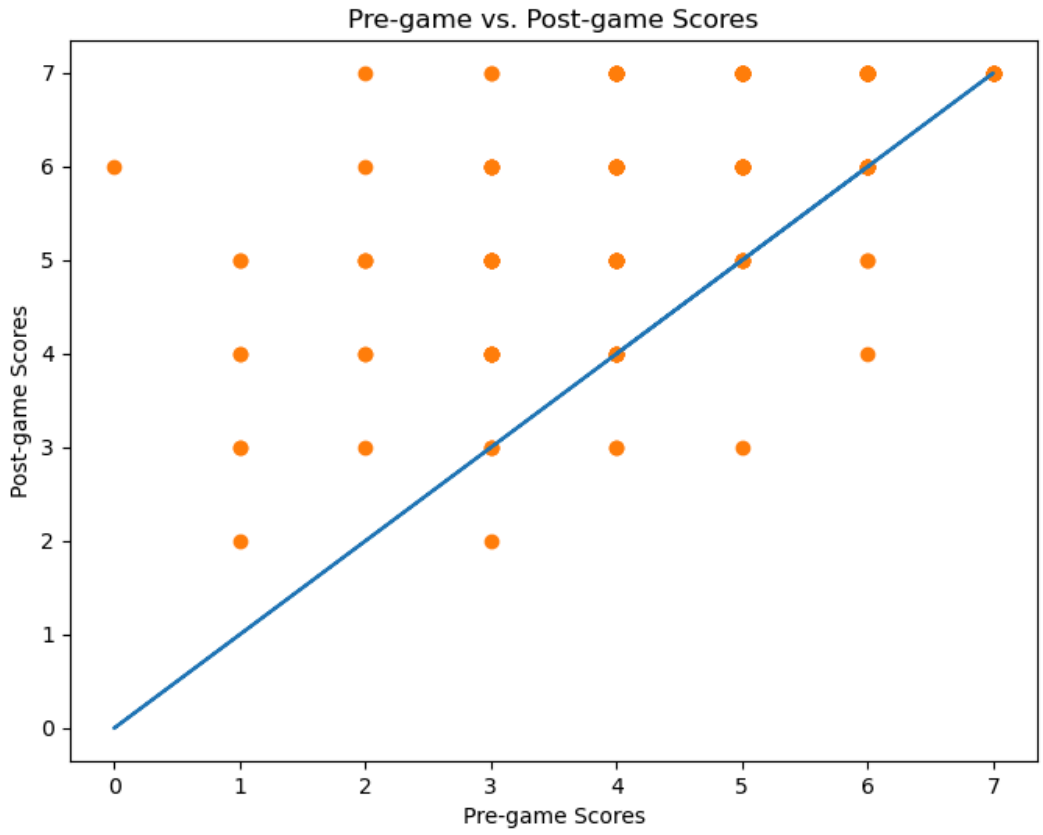
- Most scores clustered around 4 to 6

Post-game Scores:

- Most scores shifted higher, clustering around 6 to 7

The histograms illustrate the distribution of pre-game and post-game scores. Before playing the game, most scores were clustered around 4 to 6. After playing the game, the scores shifted higher, clustering around 6 to 7 and showing a more balanced distribution with fewer low scores.

Scatter Plot



Interpretation:

The scatter plot of pre-game vs. post-game scores reveals a positive correlation between the two sets of scores, with a trend line indicating that higher pre-game scores generally correspond to higher post-game scores. This correlation suggests that students who performed well initially also tended to improve after the

intervention.Although there were some students who performed poorly after the intervention.

Conclusion

The study's findings demonstrate that "Science Safari with Dr. Ama" effectively enhances students' understanding of photosynthesis. The significant increase in mean scores, large effect size, and statistical significance of the results provide strong evidence of the game's educational value. This game shows promise as an effective tool for improving science education among primary school students.