

The influence of using TikTok as a learning tool on grade 8 learners' understanding of static electricity

Jeanne KRIEK, Mari-Louise VAN DER MERWE

Department of Physics, University of South Africa, Science Campus, South Africa.

Abstract. TikTok videos were used in an exploratory study with grade 8 learners (n= 59) randomly assigned into three classes: Experimental Groups (EG1; EG2), and Control Group (CG). Content creators developed the TikTok videos which included real-life examples. In the lessons, the learners in the experimental groups watched seven teacher curated TikTok videos on concepts in static electricity. Findings indicate that EG2 learners had a significant statistical difference ($p = 0.03471$) in performance compared to EG1 and CG. From Hake's average gain a moderate positive gain was found for EG1 and EG2, which is in significant contrast to the CG.

Introduction

TikTok has over one billion active users in 154 countries, of which 32.5% are Generation Z [2] the highest percentage of users of any age group. Doyle estimated that more than 60% of Gen Z use TikTok to search for information on a topic, instead of using Google. Despite the prevalence of TikTok use among Gen Z, it is yet to be robustly researched. Therefore, the influence of TikTok videos was explored with grade 8 students on the topic static electricity. This topic was chosen as it is a foundational to most electricity chapters [4] while learners have difficulty to comprehend fundamental concepts such as atoms, and electrical charge which in turn makes it challenging for them to understand the properties and behaviour of charges [3].

The theoretical framework that underpins this study is connectivism, a learning theory to understand and investigate learning in the digital age [6]. Digital connection can improve decision-making, problem-solving and encourage contextualisation of information[5]. Connectivism enables learning to happen outside of an individual, through social media and online platforms/forums [1]. "At the centre of connectivism is the notion that learning is a networked phenomenon, shaped and supported by the forces of technology and socialisation" [5].

Methodology

An exploratory research design was used to explore the influence of the use of TikTok as a learning tool on the performance of Grade 8 learners on static electricity. This quantitative approach is rooted in the positivist paradigm. The intervention involved learners in EG1 and EG2 being exposed to seven TikTok videos between the length of 15 – 58 seconds throughout the static electricity lesson. This approach was contrasted with the CG's traditional teacher-centred teaching approach. A pre-post-test on the topic static electricity was developed and content and face validity were established by two subject specialists in the field. The reliability of the pre and post-test were ensured by having the above subject specialists moderate the marker by evaluating the same responses, and the scores given for consistency. The pre-test was administered to establish baseline knowledge, and the post-test to measure learning gains after the TikTok-based intervention. The pre-test was given to all 3 groups on the same day at the same time. ANOVA was conducted to establish if the three groups were of similar ability. The intervention followed by using the TikTok videos with the two experimental groups while traditional teacher-centred teaching was used with the control group. A post-test was given after the intervention the same day at the same time to all three groups. ANOVA and t-tests were used to establish the effect in terms of performance

between the three groups. In addition, Hake's normalized gain was used to evaluate the effectiveness of this teaching method in enhancing student understanding.

Results

The ANOVA results show that the pre-test results for EG1, EG2 and CG do not show significant differences as the p-value is 0.904 whereas the post test results between the three groups show significant differences with a p-value of 0.014 in post-test results. This suggests that the intervention was effective.

Table 1: Anova results for pre and post tests

Source	Df	Sum of Squares	F-Value	p-Value	Significance
Pre-test	2	0.30	0.10	0.904	No
Post Test	2	13.85	4.60	0.014	Yes

When t-tests were done to establish the difference between the pre-post-test in each group, a p-value of 0.03471 which is smaller than 0.05 was found for EG2, indicating statistical significance, whereas EG1 and the CG does not show statistical significance. Thus, for EG1 there was no significant difference in performance of Grade 8 learners who were exposed to TikTok compared to the traditional teaching methods.

Hake's average gain was used to quantify the effectiveness of the use of TikTok as a teaching tool, as it is very different to traditional teaching approaches. The scale of gain between the CG (-0.1667), and the EG1 and EG2 (0.0143 and 0.01837 respectively) indicate the potential effectiveness of TikTok as a teaching tool, as there is a moderate positive gain leading to an improvement in the EG, which is in significant contrast to the GG.

References

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