

**EFFECTS OF ANIMATION AND VIDEO-BASED FLIPPED CLASSROOM  
STRATEGIES ON PRE-DEGREE STUDENTS' LEARNING OUTCOMES IN  
PRACTICAL BIOLOGY IN SOUTHWESTERN NIGERIA**

BY

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## **CERTIFICATION**

I certify that the research work that culminated in the writing of this doctoral thesis was carried out by Abiola Afolabi AKINGBEMISILU (Matric Number 142239) under my supervision.

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## **DEDICATION**

This work is dedicated to God almighty, the giver of life. Also, to my ever-supportive and caring wife, Temitope; my lovely sons, Omokayode, Omotayo and Ayomide.

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## ABSTRACT

Biology is a compulsory subject for pre-degree science students in Nigerian universities; however, a decline in students' performance in practical biology has been observed. Previous studies focused on strategies of teaching practical biology with little attention on animation and video-based flipped strategies. This study, therefore, determined the effects of Animation-based Flipped Classroom Strategy (AFCS) and Video-based Flipped Classroom Strategy (VFCS) on pre-degree students learning outcomes (achievement in, attitude to and practical skills) in practical biology in Southwestern Nigeria. The moderating effects of gender and computer self-efficacy were also examined.

Constructivist social learning theory provided the framework, while the pretest-posttest control group quasi-experimental of 3x3x2 factorial matrix was adopted. Purposive sampling technique was used to select 174 pre-degree students (69 males, 105 females) from three state universities (Adekunle Ajasin, Tai Solarin and Osun State) offering pre-degree programme. The universities were selected based on availability of functional Science laboratories. Participants were assigned into AFCS (71), VFCS (51) and control (52) groups, while treatment lasted eight weeks. Instruments used were Biology Practical Achievement Test ( $r=0.82$ ), Students Attitude to Biology Questionnaire ( $r=0.73$ ), Biology Practical Rating Skill Scale ( $r=0.81$ ), Computer Self-efficacy Questionnaire ( $r=0.88$ ) and instructional guides. Data were analysed using Analysis of covariance and Scheffe post-hoc test at 0.05 level of significance.

There were significant main effect of treatments on achievement ( $F_{(2,155)}=4.08$ , partial  $\eta^2 = 0.05$ ), attitude ( $F_{(2,155)} = 2.93$ , partial  $\eta^2 = 0.04$ ) and practical skills ( $F_{(2,155)} = 23.90$ , partial  $\eta^2 = 0.24$ ) in practical Biology. Students in the AFCS had the highest achievement mean score (23.48) followed by VFCS (21.05) and the control (19.11) groups. There was a significant main effect of gender on students' Achievement ( $F_{(1,155)} = 4.08$ , partial  $\eta^2 = .03$ ). While the female participants scored the higher mean score (22.60) than their male (19.83) counterparts. There was a significant two-way interaction effects of treatment and gender on students' practical skills in Biology ( $F_{(2,155)} = 4.10$ , partial  $\eta^2 = 0.05$ ), in favour of female students in the animation-based group. There were no three-way interaction effects of treatment, gender and computer self-efficacy on students' learning outcomes in practical Biology.

Animation and video-based flipped strategies were effective in improving pre-degree students' achievement, practical skills and attitude to practical Biology in Southwestern Nigeria. There is the need to adopt these strategies for teaching pre-degree Biology students.

**Keywords:** Animation and video-based flipped classroom strategies, Achievement and practical skills in and attitude to Practical Biology, Pre-degree students

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