

---

## EFFECT OF LEARNER COLLABORATION ON FACEBOOK SOCIAL NETWORKING PLATFORM ON ACADEMIC ACHIEVEMENT IN COMPUTER STUDIES IN PUBLIC SECONDARY SCHOOLS, NAIROBI CITY COUNTY, KENYA

<sup>1</sup>Peter Kyalo Mulwa, <sup>2</sup>Samuel Owino Mwanda, <sup>3</sup>Jane Ciumwari Gatumu <sup>4</sup>Evanson Muriuki Muriithi

<sup>1-4</sup>University of Nairobi

Email: <sup>1</sup>[peter.kyalo@uonbi.ac.ke](mailto:peter.kyalo@uonbi.ac.ke); <sup>2</sup>[somwanda@uonbi.ac.ke](mailto:somwanda@uonbi.ac.ke); <sup>3</sup>[jgatumu@uonbi.ac.ke](mailto:jgatumu@uonbi.ac.ke); <sup>4</sup>[evanson.muriuki@uonbi.ac.ke](mailto:evanson.muriuki@uonbi.ac.ke)

---

### ABSTRACT

*The adoption of Facebook Social Networking Platform (FSNP) as an instructional tool has been found to have an impact on learning outcomes. This is owed to the platform's technology affordances that support collaborations which in turn aid learner engagement, content sharing, learner-learner, learner-content and learner-teacher interactions. The purpose of this study was to establish the effect of learner collaboration on Facebook Social Networking Platform on academic achievement in Computer Studies in public secondary schools, Nairobi City County, Kenya. The objective was to assess the difference in learner academic achievement between learners who collaborate on FSNP and those who do not. The study targeted students in form three taking Computer Studies and their teachers. Quantitative data was obtained using pre-test and post-tests scores and qualitative data using questionnaires, observation and interview schedules. Purposive sampling was used to obtain 250 students from three boys' and three girls' public secondary schools which offer Computer Studies as an examinable subject at national level. Descriptive statistics computed included frequencies, means, variances and standard deviation. Inferential statistics were computed using t tests. Findings revealed a statistically significant differences in learner academic achievements between learners who collaborated on FSNP and those who did not; t statistic [t (155) = 12.58, p = .00]. The study concluded that learner collaboration on FSNP has a positive effect on learner academic achievement among Computer Studies students and that when engaged in elaborate tasks.*

*The study recommends adoption of social networking platforms (SNPs) for learner collaboration in schools in Kenya.*

**Keywords:** Facebook, Social Networking Platform, Learner Collaboration, Learner Academic Achievement, Computer Studies

### INTRODUCTION

Collaboration takes place when group of learners work together to solve a problem, complete a task or create a product. Traditionally, learner collaboration has taken place in face to face environment, however, with the integration of technology in teaching and learning, there is a paradigm shift on how, when and where learner collaboration can happen. One such technology is the Facebook Social Networking Platform (FNSP) which is credited for offering an interactive online environment for learner collaboration.

This technology and online tools have been found to have an impact on learner academic achievement because of their capacity to support learner engagement, content sharing, learner-learner, learner-content and learner-teacher interactions (Mulwa and Muriithi, 2018).

For instance, in an exploratory study to investigate collaborative tele-learning, Alavi, Wheeler & Valacich (1995) observed that collaborative learning requires an interactive environment for meaningful learner-learner engagement and high learner achievement. In support of the observations by Alavi, et al. (1995), Lorcher (2019) opine that online interactive environment supports virtual collaborative learning which enhance problem-solving skills, improve social interactions, communication skills and inspire critical thinking among learners resulting to improved learner achievement.

This indicates that collaborative leaning plays an important role in determining learner academic achievement. While Alavi, et al. (1995) and Lorcher (2019) point out possible effect of learner collaboration on such online platforms, research interests in this study focused on determining the effect of learner collaboration on FSNP on academic achievement among Computer Studies Students in public secondary schools in Nairobi City County, Kenya.

In a study on the relationship between Facebook and the well-Being of undergraduate college students, Kalpidou, Costin and Morris (2011) opined that learner collaboration on FSNP enabled learners to share knowledge and develop skills as they would on a face-to-face environment. Similarly, in a survey study that focused on

studentsø perceptions of using Facebook as an interactive learning resource at university Irwin, Ball, Desbrow & Leveritt (2012) concluded that FSNP has the potential to facilitate learner and teacher interactions and engagement. While the studies by Kalpidou. et al. (2011) and Irwin, et al. (2012) pointed out that FSNP offered a platform for learner collaboration and cooperation, the studies involved university students and their findings can be used to generalize the effect of the technology on learner academic achievement in a specific subject at lower levels of study.

In a related study, that explored the positive and negative impacts of using SNP in education, Raut & Patil (2016) observed that the FSNP environments place the control of learning into the hands of the learner, thus offering a suitable platform for learner collaboration. However, the study by Raut & Patil (2016) did not focus on the effect of learner collaboration through FSNP on the academic achievement.

Concurring to these viewpoints, in a literature review on the role of social media for collaborative learning to improve academic performance of students and researchers in Malaysian higher education, Al-rahmi, Ohman and Yusuf (2015) posited that learner collaboration on SNPs such as FSNP improves learner productivity, satisfaction, engagement and academic

achievement. Further, in a study to establish the influence of SNP on collaborative learning among environmental doctorate students at Wilmington University in USA, Wandera, Waldon, Bromley and Henry (2016) concluded that collaborative learning via SNP enhance academic achievement. Further still, Sarwar, Zulfiqar, Azizi and Chandia (2018) in a survey on usage of social media tools for collaborative learning among students at the University of Science and Technology of China concur that there is a significant positive relationship between collaborative learning on a SNP such as Facebook and learner academic achievement.

Learner collaboration on social networking platforms such as FSNP help learners in gaining problem solving skills. Problem solving skills are important in determining learner academic achievement.

While alluding to this viewpoint, in a study that focused on the effects of online learner collaboration and problem-solving abilities among senior secondary school physics students in simple harmonic motion, Adolphus, Alamina and Aderonmu (2013) concluded that there were gains in problem-solving skills among learners taught using online collaborative learning strategy and those taught with the traditional methods. Further, in a study on the overview of problem solving skills through social networking platform, Jamari, Zaid,

Mohamed, Abdullah and Aris (2015) observed that the use of FSNP in teaching and learning enabled learners to participate through collaboration which helped them to improve their problem-solving skills and academic achievement.

Further, in an exploration study on how secondary school students' agency evolves over time across offline and online spaces, Júnior, Kruistum, Kontopodis and Oers (2019) opined that under teachers' guidance, FSNP serve as a collaborative learning environment where learners easily understand the problem being solved and conceptualize the solution with ease leading to high confidence and enhanced problem-solving skills. This implies that educators should adopt instructional platforms that offers suitable environment for collaborative learning and problem-solving.

Collaboration on SNPs such as FSNP has been associated with learner motivation which contribute immensely on learner academic achievement. Ziegler (2007) notably posited that Facebook has the capacity to better motivate students as engaged learners rather than learners who are primarily passive observers of the educational process. Similarly, Wang and Vasquez (2012) opined that FSNP has the capacity to promote greater interactive learning opportunities through genuine communication and social interaction

among learners. These viewpoints concur with the findings by McCarthy (2012) who observed that FSNP offers opportunities for learners to collaborate and share knowledge. Further, Özyurt and Özyurt (2016) in a study is to evaluate the effect of using Facebook on enriching the learning experiences of students in programming learning, observed that FSNP offers an environment for learner collaboration which increase learner motivation and influence their academic achievement.

Further still, Filgona, Sakiyo, Gwany and & Okoronka (2020) point out that highly motivated learners make the learning environment interesting to teach and learn readily while unmotivated learners make teaching unenjoyable and learn very little.

This indicates that, for learners to participate in an online collaborative learning platform such as the FSNP, they must be motivated to learn if meaningful academic achievement it to be attained.

Learner collaboration on social networking platforms such as FSNP help learners to hone their communication skills which are important in determining their academic achievement. While contributing to learner collaboration and communication, in a study to establish how teachers from different cities in Brazil used groups on FSNP and how communication between teachers and students was affected by using such groups, Cunha, Kruistum and Oers (2016) observed improved communication between teachers

and students which led to effective engagement in collaborative learning activities.

While agreeing to the findings by Cunha, et al. (2016), Dweikat (2016) in an experimental study that investigated the effect of using FSNP on improving the communication skills in English through a blended teaching approach established statistically significant difference in achievement between the experimental groups. Dweikat (2016) argued that FSNP offered a collaborative learning platform where learners could have discussions, share ideas, documents, photos, videos, chats and links to relevant websites which played a great role improving their communication skills and academic achievement.

Further, in a study to examine the ways of using FSNP as a medium of enhancing communication skills among students, Vivekha and Babu (2020) opined that learner collaboration on FSNP is an entertaining mode of unconscious learning in that, students express their ideas, thoughts and feelings freely, thus enabling them acquire communication skills and learn content shared unconsciously. This contributes to positive gains in their academic achievement. In support of this viewpoint, in an empirical study on online assessment which implemented a blended approach combining peer assessment on FSNP with face to face instruction for an English writing course, Mahmud and Wong (2018)

opined that learner collaboration on the platform induces participation and engagement enabling them to replicate, act, learn from each other.

This creates significant knowledge and skill leading to improve academic achievement. However, this study involved college students. In a related study involving university students on exploring the role of social media in collaborative learning as the new domain of learning, Ansari and Khan (2020) observed that use of online social media such as FSNP for learner collaboration has a significant impact on interactivity among learners, teachers and online knowledge sharing behaviors which ultimately impact on the learners’ academic achievement. While the reviewed literature indicates possible effect of Facebook SNP collaborative learning on learner academic achievement, these studies involved college students and cannot be used to generalize the effect of collaborative learning through the platform on other subjects such as Computer Studies and at lower levels of education such as secondary school in a developing country like Kenya.

**Statement of the Problem**

The learner academic achievement in the Computer Studies among students in the Kenya Certificate of Secondary Education (KCSE) in the last five years has been impressive.

However, the students’ consistent low achievement on the compulsory questions drawn from the form three topic on ‘Elementary Programming Principles’ as shown in table 1 and table 2 draws attention of every educationist.

*Table 1: Trend in Learner Academic Achievement in Computer Studies Subjects and in Question 16*

Year	2015	2016	2017	2018	2019
<b>Overall Mean</b>	55.62	57.67	60.42	57.37	61.49
<b>Paper 1 (451/1) Question 16 Performance</b>	Poor	Poor	Poor	Poor	Poor

Table 2: Kenya National Examinations Council (KNEC) KCSE Grading System

<b>Percentage (%)</b>	80-100	75 ó 79.99	70-74.99	65-69.99	60-64.99	55-59.99	50-54.99	45-49.99	40-44.99	35-39.99	30-34.99	0-29.99
<b>Grade</b>	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
<b>Points</b>	12	11	10	9	8	7	6	5	4	3	2	1

The Kenya National Examinations Council (KNEC) reports indicate that learners consistently posted low achievement in the compulsory question 16 in section B of Computer Studies Paper 1 (451/1) in the KCSE examinations for five years (KNEC Report, 2015, 2016, 2017, 2018 and 2019). While Computer Studies teachers always have put every effort to improve learner achievement on this section of the national examination paper, there are no studies that point out how engaging learners in collaborations on FSNP to share knowledge and skills on the topic would impact on the learning outcome. Improved achievement in this compulsory question would lead to overall higher learner achievement in Computer Studies. This study sought to empirically establish the effect of learner collaboration on FSNP on learner academic achievement in Computer Studies among students in public secondary schools in Nairobi City County, Kenya.

**PURPOSE OF THE STUDY**

The purpose of the study was to establish the effect of learner collaboration on Facebook Social Networking Platform on academic achievement in Computer Studies in public secondary schools, Nairobi City County, Kenya. The specific objective of this study was to assess the difference in learner academic achievement between learners who collaborate on FSNP and those who do not. Based on this objective, the null hypothesis;  $H_0$ : *There is no significant difference in learner academic achievement between learners who collaborate on FSNP and those who are not*” was formulated and tested.

**METHODOLOGY**

This study adopted the quasi-experiment research design involving non-equivalent groups with pre-test and post-tests used to collect data. The non-equivalent groups design was adopted in this study because the target population differed in numbers and characteristics in terms of gender and entry behaviors.

According to Rubin & Babbie (2007), non-equivalent groups design is the common type of quasi-experimental designs because it is similar to the classic experimental design except that the groups are not randomly assigned. This study involved a control group and treatment group which were as similar in baseline characteristics as possible. In this study, learner collaboration on Facebook Social Networking Platform was used as the intervention. According to White and Shagun (2014), an intervention, enables a researcher to manipulate the control and treatment groups to determine the causal effect.

The target population was two thousand five hundred (2,500) form three Computer Studies students from thirty-seven (37) boys' and twenty-eight (28) girls' public secondary schools offering Computer Studies in Nairobi County, Kenya. Most schools in Nairobi County have robust information and communication technology (ICT) infrastructure including reliable Internet connectivity required to implement the Computer Studies curriculum, thus found suitable for the study unlike others located outside the capital city of Kenya.

Purposive sampling was used to get about two hundred and fifty (250) Computer Studies students from three (3) boys' and three (3) girls' public secondary schools in Nairobi County.

The students were drawn from schools which offer Computer Studies as an examinable subject by the Kenya National Examinations Council. In this study form three students were selected to participate because they final examination candidates. The students were also suitable for the study because the topic taught during the experiment is offered in form three according to the Computer Studies syllabus for Kenya secondary education. Further, to meet the objectives of this study, students who participated in the study were from the public boys' and girls' secondary schools that: offer computer studies as KNEC examinable subject, have dependable Internet connection, have a student to computer ratio of at least 1:2 and have uninterrupted electricity connection. The Computer Studies subject teachers from those schools participated in the study.

The order of the questions in the pre-test were reorganized to form the post-test. This was done in order to ensure internal validity of the instruments used in this study. Matching method was used to purposely sample schools that assured similar learning environment for the control and the experimental groups. This was done in order to ensure external validity of the research instruments. Further, piloting of the research instruments was done in three schools before the beginning of the experiment in order to determine the difficulty level of the questions, identify area of improving

questionnaire for the students, lesson observation and teacher interview schedule. Internal consistency of the research instruments, the results obtained from the tests (pre-test and Post-test) and the data from the questionnaire for students were used to compute the correlation coefficient using the split-half technique to eliminate chance error. The resulting split-half averages were used to compute the Cronbach's Alpha ( ) reliability coefficient. The tests had an r value of 0.81 and the questionnaire had an r value of 0.86. A reliability coefficient of more than 0.5 is considered adequate enough for instruments to be used in social research (Kothari, 2011) implying that the instruments used in this study were very reliable.

To examine this, the students participating in the study were grouped into two groups; control and treatment quasi-experimental groups. The students in the two groups were taught the topic on "Elementary Programming Principles". However, the students who participated in the treatment group were allowed to collaborate on FSNP under the guidance of their teachers as an intervention in the experiment while those in the control group did not collaborate on the platform. Girls collaborated between girls while boys collaborated between boys because of strict school policies that did not allow the researcher to combine students in schools of opposite gender.

Before the teaching of the topic began, a pre-test was administered to the two groups and marked out of a maximum score of 100. The pre-test was administered to ensure that the two groups were as similar as possible in terms of their baseline knowledge of the topic taught. After the teaching of the topic ended, a post-test was administered to determine the student academic achievement. The post-test was also marked out of a maximum score of 100.

The post-test was administered to determine the academic achievement of the two groups after the teaching and the intervention of exposing the treatment group to collaborations on FSNP. During the experiment, lesson observations were made to determine how learners were engaged in problem solving, communication and whether they were motivated to collaborate on FSNP. After the experiment, a questionnaire was administered to the students in the treatment group and the teachers. Teacher interviews were also conducted after the experiment to take their views on learner collaboration on FSNP and learner academic achievement. The qualitative data obtained through the questionnaires and interview schedule helped to verify and triangulate the experimental findings.



**FINDINGS AND DISCUSSION**

The Mean scores (M) and standard deviation ( ) of the pre-test for both the control and treatment groups were computed and recorded as shown in Table 1 in order to determine the similarity between the two groups before the teaching began while the standard deviation was computed to determine how the scores were dispersed from the mean.

*Table 3: Means of Pre-Test Scores of the Learners in the Control Group and Treatment Group Before Collaboration on FSNP Started*

Pre-Test Mean Scores					
Groups	Frequency	Sum	Mean	Variance	Std Dev (s)
Pre_Test_Control_Group	77	1117	14.51	55.44	7.44
Pre_Test_Treatment_Group	126	1750	13.89	35.01	5.92

Table 3 shows that mean of the pre-test for students in the control group was 14.51 with a standard deviation = 7.44 and that of those who participated in the treatment group was 13.89 with a standard deviation of = 5.92. This indicated that the students in the control group and the treatment group posted low and different academic achievement before quasi-experiment started. The variability of test scores for the two groups, control group = 7.44 and treatment = 5.92 were low and indicated that the scores from the two tests were normally distributed.

Table 3 also shows the treatment group posted lower mean score than the control group which could be attributed to different factors among them; teacher characteristics, learner characteristics, number of learners, gender of learner and the learning environment and some students reading ahead of others. However, this implied that the learners from the two groups had low baseline knowledge of content under the topic that was to be taught.

To determine whether there was statistically significant difference in learner academic achievement between the two groups in the pre-test, inferential statistics was computed using t-test as shown in Table 4 to determine whether there was statistically significant difference in learner academic achievement before the start of the teaching and the treatment. The t-test was appropriate in this case because there was need to compare the scores of the student achievement test for both groups in order to examine the difference in learner academic achievement between them before and after an intervention.

Table 4: A t-Test Comparing the means of Pre-Test Scores of the Learners in the Control Group and Treatment Group Before Collaboration on FSNP Started

	Pre_Test_Control Group	Pre_Test_Treatment Group
Mean	14.51	13.89
Variance	55.41	35.01
Observations	77	126
Hypothesized Mean Difference	0	
df	134	
t Stat	0.62	
P(T<=t) one-tail	0.27	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.54	
t Critical two-tail	1.98	

Table 4 shows that there was no statistically significant difference in learner academic achievement between the learners in the control group and those in the treatment group before the experiment was started as demonstrated by the t statistic [ $t(134) = .62, P=.54$ ]. This is because the  $p=.54$  was higher than the confidence level of  $P=.05$ . This implied that the students in control group and the treatment had similar baseline knowledge of the topic before it was taught. At the end of the teaching of the topic and intervention for the treatment group, a post-test was administered to both groups to determine the learner academic achievement. The means of the post-test scores of all the students who collaborated on FSNP and those who did not were computed as shown in Table 5.

Table 5: Means of Post-Test Scores of the All Students Who Collaborated on FSNP and Those who did not

Pre-Test Mean Scores					
Groups	Freq	Sum	Mean	Variance	Std Dev (σ)
Post_Test_Control_Group	77	2562	33.27	176.20	13.28
Post_Test_Treatment_Group	126	7188	57.04	161.84	12.72

Table 5 shows that 126 students who participated in collaborative learning on FSNP (treatment group) had higher learner academic achievement (mean score,  $M=57.04, \sigma = 12.72$ ) than the 77 students (control group) who were not (mean score,  $M=33.27, \sigma = 13.28$ ). The variability of test scores for the two groups, control group  $\sigma = 13.27$  and treatment  $\sigma = 12.72$  were low and indicated that the scores from the two tests were normally distributed. The difference in the means of the two groups implied that there was a causal effect of the intervention.

This indicated that the participation in collaborative learning on FSNP (intervention) of the students in the treatment group contributed to more effective learning hence posting a higher mean than that of the control group that was not exposed to the intervention. This could be associated to FSNP's technology affordances that supported learner collaboration through discussions; chats; doing quizzes and getting immediate feedback; sharing of documents, photos, recorded and live videos which led to effective learning, hence high academic

achievement in the treatment group than the control group.

The post-test means of the students who collaborated on FSNP (treatment group) and those who did not (control group) were further subjected to t-test inferential statistics to test the hypothesis “ $H_{O1}$ : There is no statistically significant difference in learner academic achievement between learners who collaborate on FSNP and those who did not”. The t statistic was computed as shown in Table 6.

Table 6: A t-Test Analysis Comparing the Means of Post-Test Scores of the Students Who Collaborated on FSNP and Those who did not

	Post_Test_Control Group	Post_Test_Treatment Group
Mean	33.27	57.05
Variance	176.20	161.84
Observations	77	126
Hypothesized Mean Difference	0.00	
df	155.00	
t Stat	-12.58	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.98	

Table 6 shows t statistic [ $t(155) = 12.58, p = .00$ ] where the p-value is less than the confidence level  $p = .05$  revealing that there was a statistically significant difference in learner academic achievement between learners that collaborated on FSNP and those who did not.

Thus, the hypothesis  $\bar{H}_{O1}$ : “There is no statistically significant difference in learner academic achievement between learners who collaborate on FSNP and those who do not” was rejected and the alternate hypothesis accepted. This infers that there was a statistically significant difference in learner academic achievement between learners collaborated on FSNP to learn Computer Studies and those who did not.

The findings in this study implies that learners who participated in collaborative learning were more engaged through interactions with the content (learner-content), colleagues (learner-learner) and teachers (learner-content). This made learners interested and motivated to learn thus leading to the effective learning among those who collaborated on FSNP unlike those who did not. The collaborative learning enabled learners to acquire problem-solving and communication skills, hence the high academic achievement for the students in the treatment group than those in the control group. These findings in this study corroborated existing studies that suggest that learner collaboration on FSNP contribute to increased learner academic performance.

For instance, in their study, Mahmud and Wong (2018) observed that learner collaboration on Facebook induces learner participation and engagement enabling them to replicate, act, learn from each other and create significant knowledge and skill. Mahmud and Wong in their empirical study, employed blended learning approach to leverage on the integration of technology to determine the viability of Facebook and online peer assessment's integration for an English Critical and Creative Writing class. Mahmud and Wong noted the importance of in integrating Facebook in online assessment and collaborative learning to enhance students' interest and motivation. However, in their study, Mahmud and Wong did not focus on the effect of collaborative learning on FSNP to learner academic achievement and only involved learners at college level who are expected to be responsible in using social media unlike the learners in secondary school level. This was addressed in this study which revealed that collaborative learning on FSNP significantly contributed to positive gains in learner academic achievement public secondary school learners in Nairobi City County, Kenya.

Similarly, in a study involving university students in India that examined the usefulness of social media in collaborative learning and sharing resources, Ansari and Khan (2020) observed that social media offer platforms suitable for learner engagement

through collaborative learning. Ansari and Khan argued that learner collaboration through social media impacts on interactivity with peers, teachers and online knowledge sharing behaviors. Ansari and Khan further pointed out that engagement in learner collaboration through on social media make learning interesting and enjoyable, thus impacting on the learners' academic achievement. However, this survey study by Ansari and Khan did not focus on the effect of collaborative learning through any specific social networking platform on learner academic achievement and involved University students who are expected to have self-regulation when using social media unlike those in secondary school. This study addressed this gap by conducting a quasi-experiment study to establish the effect of collaborative learning through FSNP on learner academic achievement among secondary school students.

The findings in this study were verified through qualitative data that was collected using students and teachers' questionnaire, teachers' interview and data observation schedule. For the purpose of this study, the qualitative data collected using these instruments focused on three dimensions of collaborative learning through FSNP, that is, problem-solving skills, motivation and communication skills.

Specifically, the questionnaires sought to establish the views of the students and teachers on the extent to which they agreed with the statement that “Collaborative learning through FSNP has effect on learner academic achievement” because it enhances learner problem-solving skills, motivation and communication skills.

The data collected from the students and the teachers’ questionnaires was analyzed to compute the mean statistics of the responses per every dimension as shown in Table 7. The questions under each dimension or sub-theme of the questionnaires were coded using numbers 1 to 5 for easy of entry into SPSS computer program and statistical analyzes using mean (M). The questions under each dimension or sub-theme were pooled together to compute the mean of responses under it as showed in Table 7.

*Table 7: Means of Students and Teachers’ Responses on Their Views Per Dimension on the Effect of Collaborative Learning Through FSNP on Learner Academic Achievement*

Sub-theme/Dimension	Mean of Teachers’ Responses	Mean of Students’ Responses
FSNP Collaborative Learning & Problem-Solving Skills	4.47	4.01
FSNP Collaborative Learning & Motivation	4.41	4.17
FSNP Collaborative Learning & Communication Skills	4.44	4.02

Table 7 shows that majority of the students and teachers strongly agreed that collaborative learning through FSNP had effect on learner academic achievement because it enhanced learners problem-solving skills, motivation and communication skills. The findings were further verified by data collected using lesson observation schedule and teachers’ interview guided by the three dimensions. The contribution of learner collaboration through FSNP to learner academic achievement was discussed per sub-themes based on the three dimensions considered in this study, that is; learner collaboration on FSNP and problem-solving skills, Learner collaboration on FSNP and motivation and Learner collaboration on FSNP and communication skills.

Table 7 shows that a majority of students and teachers with means M = 4.01 and M = 4.47 respectively strongly agreed that collaborative learning through FSNP had effect on learner academic achievement because of it enhanced learners’ problem-solving skills. This implies that, the engagement of the learners on FSNP for collaborative learning enabled learner to acquire more problem-solving skills as they discussed tasks given during the lessons. It further implies that students through the platform actively shared knowledge, ideas and techniques of tackling tasks given.

To affirm this, one of the teachers interviewed said that:

Discussion was mostly used especially when I posted a topic or task to solve. The learners would discuss through chatting and sharing relevant videos. I think the collaborative interactions on Facebook contributed immensely in my students' performance in the second test I gave. Exchanging ideas enabled them to acquire good problem-solving skills which I think made them performed well in the second test than in the first test.

The findings from this study were further affirmed by the observations made during the study on learners' problem-solving skills during the lesson. The observations made indicated that whenever there were properly structured group tasks for the collaborative learning on the FSNP, students worked cooperatively, 95% of the students actively participated in the lesson and conceptualized the problems being solved with ease. Further, the observation data showed that collaborative learning on FSNP enabled learners to gain self-confidence, self-esteem and increased problem-solving skills.

This implied that learner collaboration through FSNP enabled the students to acquire and reinforce their problem-solving skills by sharing ideas and helping each other in the tasks given. These findings further confirmed the findings by Adolphus, Alamina and Aderonmu (2013) who in a study on the effects of collaborative learning on problem-solving abilities among senior secondary school physics students in simple harmonic motion, observed gains in problem-solving skills among learners taught using collaborative learning strategy than those taught using the traditional methods of teaching. However, Adolphus, et al. (2013) did not consider learner collaboration through a technology platform such as FSNP.

The findings in this study also confirmed the findings in a related study that focused on the potential of using Facebook as an informal alternative learning tool to enhance problem-solving skills among school students, Jamari, Zaid, Mohamed, Abdullah and Aris (2015) concurred with the findings in this study by concluding social networking sites in teaching and learning enable learners to participate through collaborative learning which help them to improve their problem-solving skills. Jamari, et. Al. observed that participating actively in discussions on Facebook encourage students and help them in improving their problem-solving skills.

However, the exploratory study by Jamari, et al, did not consider how the problem-solving skills acquired through collaborative learning through the social networking sites impacted on learner academic achievement, a gap that was addressed in this study through an empirical study. Further still, the findings in this study concurred with the findings in a study by Júnior, Kruistum, Kontopodis and Oers (2019). In their exploration study on how secondary school students' agency evolves over time across offline and online spaces, Júnior, et al. (2019) opined that under teachers' guidance, online space such as Facebook serve as a collaborative learning environment where learners easily understand the problem being solved and conceptualize the solution with ease leading to high confidence and enhanced problem-solving skills. However, in a slight departure from the findings in this study, Júnior, et al. (2019) did not explore the effect of collaborative learning through Facebook on learner academic achievement.

Table 7 shows that a majority of students and teachers with means  $M = 4.17$  and  $M = 4.41$  respectively strongly agreed that collaborative learning through FSNP had effect on learner academic achievement because of it learners were motivated to learn through the platform. This implies that, the engagement of the learners in collaboration through FSNP made learning enjoyable and captivating thus leading to effective learning.

To affirm this, one of the teachers interviewed said that:

*My students participated on discussing the questions I posted, they asked questions and answered questions, shared some learning materials, attempted the quiz I gave and they uploaded and downloaded documents. They were free to interact and they collaborated very well than the usually do in their discussion groups. What I can say is that my students were motivated to engage in the discussions on FSNP more than when they are when participating in discussion groups in the class.*

This interview response from the teacher implies that learners would be motivated to participate in collaborative learning conducted online using FSNP. The importance of motivation is emphasized by Filgona, Sakiyo, Gwany and & Okoronka (2020) who hold the view that highly motivated learners make the learning environment interesting to teach and learn readily while unmotivated learners make teaching unenjoyable and learn very little.

This indicates that, for learners to participate in an online collaborative learning platform such as the FSNP, they must be motivated to learn if meaningful academic achievement is to be attained. The findings in this study affirm findings by Ziegler (2007) who notably asserts that Facebook has the capacity to better motivate students as engaged learners rather than learners who are primarily passive observers of the educational process. Similarly, the findings concur with Wang and Vasquez (2012) who observed that FSNP has the capacity to promote greater interactive learning opportunities through genuine communication and social interaction among learners.

These viewpoints concurred with the findings by McCarthy (2012) who observed that FSNP offers opportunities for students to collaborate and share knowledge. Further, these findings confirmed the findings in a study by (2016 Özyurt and Özyurt) which evaluated the effect of using Facebook on enriching the learner experiences in learning programming. Özyurt and Özyurt concluded that Facebook has positive effects such as provided collaborative learning environment and increased learner motivation.

However, their study involved university students in Turkey and did not report on how enhanced student motivation by participating in collaborated learning through FSNP impacted on learner academic achievement,

a gap that was addressed in this study. Further, the data collected through the observation schedule verified the findings in this study. It was observed that the students did not prefer any collaboration partner, they attempted to respond to every question posted, 80% of them completed the learning activities on time and were not in a hurry to sign-off from online session. Teachers ably coordinated the learning sessions without challenges, they motivated and effectively controlled the learning activities throughout the lessons. This indicated how collaborative learning enhanced learners' communication skills, leading to effective learning and thus high academic achievement.

Table 7 shows that a majority of students and teachers with means  $M = 4.02$  and  $M = 4.44$  respectively strongly agreed that collaborative learning through FSNP had effect on learner academic achievement because of it learners acquired or had their communication skills enhanced. This implies that, the learners communicated effectively through the chats they posted and discussions they had during the collaborative learning on FSNP, a factor that contributed immensely in their academic achievement.



To affirm this, one of the teachers interviewed said that:

*Facebook provided a new class environment where they collaborated freely even in absence online. I observed that continuous engagement on FSNP would enable my student hone their communications skills because even the quite ones could read and post answers to the questions and share ideas. Reading, answering questions, participating discussions, downloading content and getting feedback from me and among themselves enabled my students' academic achievement improve.*

The findings from this study and the views from the teachers and students concur with the findings by Cunha, Kruistum and Oers (2016). The study by Cunha, et al. (2016) sought to establish how teachers from different cities in Brazil used groups on FSNP and how communication between teachers and students was affected by using such groups. Cunha, et al. (2016) observed that communication between teachers and students improved due to active engagement in collaborative learning activities on FSNP.

However, their study did not address the effect of the improved communication and collaborative learning on learner academic achievement, a gap that was addressed in this study. Similarly, the findings in this study confirmed the findings by Dweikat (2016) who in an experimental study to investigate the effect of using FSNP on improving the communication skills in English through a blended teaching approach. Dweikat established a statistically significant difference in achievement between the students who participated in the experimental groups. Dweikat (2016) argued that FSNP offered a collaborative learning platform where learners could have discussions, share ideas, documents, photos, videos, chats and links to relevant websites which played a great role improving their communication skills.

However, Dweikat's study involved University students studying English, did not focus of how communication skills and collaborating learning impacted on learner academic achievement in lower level levels, a gap that was addressed in this study. Further, the findings in this study affirmed the findings from a study by Vivekha and Babu (2020) who examined the ways of using FSNP as a medium of enhancing communication skills among students. In this study, Vivekha and Babu (2020) observed that collaborative learning on FSNP is an entertaining mode of unconscious learning in

that, students express their ideas, thoughts and feelings freely, thus enabling them acquire communication skills, learn content shared unconsciously and improve their academic performance.

The study recommends development of educational policies to provide guidelines on how FSNP can be adopted in schools in Kenya as a platform for learner collaboration.

### **CONCLUSION**

This study concluded that there is statistically significant difference between learners who collaborate on FSNP and those who do not. This study concluded that learner collaboration on FSNP has a positive effect on learner academic achievement among Computer Studies students in public secondary schools in Nairobi City County, Kenya. The study also concluded learner collaboration on FSNP motivated learners, enabled them to improve in their problem-solving and communication skills which contribute to their improved academic achievement. Further, the study concluded that giving elaborate tasks and closely supervising learners during collaboration on FSNP helped in minimizing learning interactions associated with non-academic available on the platform.

### **RECOMMENDATIONS**

This recommended that: Teachers should allocate elaborate tasks for learners to collaborate on through the FSNP. Teachers and parents instead not deny learners access to FSNP but rather guide them on how they can responsibly utilize the platform for learning purposes.

---

## REFERENCES

1. Adolphus, T., Alamina, J. and Aderonmu, T. (2013). The Effects of Collaborative Learning on Problem Solving Abilities among Senior Secondary School Physics Students in Simple Harmonic Motion.
2. Journal of Education and Practice. ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.4, No.25.
3. Alavi, M., Wheeler, C. B., & Valacich, S. J. (1995). Using IT to reengineer business education: An exploratory investigation of collaborative telelearning. *MIS Quarterly*, 19(3), 293-312.
4. Al-Rahmi, W, Ohman, M. & Yusuf, L. (2015). The Role of Social Media for Collaborative Learning to Improve Academic Performance of Students and Researchers in Malaysian Higher Education. *International Review of Research in Open and Distributed Learning Volume 16, Number 4*.
5. Ansari, J. A., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments*, 7(1). doi:10.1186/s40561-020-00118-7
6. Cunha, F. R., Kruistum, C. V., & Oers, B. V. (2016). Teachers and Facebook: Using online groups to improve students' communication and engagement in education. *Communication Teacher*, 30(4), 228-241. doi:10.1080/17404622.2016.1219039
7. Dweikat, K (2016). Impact of Using Facebook On Improving English Communication Skills: The Case of Implementing the English Language Course as A Model at Al-Quds Open University. *An - Najah Univ, J. Res. (Humanities)*. Vol. 30(11). doi:10.35552/0247-030-011-007.
8. Filgona, J., Sakiyo, J., Gwany, D. M., & Okoronka, A. U. (2020). Motivation in Learning. *Asian Journal of Education and Social Studies*, 10(4), 16-37. <https://doi.org/10.9734/ajess/2020/v10i430273>
9. Irwin, C., Lauren, B. & Desbrow, B. (2012). Students' perceptions of using Facebook as an interactive learning resource at university. *Australasian Journal of Educational Technology* 2012, 28(7), 1221-1232
10. Jamari, D, Zaid, N., Mohamed, H, Abdullah, Z. and Aris, Z. (2015). The Overview of Problem Solving Skill through Online Social Networking Platform. *Conference: 2nd International Education Postgraduate Seminar (IEPS- 2015)*, Pulau Spring Resort, Johor Bahru, Malaysia.

11. Júnior, F. R., Kruistum, C. V., Kontopodis, M., & Oers, B. V. (2019). Students on Facebook: From observers to collaborative agents. *Mind, Culture, and Activity*, 26(4), 336-352. doi:10.1080/10749039.2019.1690520
12. Kalpidou, Costin, D. & Morris, J. (2011). The Relationship Between Facebook and the Well-Being of Undergraduate College Students. *Cyberpsychology, Behavior and Social Networking, Volume 14, Number*. DOI: 10.1089/cyber.2010.0061
13. KNEC. (2015). The year 2014 KCSE Examination Report. *The Kenya National Examinations Council*.
14. KNEC. (2016). The year 2015 KCSE Examination Report. *The Kenya National Examinations Council*.
15. KNEC. (2017). The year 2016 KCSE Examination Report. *The Kenya National Examinations Council*.
16. KNEC. (2018). The year 2017 KCSE Examination Report. *The Kenya National Examinations Council*.
17. KNEC,(2019). The year 2018 KCSE Examination Report. *The Kenya National Examinations Council*.
18. Lorcher, T. (2019). Collaborative Learning Strategies in the Classroom. *Eduhup blog*. Retrieved from
19. <https://eduhup.com/blog/collaborative-learning-strategies-classroom>.
20. Mahmud, M. M., & Wong, S. F. (2018). Facebook and Collaborative Learning: An Empirical Study on
21. Online Assessment. *International Journal of Learning and Teaching*, 107-113. doi:10.18178/ijlt.4.2.107-113
22. Mulwa, P, and Muriithi, E. (2018). Influence of Facebook as a Pedagogical Interaction Tool on Learning Outcome Among Learners In Secondary Schools In Kenya. *International Journal of Education and Research*. 2018;6(4):19-30.
23. Özyurt, Ö. & Özyurt, H. (2016). Using Facebook to enhance learning experiences of students in computer programming at Introduction to Programming and Algorithm course. *Computer Applications in Engineering Education*, 24(4), 546-554. doi:10.1002/cae.21730
24. Raut, V., & Patil, P. (2016). Use of social media in education: Positive and negative impact on the students. *International Journal on Recent and Innovation Trends in Computing and Communication*, 4(1), 281–285.
25. Rubin, A., & Babbie, E. R. (2017). *Research methods for social work* (9th ed.). Belmont: Wadsworth.
- Sarwar, B., Zulfiqar, S., Azizi, S. & Chandia, K. (2018). Usage of Social Media Tools for Collaborative

- Learning: The Effect on Learning Success with the Moderating Role of Cyberbullying. Retrieved from <https://doi.org/10.1177/0735633117748415>.
26. Vivekha, S. and Babu, M. (2020). Facebook: A Medium in Enhancing Communication Skills in L2 Learners. *Journal of Critical Reviews*, ISSN- 2394-5125 Vol 7, Issue 6, 2020.
27. Wandera, S., James-Waldon, N., Bromley, D., & Henry, Z. (2016). The influence of social media on collaborative learning in a cohort environment. *Interdisciplinary Journal of e-Skills and Life Long Learning*, 12, 123-143. Retrieved from <http://www.informingscience.org/Publications/3452>
28. Wang, S. & Vasquez, C. (2012). *Web 2.0 and second language learning: What does the research tell us?* CALICO Journal, 29(3), 412-430.
29. White, H. & Shagun, S. (2014). Quasi-experimental Design and Methods, Methodological Briefs: Impact Evaluation 8, UNICEF Office of Research, Florence. Retrieved on January 20, 2018 from <http://www.unicef-irc.org/KM/IE/>.
- Ziegler, S. (2007). The (mis)education of generation m learning. *Media and Technology*, 32(1), 69-81.