

Perceptions of Inquiry Based Learning in SMASSE INSET in Students' Academic Achievement in Physics in Merti Sub- County, Kenya.

Kelvin Gwiyanga Misoga, Evanson M. Muriithi, Boniface Ngaruiya

Faculty of Education, University of Nairobi, Kenya

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ABSTRACT

Inquiry Based Learning Approach (IBL) is a student centered approach which prompts learners thinking through asking of questions, problems and presentation of real life situations. The objective of the study were: to determine how critical thinking skills taught in SMASSE influenced students academic achievement in physics in Merti Subcounty; to determine how students activeness in class taught in SMASSE influences students academic achievement in Physics; to determine how group activities and learner participation in class as taught in SMASSE influences student academic achievement in Physics in Merti subcounty, Kenya .The study employed descriptive survey research design and targeted two(2) SMASSE trainers, 8 physics teachers and 170 physics students. The research used simple random sampling in selecting the 170 students from the eight (8) sampled schools. The data was analysed using descriptive statistics. The findings show that SMASSE trainers perception mean was 4.64 as compared to physics teachers 4.14 and students 4.06 implying that the trainers strongly agree while the teachers and students agree that IBL approach taught in SMASSE INSET influences students academic achievement in Physics. Correlation analysis results showed that there was a strong positive relationship between Critical thinking skills taught in SMASSE INSET and student's academic achievement in Physics with R-value of 0.718 significant at 95% confidence level ($P=0.000$). Students activeness had a correlation value of 0.937 which is significant at $P=0.000$ at 95% confidence level. This shows a very strong positive relationship between students' activeness in class and students' academic achievement in physics. Group activeness and learner participation in class had a correlation value of 0.943 ($p=0.000$) at 95% confidence level which signified a very strong positive relationship between student group activities taught in SMASSE INSET and student's academic achievement in physics. The study recommended that the Ministry of Education and CEMASTEAs should increase the frequency of physics teachers SMASSE INSET to enhance positive results of the school.

Keywords: IBL, Physics, academic performance, SMASSE

BACKGROUND INFORMATION

The Inquiry Based Learning approach (IBL) is a very significant approach in teaching and learning of Mathematics and science subjects. This approach offers the learners an opportunity to own the learning process by adopting the 5E instructional model which incorporates engagement, exploration, explanation, elaboration and evaluation activities. Various studies show that IBL approach is significant in the teaching of physics curriculum. A study done by Aparicio-Ting, Slater, & Kurz (2019) on IBL as a key element of curriculum implementation proves that the approach develops learners' high order thinking skills which are essential in learner's innovation, critical thinking, research skills and creativity. The use of IBL approach in the classroom develops learners' scientific literacy skills which contributes to learner academic achievement

in sciences (Romero-Ariza, Quesada, Abril, Sorensen, & Oliver, 2020). Other studies show that IBL approach promotes student's activeness in the classroom during learning (Husni, 2020). According to Husni (2020) learners exposed to IBL approach are very responsive, enthusiastic, inquisitive, and have ability to discover new knowledge (Husni, 2020). This implies that if teachers of physics embrace the use of the IBL approach, there will be improvement in learners' attitude towards some challenging concepts in the subject content. Enebechi (2021) also found out that IBL approach increases students' retention and understanding of science concepts.

The Inquiry-Based Learning (IBL) approach, which is a student-centered, investigative approach to learning, can have a positive impact on academic achievement in physics. IBL is based on the idea that students learn best when they are actively engaged in the learning process, and when they are given the opportunity to explore and discover concepts on their own. CEMASTEIA (2021) elaborates that in IBL physics classroom, students are typically presented with an open-ended problem or question, and are then encouraged to work collaboratively to design and conduct experiments, collect and analyze data, and develop their own explanations and solutions. This approach helps students develop important skills, such as critical thinking, problem-solving, and communication, which are essential for success in physics and other STEM fields. Additionally, IBL provides students with a deeper understanding of physics concepts leading to improvement in learner academic achievement.

Various studies have been carried out on the influence of Inquiry based learning approach both nationally and internationally with most findings showing its influence on the learning. A study carried out in Turkey on 90 6th grade learners by Duran & Dökme (2016) on the effect of IBL approach on learners critical thinking skills found out that development of learner's activities using the IBL approach significantly affects learners critical thinking skills in learning of Science and technology. This finding agrees with another study carried out in University of Hawaii School of Nursing, United States of America by Magnussen, Ishida & Itano (2000). The study aimed in determining if IBL approach enhances critical thinking of the students by using patient problems. By grouping 228 and 257 first and final semester students respectively into stratified groups, the learners in the lower group had a significant increase in mean score as compared to those in the higher group which had a significant drop in mean score. The study therefore concludes that exposing learners to IBL approach develops learner critical thinking skills which increase their ability to solve complex problems (Magnussen, Ishida & Itano, 2000). Wale & Bishaw (2020) suggests that IBL model should be highly embraced by instructors due to its ability to increase learner's critical thinking skills. Their study which implored a quasi-experimental design concludes that IBL approach enhances learner's interpretation, analysis, evaluation, inferences, explanations, which are core critical thinking skills (Wale & Bishaw, 2020)

IBL approach promotes student's activeness in the classroom during learning. A study carried out in Indonesia by Husni (2020) on the effect of IBL approach on learning activities in religious subjects concludes that IBL approach increases learner's activeness during the teaching and learning process. The study used an experimental research design with pretest and posttest control groups. The groups which were exposed to IBL approach became very responsive, enthusiastic, inquisitive, and discovered new knowledge (Husni, 2020)

In Nigeria, a study carried out on influence of IBL approach on learner's retention in Biology by Enebechi (2021) highlights the significance of the IBL approach over other conventional approaches. The findings of the study show that the IBL approach increases students' retention and understanding of science concepts.

In Kenya, a study carried out by Nzomo, Rugano, Njoroge, & Gitonga (2023) shows a strong positive correlation ($r = 0.903$) between IBL and learner academic achievement in Chemistry. The findings of this study agree with Kunga (2021) which found out that inquiry-based learning approach is effective in improving learners academic achievement in physics. These studies summarize that the IBL approach is

effective in teaching science and mathematics subjects. Effective implementation of this approach has a significant impact on the academic performance of learners especially in physics subjects. However, this approach needs to be infused with other teaching approaches for effectiveness.

Research Objective

The objective of this study was to determine the influence of the use of Inquiry Based Learning approach covered in SMASSE INSET on students' achievement in Physics in Merti Subcounty, Kenya.

Research question

How does the use of Inquiry Based Learning approach covered in SMASSE INSET affect students' academic achievement in physics?

Significance

The findings of this study are expected to be used by the TSC Teacher Professional Development and CEMASTEAM task-force in finding out better approaches to be used in in-service training.

Theoretical framework

The study was guided by constructivist theory by Jean Piaget. The SMASSE in-service training focuses much on student centered approaches that require students to carry out activities like experiments, make observations and explain the observation. This links the SMASSE INSET with the constructivist theory which advocates that learners should be allowed to freely interact with surrounding objects for acquisition of knowledge (Fernando & Marikar, 2017)

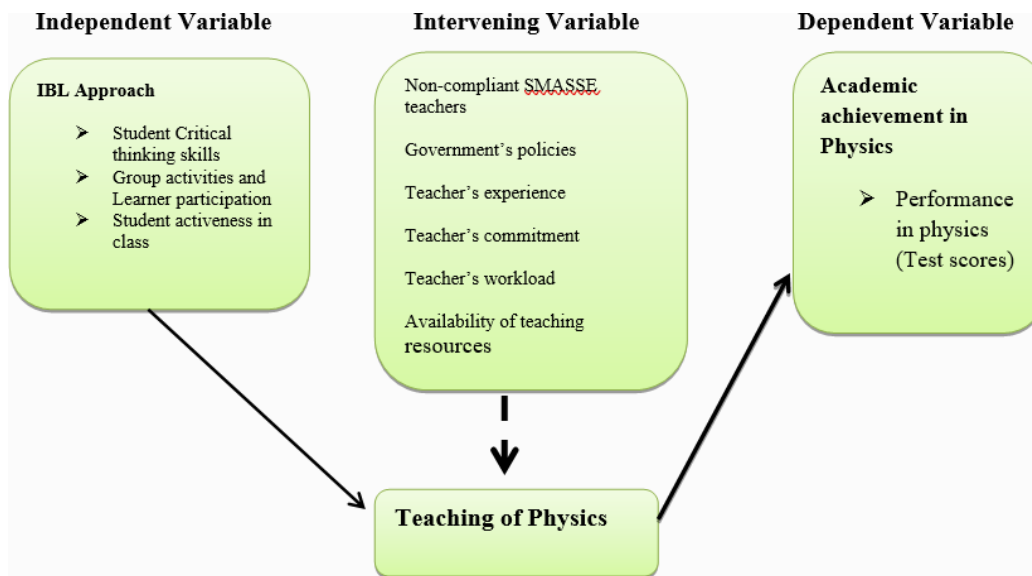
Constructivism or constructivist learning theory supports the idea that learners are able to construct knowledge for themselves (Hein, 1991). Constructivists strongly believe that learners are able to construct their own knowledge from their experiences within their environment. Zahorik (1995) asserts that constructivist theory supports the teaching process by equipping the teachers with strategies that enhance learner development of knowledge based on their personal life experiences.

IBL approach also encourages students to contribute to the learning process by contributing to the knowledge being taught. Hifarianti (2019) finds that the IBL approach becomes more effective when blended with constructivism. This means that, for teaching to become learner centered the learners need to construct their own knowledge relevant to what is being taught.

Conceptual Framework

The link between independent, dependent, and intervening factors is depicted in the theoretical framework. Dependent variables are those that are influenced by external factors, such as strong academic achievement, students' enthusiasm for physics, and learner involvement in the subject. Independent variables, however, are unaffected by other factors. The independent variables include Learner critical thinking skills, learner activeness in class and group activities and learner participation. The dependent variable of the study is students' academic achievement in Physics. On the other hand, the intervening variables are those which interfere with other variables. They include; Non-compliant SMASSE teachers, Government's policies, Teacher's experience, Teacher's commitment, Teacher's workload, Availability of teaching resources. The variable was controlled to avoid them affecting the dependent variable. For government policies, the study considered teachers who had attended the SMASSE INSET at least 2 years. Those who didn't attend were not considered in the study. Considering teachers experience, the study considered different teaching experience and workload. To control the influence of teaching resources on the dependent variable, schools

of different resources ability were selected.



RESEARCH METHODOLOGY

The study used descriptive survey design where questions in a questionnaire were presented to a target population in person. Sahin & Mete (2021) asserts that descriptive research design involves use of questionnaires and personal interviewing. According to Orodho, (2009) the descriptive design is effective in gathering data on individual's attitudes, opinions and habits on various educational issues. Descriptive design is appropriate for this study because the study aims to describe the subjects under study without altering or affecting them. According to Mugenda & Mugenda (2008) a population is defined as group, objects or individual specifications which have common characteristics. The target population comprised of two (2) SMASSE county Trainers, and eight (8) SMASSE trained Physics teachers and 170 form 2, 3 & 4 secondary school physics students in Merti Sub-County. The Sub-county comprises of 8 (eight) secondary schools; 2(two) of them double streamed and 6(six) single streamed. The total population of the students in the Sub-county is 1500.

The study used simple random sampling in selection of samples to avoid biasness and provide equality in representation of subgroups in the sample (Olken & Rotem, 1986). 170 students were sampled from the secondary schools in Merti sub-county where 62 students came from two streamed schools and 18 from each of the remaining 6 schools. One physics teachers was sampled from each of the 8 schools. Systematic random sampling was used in obtaining students to participate in the study where learners were chosen from the physics class register. This is because systematic random sampling is very ideal in collection of data where there is very little chance of data manipulation (Etikan & Bala, 2017). Mugenda & Mugenda (2003) defines validity as the extent to which the data obtained for analysis represents the phenomenon under study. Validity is the accuracy of the collected information which promotes accuracy in making meaningful inferences. One research specialist from the Department of Educational Communication Technology and Pedagogical Studies of University of Nairobi validated the instruments used in data collection. Three secondary school physics teachers and one county physics SMASSE trainer assisted in content validation of the instruments.

Faenkel & Wallen (2000) defines reliability of an instrument as how suitable an instrument is over time (its level of consistency). Piloting of the research instruments was done in the neighboring sub counties of Merti sub-county to estimate their reliability. The main aims of piloting were to identify any challenges that may occur when administering the research instruments and for checking the clarity of items in the instrument.

Mugenda & Mugenda (2003) proposes the pilot sample size to be 1% to 10% of the sample size. Therefore, two teachers, one trainer and 10 students were used for piloting. A reliability coefficient was computed using Pearson –product moment correlation coefficient. The following alpha coefficients were obtained. For trainer’ questionnaire, the Cronbach alpha was 0.79, for students 0.82 while that for the physics teachers was 0.87. Since these coefficients were above the required threshold of 0.7 according to (Mugenda and Mugenda, 2003), it indicated that the instrument was reliable. Descriptive and inferential statistics were used in this study. The resultant data was presented in frequencies and percentages, means and standard deviation so as to answer the research questions. SPSS version 20.0 for windows package was utilized in the analysis of the information gathered from the respondents. The data collected was summarized, organized and presented in form of tables.

RESULTS AND DISCUSSION

Students’ academic performance in physics in Merti sub county, Kenya

The table below shows the data collected from SMASSE trainers, physics teachers and physics students.

Table 1.0 Students academic achievement in physics

| Statements | TRAINERS (N=2) | | TEACHERS (N=8) | | STUDENTS (N=157) | |
|--|-------------------|----------|-------------------|----------|---------------------|----------|
| | Mean | Std. Dev | Mean | Std. Dev | Mean | Std. Dev |
| There is high academic achievement in physics in my school. | 2.00 | .000 | 2.00 | .756 | 2.10 | 1.334 |
| Students achieve highly in physics compared to other subjects | 1.50 | .707 | 2.38 | .518 | 2.24 | 1.046 |
| Most students perform well in physics | 2.00 | .000 | 2.13 | 1.126 | 2.54 | 1.380 |
| Physics records a positive deviation in every exam | 4.00 | .000 | 3.63 | 1.408 | 3.52 | .984 |
| Using learner centered approaches improves academic performance of physics | 4.50 | .707 | 3.50 | 1.604 | 3.85 | 1.205 |
| Use of Virtual laboratories, simulations, video clips and PowerPoint presentations encourage better performance in physics | 5.00 | .000 | 3.50 | 1.069 | 4.09 | 1.313 |
| Peer support affects performance of physics positively | 4.00 | .000 | 4.12 | 1.126 | 3.92 | 1.377 |
| A teacher with good mastery of physics content produces high academic performance among students | 5.00 | .000 | 3.63 | .744 | 4.18 | 1.222 |

According to descriptive statistics majority of the trainers, physics teachers and students disagree with a mean of 2.00, 2.00 and 2.10 respectively that their schools have high performance in physics. They also disagree with the statement that students perform highly in physics compared to other subjects offered in their schools (mean of 1.50, 2.38 and 2.24 respectively). The trainers and teachers disagree with a mean of 2.00 and 2.13 respectively that most of the students perform well in physics. However, the students are neutral (mean = 2.54) on whether they perform well in physics.

All the respondents having a mean of 4.00, 3.63 and 3.52 respectively agree that physics subject records positive deviation in every exam. When the respondents were asked if learner centered approaches improve

academic performance of physics in their schools, the trainers strongly agreed with a mean of 4.50 while majority of the teachers and students agreed with a mean of 3.50 and 3.85 respectively. The physics county trainers in Merti subcounty strongly supports (mean=5.00) the use of virtual laboratories, simulations, video clips and PowerPoint presentation in improving the academic achievement in physics. The teachers and students’ respondents agreed with the opinion with a mean of 3.50 and 4.09 respectively

According to the descriptive statistics in the table, all the respondents agree that peer support positively affects academic performance in physics with a mean of 4.00, 4.12 and 3.92 respectively. The county SMASSE INSET trainers strongly agree (mean = 5.00) that a teacher with good mastery of physics content produces high academic performance among the students. However, the teacher and students’ respondents agreed with the opinion with a mean of 3.63 and 4.18 respectively

Influence of Inquiry Based Learning approach and Students Academic Achievement in Physics

The objective of the study was to determine influence of the Inquiry Based Learning approach covered in SMASSE INSET on students’ achievement in Physics in Merti sub-county. The opinions of the trainers, teachers and students regarding this variable were obtained depending on the agreement with various statements on IBL approach. The findings were recorded in the table. The level of agreement of the statements was measured using a5-point Likert scale with strongly agree having the highest rating (5) and strongly disagree with the lowest rating (1)

Table 2.0: Agreement statements on IBL approach

| SMASSE TRAINERS VIEW (N=2) | Mean | Std. Dev |
|--|-------------|-----------------|
| SMASSE trains teachers on effective teaching through leaner centered activities | 4.50 | .707 |
| IBL approach taught in SMASSE focuses on enhancing learner critical thinking skills | 5.00 | .000 |
| IBL approach taught in SMASSE aims at improving learner activeness in class | 4.00 | .000 |
| SMASSE trains teachers on IBL activities which enhance student’s retention and understanding of science concepts | 5.00 | .000 |
| SMASSE INSET encourages group activities which enhance learner participation in class | 5.00 | .000 |
| SMASSE INSET emphasizes on effectiveness of IBL approach over other traditional approaches | 5.00 | .000 |
| The use of IBL approach increases students’ academic achievement in physics | 4.00 | .000 |
| TEACHERS VIEW (N=8) | Mean | Std. Dev |
| Effective teaching can be achieved through leaner centered activities | 4.38 | 1.061 |
| IBL approach enhances learner critical thinking skills | 3.63 | .916 |
| IBL approach makes make my learners to be active in class | 4.25 | 1.165 |
| IBL activities enhance student’s retention and understanding of science concepts | 4.75 | .463 |
| Group activities enhance learner participation in class | 3.50 | 1.414 |
| IBL approach is effective than other traditional teacher centered approaches. | 4.50 | .535 |
| The use of IBL approach increases students’ academic achievement in physics | 4.00 | 1.069 |
| STUDENTS VIEW (N=157) | Mean | Std. Dev |
| Effective teaching can be achieved through leaner centered activities | 3.87 | 1.372 |
| My teacher gives me activities which enhances my critical thinking skills | 4.18 | 1.367 |
| Teachers method of teaching makes me active in class | 4.11 | 1.286 |
| My teacher gives activities which enhances retention and understanding of science concepts | 4.09 | 1.190 |

| | | |
|--|------|-------|
| My teacher gives group activities that enhance learner participation in class | 4.13 | 1.296 |
| My teachers' approach is effective than other traditional teacher centered approaches. | 3.80 | 1.185 |
| The use of IBL approach increases my academic achievement in physics | 4.27 | 1.004 |

According to the descriptive statistics, it was established from the table 4.11 that majority of the trainers strongly agreed that they train teachers on effective teaching through learner centred activities as shown by a mean of 4.50, that IBL approach taught in SMASSE focuses on enhancing learner critical thinking skills as shown by a mean of 5.00. According to Monari (2018), in-service trainings equips teachers with methods that increase learner activeness through interactive activities. The finding by Monari (2018) supports the finding of this study that IBL approach taught in SMASSE aims at improving learner activeness in class as shown by a mean of 4.00. The study also found out that SMASSE trains teachers on IBL activities which enhance student's retention and understanding of science concepts as shown by a mean of 5.00. This is supported by a research carried out by Hamdan, Salleh, Shahrill & Asamoah (2022) which found out that IBL activities significantly influences retention and understanding of concepts in a flipped classroom. Finally, the study also found out that SMASSE INSET encourages group activities which enhance learner participation in class as shown by a mean of 5.00, that SMASSE INSET emphasizes on effectiveness of IBL approach over other traditional approaches as shown by a mean of 5.00 and The use of IBL approach increases students' academic achievement in physics by a mean of 4.00

It was established from Merti sub-county physics teacher respondents that effective teaching can be achieved through leaner centered activities as shown by a mean of 4.38, Majority of the respondents agree that IBL approach enhances learner critical thinking skills as shown by a mean of 3.63. These findings agree with a research done by Duran & Dökme (2016) which found out that learner centered activities improve critical thinking skills. This clearly implies that when learners are exposed to activities frequently, they are likely to improve their critical thinking skills. The teacher respondents also agree that IBL approach makes learners to be active in class as shown by a mean of 4.25. This implies that learner activeness in class depends on the teacher's strategies. However, when trying to establish a relationship between IBL approach and student's retention, majority of the respondents strongly agree that IBL activities enhance student's retention and understanding of science concepts as shown by a mean of 4.75 indicating that a large number of physics teachers in Merti Sub-county support the effectiveness of IBL approach on students retention and understanding of physics concepts. The study also established that the respondents agree that group activities enhance learner participation in class as shown by a mean of 3.50. A mean of 3.5 isn't very large implying that even though majority agree, there is still a significant number of teachers who are neutral or disagree with this item. However, a study carried out by Ismail, Bungsu & Shahrill (2023) agree that group activities enhances learner participation as they freely interact with each other when performing the activities. Lastly, the teacher respondents strongly agree that IBL approach is effective than other traditional teacher centered approaches as shown by a mean of 4.50 and the use of IBL approach increases students' academic achievement in physics as shown by a mean of 4.0. Napitupulu (2023) cites that there is a strong positive relation between inquiry-based learning approach and learner academic achievement. This implies that effective use of IBL approach over other traditional approaches can positively influence the performance of physics in Merti subcounty.

According to the student's perception on inquiry-based learning approach in table 4.11, most students agreed that effective teaching can be achieved through leaner centered activities with a mean of 3.87, this is a clear indication that learners in Merti sub-county prefer teachers using learner centered approaches. The learners agree that their teachers give out activities that enhances their critical thinking skills as shown by a mean of 4.18. On the other hand, the student respondents also agree that the teacher's methods of teaching make them active in class as shown with a mean of 4.11. This finding implies that the physics teachers in Merti sub-county apply the new approaches they learn in the SMASSE INSET. Majority of the respondents also agreed that their teachers gives them activities which enhances retention and understanding of science

concepts as shown by a mean of 4.09. Furthermore, when the respondents were asked on their participation in learning, a high number of students agreed that their teacher gives them group activities which enhance their participation in class as shown by a mean of 4.13. According to Brown (2023), learner centered approaches are more effective than traditional teacher centered approaches. This supports the finding of this study where majority of the respondents agree that the teachers’ approach is effective than other traditional teacher centered approaches as shown by a mean of 3.80. Finally, the student respondents agreed that the use of IBL approach increases their academic achievement in physics as shown by a mean of 4.12. In conclusion, the findings agree with Duran & Dökme (2016) which postulates that using the IBL approach significantly affects learner’s critical thinking skills in learning of Science and technology. Husni (2020) also agrees with the findings that IBL approach increases learner’s activeness. The findings of this study also agreed with Kunga (2021) which found out that inquiry-based learning approach is effective in improving learners academic achievement in physics.

Correlation analysis

The study used inferential statistics to establish a relationship between the variables. The questionnaires obtained responses based on a Likert scale with 5-point rating for all the items. All the means of academic performance, critical thinking skills, student activeness in class, group activeness and learner participation covered in SMASSE INSET were converted to composite scores of their means which enabled analysis of the inferential statistics. The average mean of 2 trainers, 8 physics teachers and 157 students’ questionnaires were obtained. The table below shows the composite scores of the study variable means.

| Variable | N | Mean | Std. Deviation |
|---|-----|------|----------------|
| Student’s academic achievement | 167 | 3.32 | 1.506 |
| Students critical thinking skills covered in SMASSE INSET | 167 | 4.26 | 1.270 |
| Student activeness in class taught in SMASSE | 167 | 3.80 | 1.225 |
| Group activities and learner participation taught in SMASSE | 167 | 3.74 | 1.247 |
| Valid N (listwise) | 167 | | |

The study used Pearson product moment correlation coefficient determine the relationship between the study variables. In order to answer the research questions Pearson Correlation analysis was conducted using SPSS software The correlation analysis was conducted at 95% confidence level and was two-tailed as the independent variables could influence students’ academic achievement negatively or positively

Table 4.16: Correlation between SMASE INSET and students’ academic achievement in physics

| Variables | | Students’ academic achievement in physics |
|--------------------------|---------------------|---|
| Critical thinking skills | Pearson Correlation | .718** |
| | Sig. (2-tailed) | .000 |
| | N | 167 |
| Students activeness | Pearson Correlation | .937** |
| | Sig. (2-tailed) | .000 |
| | N | 167 |
| Group activities | Pearson Correlation | .943** |
| | Sig. (2-tailed) | .000 |
| | N | 167 |
| | Sig. (2-tailed) | .000 |
| | N | 167 |

Table 4.16 shows that there was a strong positive relationship between Critical thinking skills taught in SMASSE INSET and student's academic achievement in Physics with R-value of 0.718 significant at 95% confidence level ($P=0.000$). Students activeness had a correlation value of 0.937 which is significant at $P=0.000$ at 95% confidence level. This shows a very strong positive relationship between students' activeness in CLASS and students' academic achievement in physics. Group activeness and learner participation in class had a correlation value of 0.943 ($p=0.000$) at 95% confidence level which signified a very strong positive relationship between student group activities taught in SMASSE INSET and student's academic achievement in physics.

SUMMARY AND CONCLUSION

Summary

The study aimed at determining the influence of the use of Inquiry Based Learning approach covered in SMASSE INSET on students' achievement in Physics in Merti Subcounty, Kenya. The study used descriptive survey research design. The target population of the study consisted of two (2) SMASSE County Trainers, eight (8) physics teachers employed by Teachers Service Commission who have attended SMASSE INSET cycle and 170 form 2, 3 and 4 secondary school students in Merti sub-county. The study used simple random sampling in selection of samples to avoid biasness and provide equality in representation of subgroups in the sample (Olken & Rotem, 1986). 170 students were sampled from the secondary schools in Merti sub-county where 31 students were sampled from two-streamed schools and 18 students from the remaining 6 schools in the subcounty. Systematic random sampling was used in obtaining students to participate in the study where learners were chosen from the physics class register. This is because systematic random sampling is very ideal in collection of data where there is very little chance of data manipulation (Etikan & Bala, 2017).

The research instrument was piloted using the test retest technique and a Pearson correlation coefficient computed. The refined instruments were administered, filled and responses analyzed. The study applied the use of primary data collection technique. This was achieved through the use of questionnaires. Data from questionnaires were analyzed quantitatively using descriptive and inferential statistics. The Descriptive analysis generated data which were presented in tables. Statistical Package for Social Sciences (SPSS) version 21.0 was used to aid in data analysis.

The results showed that effective teaching can be achieved through learner centered activities. The results established that IBL approach enhances learner critical thinking skills, activeness in class, retention and understanding of science concepts. The results further showed that students group activities enhance learner participation in class. The results also showed that IBL approach is effective than other traditional teacher centered approaches and the use of IBL approach increases students' academic achievement in physics

Inferential statistical results from Pearson's Product-Moment Correlation also show that IBL approach taught in SMASSE INSET and student's academic achievement in physics in Merti sub-county have a strong and significant positive correlation.

RECOMMENDATIONS

The study recommended that Physics Teachers should implement fully the Inquiry based learning model to improve learners' academic performance. The study further recommends that the ministry of education, Teachers Service Commission and CEMASTEIA should increase the frequency of physics teachers attending

SMASSE INSET to enhance positive results of the schools. Since Merti subcounty is in ASAL region having very small number of secondary schools and physics teachers, the study further recommends similar studies to be carried out in other areas to establish the case in the regions.

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