

# AUGMENTED REALITY TEACHING AND LEARNING: CORRELATION BETWEEN THE STUDENTS' ACADEMIC PERFORMANCE AND THEIR ATTITUDE TOWARDS BIOLOGY

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## 1 INTRODUCTION



One of the most powerful forms of contextual mobile learning is **Augmented Reality (AR)**. AR learning is increasingly finding its place in the field of education with its potentials to improve students' learning performance and **attitude**. While AR has been used in other countries, the documented use in the Philippines is scarce.



AR offers opportunities to expand the borders of the classroom to create new dimensions in **mobile learning** and to increase the students' connection to the real world and to the concepts being learned.



Present findings about the AR teaching and learning approach can improve not only learning attitudes but also the students' learning performance. Several studies also show that there is a strong link between attitude and academic achievement. This study aims to determine the relationship between the students' academic performance and their biology attitude with the use of AR in teaching and learning **biodiversity**.

## 2 METHODS

### CORRELATIONAL DESIGN

ACADEMIC PERFORMANCE

ATTITUDE

### INSTRUMENTS

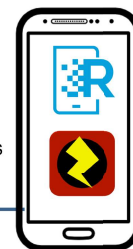
**HP Reveal** and **Zappar** are the AR mobile applications that was used to augment the students' activities.



### CLASS-Biology

COLORADO LEARNING ATTITUDE FOR SCIENCE SURVEY - BIOLOGY

An attitudinal survey instrument, which consists of 31 Likert Scale statements, was adopted to measure the students' attitude towards biology and inquire a range of perceptions that vary between experts and novices thinking-like beliefs before and after the intervention.



## 3 RESULTS

The graphs below illustrate the frequency distribution and relationship of the students' academic performance and attitude based on their posttest scores.

Figure a and b show the frequency histogram of the students' posttest performance on their academic performance and attitude towards biology. Both graphs reveal a positive effect of AR learning on the students' academic performance and their biology attitude.

### a STUDENTS' ACADEMIC PERFORMANCE

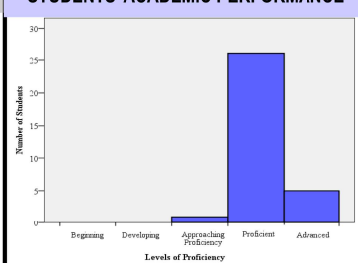
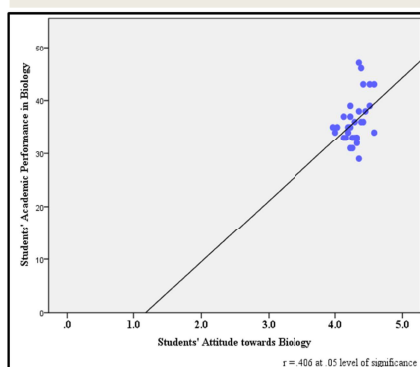
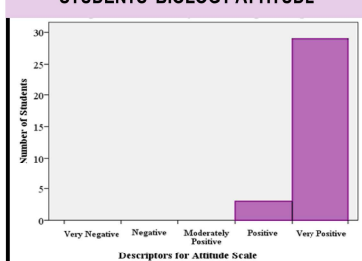


Figure c shows the pictographic representation of the relationship between the students' attitude and academic performance under the AR learning group. It reveals that the strength of association between the students' attitude and academic performance is **moderately positive** ( $r = 0.406$ ), and that the correlation coefficient is significantly different from zero ( $p$  value = 0.021).

### c CORRELATION BETWEEN STUDENTS' ACADEMIC PERFORMANCE AND ATTITUDE



### b STUDENTS' BIOLOGY ATTITUDE



## 4 DISCUSSION

The finding also suggests that 16% (0.406) of the variation in academic performance can be explained by the students' attitude towards biology. **This implies that as students' attitude under AR learning increases, the academic performance may also improve.**

The present findings agree with Chiang et al. (2014) that Augmented Reality approach in teaching and learning can improve not only learning attitudes but also the students' learning performance. Similarly, in the study conducted by Alsowat (2016), a positive significant correlation was found between attitude and their academic achievement using AR in education. Furthermore, Schibeci (1984) as cited by Osborne et al. (2003) stated that there is a positive link between attitude and achievement, quoting studies that show a correlation of 0.3 – 0.5.

## 5 CONCLUSION AND RECOMMENDATION

In summary, the relationship between the students' academic performance and attitude towards biology with the use of AR in teaching and learning biodiversity shows a moderate positive relationship between the students' attitude and academic achievement in biology. Based on the correlation analysis, there is a significant relationship between students' attitude and academic performance towards biology with the use of AR in the classroom at 0.05 level of significance.

This study suggests that by using AR learning in students' activities, teachers would need to utilize AR depending on the students' needs to be able to enhance both the students' attitude and the level of academic performance in learning a specific discipline.

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