# ACADEMIC PERFORMANCE OF GRADE 8 LEARNERS IN SCIENCE USING LECTURE METHOD AND INTERACTIVE COMPUTER SIMULATIONS IN THREE PUBLIC SECONDARY SCHOOLS IN THE DIVISION OF EASTERN SAMAR

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## Abstract

This study determined the pedagogical effectiveness of interactive computer simulation in teaching science to grade 8 learners in three public secondary schools in the Nothern part of the division of Eastern Samar namely: Alugan National School of Craftsmanship and Home Industries, Nicasio Alvarez Memorial National High School, and Samar National Pilot Opportunity School of Agriculture. The use of interactive computer simulation was compared against the use of lecture method in teaching the topics Particle Nature of Matter, Particle Model of the Three States of Matter, Changes between Liquid and Gas, Changes between Solid and Gas, and Atoms: Inside Out. The data gathered from 150 respondents among the three schools through a 40-item teacher-made test were analyzed using the mean, Kruskal-Wallis H Test, and t-test on independent means. The pre-test means showed that there is no significant difference between the control and the experimental groups in terms of their initial knowledge on the topics studied. On the contrary, the groups' posttest mean scores differ significantly in favor of the experimental group who were taught using interactive computer simulation. Consequently, the same group yielded the highest learning gain mean score. The Kruskal-Wallis H-Test results revealed that there is no significant difference in the posttest, and learning gain mean scores among the three secondary schools within the control and experimental groups. The hypothesis of this investigation claiming that there is no significant difference of posttest mean scores between the control and experimental groups in the three secondary schools was rejected as revealed by the t-test p-value of .000 which is less than the critical value of 0.05. The t-test p-value of .000 for the learning gain mean scores of the control group and the experimental group rejected the null hypothesis which states that there is no significant difference of the learning gain mean scores between the control and experimental groups. Reflecting on the findings and conclusions of this study, the following are recommended: Teachers should use interactive computer simulation in teaching the topics used in this study than pure lecture. The use of interactive computer simulation in teaching science should be carefully matched with the content and desired learning outcomes. Mismatch between these three elements may put our learners at a disadvantage. Finally, future researchers can investigate the pedagogical effectiveness of interactive computer simulation in other fields of learning.

Keywords: Interactive computer simulation, ICT integration in teaching, 21st century Pedagogy

## I. INTRODUCTION

In a global partnership, the Philippines joins with other United Nations Member States in 2015 towards promoting lifelong learning opportunities for all in the 2030 Agenda for Sustainable Development through inclusive and equitable quality education.

With this commitment, the Philippines, through the Department of Education (DepEd) implemented the K to 12 Program through Republic Act No. 10533 or Enhanced Basic Education Act of 2013 to provide every Filipino graduate greater chance to succeed the anticipated global challenges.

In the enhanced curriculum, DepEd promotes the integration of ICT in all learning areas as a means for greater interactivity, broadening the ways of acquiring knowledge that will develop learning, and for improving “skills in accessing, processing and applying information, and in solving mathematical problems and conducting experiments” (BEC, 2002, p. 15).

To realize the foregoing objectives, DepEd invested in ICT infrastructure projects. In 2012, the department provided laboratory packages to secondary schools with 10 to 50 desktop computers through the DepEd Computerization Program (DCP) (DO 78, s. 2010). Equipped with educational programs, these computers aid students in developing computer skills as well as in leveraging teacher’s instructional activities. To compliment DCP in its implementation, DepEd Internet Connectivity Project (DICP) was launched. This aims to connect all public schools to the worldwide Web (DO 50, s. 2009) and provide learners with broader access to educational materials. Relevant trainings for teachers were also conducted to effectively utilize these ICT investments.

However, few years after the DCP and DICP have been implemented; the Education for All 2015 National Review Report revealed that the quality of Philippines basic education is still far from achieving the national standards. In fact the average NAT Mean Percentage Score (MPS) of all public and private high schools for school years 2011-2014 was pegged at 50% where Science tailed with an average MPS of only 41.35% (DepEd-NETRC).

Locally, learners’ underperformance in science is also evident. For the past three school years (2012 – 2015), majority of the secondary schools in the Division of Eastern Samar scored below the minimum national performance standards which resulted to an average Division NAT-MPS in Science of only 49% (Institutional Performance Profile Report, 2015).

Empirical survey conducted revealed perennial problems behind the low performance in science of Filipino students like inadequate or even lack of laboratory rooms and apparatus that hinders learners from performing actual experiments (DOST-SEI & UPNISMED, 2011). Moreover, despite the availability of ICT tools and facilities in schools several educators continue to use the “transmissive” approach in teaching science (iGOVPhilippines 2017 Annual Report).

Underpinned by constructivist theories of teaching and learning where learners are believed to achieve greater learning when they are allowed to discover and explore things by themselves, the availability of interactive computer simulations like PhET (Physics Education Technology) seems to be a natural fit in promoting active learning in science(Ardac & Akaygun, 2004; Honey & Hilton, 2011). This will also aid teachers in teaching students difficult topics but are critical for understanding important science concepts.

Fueled with strong passion to alleviate the persistently low achievement of Filipino learners in science, the researcher became interested on investigating the pedagogical effectiveness of interactive computer simulation like PhET in teaching least mastered competencies in science with the hope of achieving positive outcomes.

## II. METHODOLOGY

### Research Design

This study assessed the academic performance of grade 8 learners in science using interactive computer simulation in three public secondary schools at the Northern [art of the division namely: Alugan National School of Craftsmanship and Home Industries (ANSCHI), Nicasio Alvarez Memorial National High School (NAMNHS), and Samar National Pilot Opportunity School of Agriculture (SNPOSA).

This investigation employed the quasi-experimental method; specifically the two-group pre-test posttest design. In this design, each group was made to take a pre-test and a posttest separately using parallel instrument and under similar procedures. The pretest was administered prior to the implementation of the instructional interventions to measure the initial knowledge of the students of the topics to be discussed. After the experimental procedure, where the experimental and control groups were taught using PhET interactive computer simulations and lecture method respectively, a posttest was administered to assess the learning gains of the students of the topics included in the investigation.

Below is a diagram that summarizes this design.

| | | | |
|---|---|---|---|
| Control Group | $O_1$ | $X_0$ | $O_2$ |
| Treatment Group | $O_1$ | $X_1$ | $O_2$ |

The $X_0$ and $X_1$ in the diagram denote the two treatment variables for which each experimental group was subjected to. The pretest of both groups is represented by $O_1$ while the posttest by $O_2$ that was administered before and after each treatment respectively. The posttest mean scores of the experimental and control groups were compared using the t-test for uncorrelated or independent means to find out which group performed better.

### Locale of the Study

The study was conducted in three public high schools at the Northern part of division of Eastern Samar namely: Alugan National School of Craftsmanship and Home Industries (ANSCHI), Nicasio Alvarez Memorial National High School (NAMNHS), and Samar National Pilot Opportunity School of Agriculture (SNPOSA). Two of these schools, ANSCHI and SNPOSA are Technical-Vocational (Tech-Voc) High Schools found in San Policarpo, Eastern Samar; the former is situated at barangay Alugan of the said municipality. NAMNHS is a general secondary high school in San Eduardo, Oras, Eastern Samar. All three public high schools observed the heterogeneous sectioning. Additionally, these schools maintain functional computer laboratories equipped with fifty (50) desktop computers through the DepEd Computerization Program (DCP).

### Respondents of the Study

The respondents of this study are the Grade 8 learners under the K to 12 curriculum of the three identified public high schools. A total of one hundred fifty (150) respondents were purposively identified from all three public high schools. For the purpose of this study, 50 Grade 8 learners with final quarter 3 grade in science ranging from 76 to 85 were considered respondents from each of the three public high schools. From this number the control group and the experimental group were formed. The first group of 25 learners from each selected school served as the experimental group taught using the PhET interactive computer simulations in the school's computer laboratory. The other 25 learners from the same school served as the control group taught using lecture method in the traditional classroom. This grouping of respondents was observed in all three identified public high schools.

***Table 1. Respondents of the study in the Three Secondary Schools***

| School | Group | Sample Size |
|---|---|---|
| Alugan NSCHI | Experimental | 25 |
| | Control | 25 |
| Samar NPOSA | Experimental | 25 |
| | Control | 25 |
| Nicasio Alvares MNHS | Experimental | 25 |
| | Control | 25 |
| **TOTAL** | | **150** |

### Sampling Procedure

In this study, purposive sampling was used. Grade 8 learners from the three identified public high schools with quarter 3 grades in science that range from 76 to 85 were purposively selected as participants of the study.

To achieve fair representative samples for each group, learners from different sections in each school with same grade were paired and assigned separately to either the control group or the experimental group.

To illustrate further, a learner with a grade of 76 from one school was assigned to the experimental group while a learner from the same school who obtained the same grade was assigned to the control group. This process of pairing continued until the 25 participants per group was reached. The respondents of the study were coded according to their group classification as either control group or experimental group for a more convenient way of collecting data.

The researcher used this method of grouping to achieve a relatively homogeneous grouping where the learners' level of intelligence is more or less identical in both groups.

**Research Instrument**

A forty (40) item multiple choice teacher-made questionnaire with four options each was used to collect the pre-test and posttest scores of both the control group and experimental group. The test items covered the topics on Particle Nature of Matter; Particle Model of the Three States of Matter; Changes between Liquid and Gas; Changes between Solid and Gas, and Atoms: Inside Out. To ensure that a fair and representative sample of questions appear on the test, a table of specifications (TOS) was prepared following the K to 12 format.

Moreover, the researcher submitted the test material to Mr. Reynaldo Orisa, district Testing Coordinator of San Policarpo and at the same time the academic department head of Samar National Pilot Opportunity School of Agriculture (SNPOSA) for evaluation.

Concerned with the reliability of the instrument, a dry run was conducted to fifty (50) grade 8 learners from the two grade 8 sections of SNPOSA, namely: Basella alba and Momordica charantia whose final quarter 3 grade in science range from 76 to 85.

Using the responses of the students who participated in the dry run, all test items were subjected to item analysis using the DepEd prescribed Enhanced Classroom Data Gathering Tool (ECDGT). Result of the item analysis was used as basis in improving the research instrument.

**Data Collection Procedure**

The actual data gathering started after all pertinent requests for the conduct of the study were sought from all three public high schools involved in this study.

Data on the initial knowledge of the topics covered were collected through a pretest. A forty (40) items multiple choice test was administered personally by the researcher to both the control group and the experimental group during their regular class schedule and before any instructional intervention was implemented.

After the pretest, the formal and actual instruction using lecture method was conducted to the control group and interactive computer simulation in the experimental group by the respective Grade 8 science teachers of the respondents in the three public high schools who have been integrating ICT in their science classes.

The control group was taught in a traditional classroom using lecture method while the experimental group was taught in the computer laboratory using the appropriate PhET interactive computer simulation. For convenience of the other two science teachers, the researcher installed copies of the PhET computer simulations for the topics involved in their respective laboratory computers.

During the actual instruction, the learners in the experimental group was individually assigned a desktop PC that they used to interact with the PhET computer simulation appropriate for the topic in order to acquire and develop the science concepts and skills expected of them. The teachers served as facilitators in the experimental group and provided learners with technical assistance as need arises.

The experimental process covered a period of four weeks during the fourth quarter of school year 2018-2019 following this schedule: 7:15 – 8:15 A.M. for the control group and 8:15 – 9:15 A.M. for the experimental group from Monday until Thursday.

After the experimentation, a posttest was administered by the researcher to both the control and experimental groups. Similar test material was used and procedure parallel to the pretest was observed to keep other factors from affecting the results.

The effect of each treatment on the academic performance in science of grade 8 learners in both groups among the three schools, the posttest results were treated, analyzed, and interpreted from which the conclusions and recommendations were based.

The researcher together with the science teachers of NAMNHS and SNPOSA kept the classroom instructional activities and environment in both groups as naturally appearing as possible for more realistic results.

**Analysis of Data**

The study focused on assessing the academic performance of Grade 8 learners in science taught using Lecture Method and Interactive Computer Simulations of teaching.

To determine whether there is significant mean difference of the post-test and learning gain scores between the control and the experimental groups among the three schools, the t-test on independent means was used. The average learning gain score of each group was computed using the formula $\frac{Posttest-Pre-test}{100-Pre-test}\ x\ 100$.

A Kruskal Wallis H-Test was employed to determine if there is significant mean difference of posttest and learning gain scores among the three secondary schools within the control and experimental groups. Both statistical measures were set at 0.05 level of significance.

**III. RESULTS AND DISCUSSION**

**Learners' Performance in the Pre-test**

Prior to the actual investigation, the learners in both the control and experimental groups were made to take the pre-test using a forty-item teacher-made test. The learners' scores in the pre-test determine their initial knowledge of the topics used in the investigation.

Table 2 summarizes the pre-test mean scores of the learners in the control group before they were taught of the topics using lecture method and that of the learners in the experimental group before they were taught of the same topics using interactive computer simulations.

The recorded pre-test means of the control group show that the learners from SNPOSA with 11.76 scored a little higher than the learners from ANSCHI and NAMNHS with 11.64 and 11.16 respectively. The less than 1 unit mean difference in the pre-test of the learners in the three public secondary schools implies that the respondents were more or less equal in the level of their initial knowledge of the topics.

**Table 2. Pre-test mean scores of the control and the experimental groups**

| School | Control Group | | Experimental Group | |
|---|---|---|---|---|
| | Mean | Std. Deviation | Mean | Std. Deviation |
| ANSCHI | 11.64 | 2.612 | 12.68 | 3.976 |
| NAMNHS | 11.16 | 3.826 | 11.36 | 3.616 |
| SNPOSA | 11.76 | 3.345 | 11.76 | 3.503 |
| **Grand Mean** | **11.51** | **3.261** | **11.93** | **3.698** |

Table 2 also reflects the pre-test means of the experimental group. From these values, it can be noted that the learners from ANSCHI who got 12.68 had the highest mean their counterparts from SNPOSA and NAMNHS with 11.76 and 11.36 respectively. Further, the less than 1 unit mean difference within group, affords the researcher of the idea that the respondents in the experimental group have fairly equal level of prior knowledge of the topics included in the investigation.

The grand means of the control and experimental groups are also presented in Table 2. Although the experimental group had higher grand mean than the control group, the difference of 0.41 is insignificant to claim that one group is better over the other in terms of baseline knowledge of the topics to be studied.

**Learners' Performance in the Posttest**

Towards the end of this investigation the learners' academic performance in science was evaluated. A forty (40) item post-test was administered to the control and experimental groups to assess how far the learners in each group have learned after being taught of the topics using lecture method for the control group and interactive computer simulations for the experimental group.

Table 3 displays the posttest means of the control and experimental groups. Within the control group, it can be observed that SNPOSA with 20.48 had the highest posttest mean compared to NAMNHS and ANSCHI with 20.40 and 19.76 respectively. Evidently, the posttest mean values of the control group only differ by less than 1 unit. This minimal posttest mean difference proves that the learners in the control group have performed relatively equal in terms of their academic performance in science after being taught using lecture method

***Table 3. Post-test mean scores of the control and the experimental groups***

| School | Control Group (LM) | | Experimental Group (ICS) | |
|---|---|---|---|---|
| | **Mean** | **Std. Deviation** | **Mean** | **Std. Deviation** |
| ANSCHI | 19.76 | 4.841 | 23.80 | 2.930 |
| NAMNHS | 20.40 | 4.340 | 23.84 | 2.385 |
| SNPOSA | 20.48 | 2.903 | 23.04 | 5.160 |
| **Grand Mean** | **20.21** | **3.060** | **23.55** | **3.492** |

Meanwhile, the posttest means of the experimental group are also presented in table 3. The data obviously show that the learners that comprise the experimental group from the three public secondary schools faired fairly equal in the posttest after being taught using interactive computer simulation. Among the three schools, NAMNHS with a mean of 23.84 scored better than ANSCHI with 23.80 and SNPOSA with 23.04. Further, the slight posttest mean difference in the experimental group expresses the fact that the respondents benefited almost equal from the interactive computer simulation employed in teaching them.

Table 3 also shows the average posttest means of the control and experimental groups. As clearly shown, the latter achieved higher average posttest mean than the former by more than 3 units. This result suggests that learners who were exposed to interactive computer simulations performed better academically in science than learners who were taught using the lecture method for the entire experimentation period.

**Learning Gains of the Control and Experimental Groups**

The mean learning gain that each group obtained after the investigation describes the effectiveness of the pedagogical intervention for which each group was subjected to.

Reflected in table 4 are the learning gains of the control and the experimental groups. It can be observed from the given data that the control group obtained a mean learning gain of 32 percentage points out of the 100 percentage points that it can possibly get. This value indicates that LM, for which the group was taught improved the group's performance by 32 percentage points since the experimentation commenced. For the experimental group, a mean learning gain of 42 percentage points was obtained out of the 100 percentage points that they can possibly achieve. This value shows that ICS, for which the group was subjected to increase the group's performance by 42% since the experimentation started.

***Table 4. Mean learning gains of the control and the experimental groups***

| Group | Mean Learning Gain |
|---|---|
| Control Group (LM) | 0.32 or 32% |
| Experimental Group (ICS) | 0.42 or 42% |

These results therefore confirmed that ICS is more effective than LM in teaching the topics to more or less the same group of learners involved in this investigation.

**Kruskal-Wallis H Test on Significant Difference of Posttest and Learning Gain Mean Scores within the Control and the Experimental Groups**

The succeeding tables present the Kruskal-Wallis H Test results on the significant difference of the posttest, and learning gain mean scores within the control and the experimental groups. This statistical measurement was conducted to ascertain that the respondents in each group were taken from the same population, with more or less equal level of mental capability, hence, valid for the purpose of this investigation.

Summarized in table 5 are the results of the Kruskal-Wallis H Tests on significant difference of posttest mean scores of grade 8 learners within the control and the experimental groups after they were taught of the same topics using LM and ICS separately.

From the nearly equal posttest means of the three schools in the control group, a p value of 0.562 emerged which is significantly higher than the critical value of 0.05. Moreover, the result indicated a computed H-value of 1.151 which is less than the critical value of 5.991. Both p and H – values are interpreted as not significant. Consequently, the computed p and H values substantially confirmed that there was no significant difference of the posttest mean scores of grade 8 learners among the three public secondary schools within the control group.

***Table 5. Kruskal-Wallis H Test on significant difference of posttest mean scores within the control and the experimental groups***

| Group | H | df | p-value | Interpretation |
|---|---|---|---|---|
| Control Group | 1.151 | 2 | 0.562 | Not Significant |
| Experimental Group | 0.967 | 2 | 0.617 | Not Significant |

Significant at $\alpha$=.05

Interestingly, the posttest mean scores of the learners among the three schools taught using ICS differ by less than 1 unit only. Subsequent to the minimal posttest mean difference within the experimental group is a p-value of 0.617 which is greater than the significant level of 0.05 and an H-value of 0.967 which is less than the 5.991 critical value.

Objectively, the p and H values confirmed that all three public secondary schools within the experimental group benefited equally from the ICS method of teaching employed in teaching the topics.

Collectively reflecting from the computed p and H values within the control and the experimental groups, the first null hypothesis which states that there is no significant difference in the post-test mean scores in science within the control and the experimental groups is accepted.

Further, these results proved that the learners in the control group benefited from the LM almost equally. Similar trend was also observed in the experimental group where all the three schools exhibited nearly equal amount of learning of the topics after they were taught using ICS.

Table 6 outlines the results of the Kruskal-Wallis H Test on significant difference of learning gain mean scores in science within the control and the experimental groups.

The statistical result for the control group revealed a p value of 0.336 which is obviously greater than the critical value of 0.05 and a computed H – value of 2.179 which is less than the tabular H – value of 5.991.

These results implied that though all three schools within the control group progressed positively over the course of the investigation using LM, the difference in their mean learning gain scores is insignificant.

***Table 6. Kruskal-Wallis H Test on significant difference of mean learning gain within the control and the experimental groups***

| Group | H | df | p-value | Interpretation |
|---|---|---|---|---|
| Control Group | 2.179 | 2 | 0.336 | Not Significant |
| Experimental Group | 1.018 | 2 | 0.601 | Not Significant |

Significant at $\alpha$=.05

Shown in the same table is the Kruskal-Wallis H Test on significant difference of learning gain mean scores within the experimental group after being taught of similar topics using ICS.

As revealed in Table 6, the learning gain mean scores within the experimental group show very little variability.

As indicated in the table, the Kruskal-Wallis H Test yielded a p value of 0.601 which is apparently greater than the significant level of 0.05 and a computed H-value of 1.018 which is less than the tabular H-value of 5.991. These results manifest that the difference in the learning gain mean scores of the three schools within the experimental group is insignificant. Further, this justifies that all grade 8 learners among the three secondary schools benefited almost equally from the interactive computer simulation method used in teaching science.

Collectively, the p-value of 0.336 and H-value of 2.179 for the control group and the p-value of 0.601 and H-value of 1.018 for the experimental group confirmed the second null hypothesis which states that there is no significant difference in the learning gain mean scores in science within the control and the experimental groups. Hence, it is accepted.

**T-test on Independent Means Between the Control Group and the Experimental Groups**

The final set of statistical analyses utilized the t-test on independent means to ascertain whether there is significant difference on the academic performance of grade 8 learners in science taught using lecture method (control group) and using interactive computer simulation (control group) among the three public secondary schools.

Meanwhile, the independent sample t-test results on significant difference of post-test mean scores in science between the control and the experimental groups are presented in Table 7.

The results revealed that the post-test grand mean of 23.55 of the experimental group is greater than what their counterpart in the control group achieved by 3.34. This posttest mean advantage of the experimental group clearly shows that the learners taught using ICS scored way better in science than their counterpart taught using LM. Moreover, the difference of posttest mean scores between the control group and experimental group in favour of the latter was found to be significant at a p-value of .000 which is less than the significant level of 0.05.

***Table 7. T-test on significant difference of posttest mean scores between the control and the experimental groups***

| Group | Mean | p-value | Decision | Interpretation |
|---|---|---|---|---|
| Control | 20.21 | .000 | Reject $H_0$ | Significant |
| Experimental | 23.55 | | | |

*Significant at $\alpha$=.05*

Reflecting from this result, the third null hypothesis of this study which proposes that there is no significant difference of posttest mean scores in science between the control and the experimental groups is rejected.

Essentially, the use of ICS in teaching science particularly for the topics Particle Nature of Matter; Particle Model of the Three States of Matter; Changes between Liquid and Gas; Changes between Solid and Gas, and Atoms: Inside Out is more effective than LM.

Table 8 summarizes the independent sample t-test result on significant difference of learning gain mean scores in science between the control and the experimental groups. As reflected, the experimental group yielded a learning gain mean score advantage of almost 3 units (2.93) over the control group who obtained 8.69. The considerably higher learning mean advantage of the experimental group is directly associated to the pedagogical effectiveness of interactive computer simulation in teaching science towards which this study was conducted.

***Table 8. T-test on significant difference of learning gain mean scores between the control and the experimental groups***

| Group | Mean | p-value | Decision | Interpretation |
|---|---|---|---|---|
| Control | 8.69 | .000 | Reject $H_0$ | Significant |
| Experimental | 11.62 | | | |

Significant at $\alpha$=.05

Revealed also in Table 8 is the computed p-value of .000 which is less than the critical value of 0.05. Thus, the result was found to be significant. Hence, the fourth null hypothesis proposed in this investigation which asserts that there is no significant difference of learning gain mean scores in science between the control and the experimental groups was rejected. Moreover, this implies that the topics studied could be taught more effectively to Grade 8 learners using ICS rather than LM.

The findings of this investigation by and large conform to the findings of Trundle and Bell (2010) where students using a “Virtual Solar System” gained higher knowledge about astronomical phenomena compared to those taught in pure lecture. In another study, Huppert, Lomask, and Lazarowitz (2012) proved that using interactive computer simulation dealing with growth of microorganisms inside a conventional classroom provided high school biology students with exciting and safe learning experiences that helped them achieve significant improvement in class. Stern, Barnea, and Shauli (2008) similarly compared two groups of students; both were taught the kinetic molecular theory. The experimental group subsequently spent additional class periods using the computerized simulation, “A Journey to the World of Particles”. The students in the experimental group scored significantly higher than the students in the control group on a test measuring their understanding of the theory.

Various studies revealed that the pedagogical effectiveness of ICS comes from its ability to present complex yet fundamental science concepts that are very difficult to explain, impractical or too dangerous to run in the regular classroom. ICS also provides a suitable medium to test relationships between variables by altering parameters in a way they can receive feedback from the simulation after each attempt. With ICS, students see an animated motion instantly change in response to their self-directed interaction with the simulation. Based on what they observe the animation do, students engage in exploration and sense-making and build connections between the information provided by the simulations and their previous knowledge.

Another feature that boosts learners’ interest toward ICS is the fun experience while creating learning. The fun-looking (gamelike, interesting graphics, and non-threatening) presentation of the materials attracts learners’ interest that they want to try it out until its use becomes repeated and voluntary.

## IV. CONCLUSION

The results of the study led the researcher to a conclusion that interactive computer simulation is more effective than lecture method in teaching the chosen science topics. Its effectiveness steered from its ability to engage learners in self-directed exploration and sense-making with the concepts that the material presents that leads to higher level of learning. Moreover, the significant difference of learning gain mean scores between the control and experimental groups in favor of the latter essentially suggest that interactive computer simulation improved the academic performance of grade 8 learners in science in the three secondary schools more than lecture method used to teach the control group.

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