

# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY: APPLIED BUSINESS AND EDUCATION RESEARCH

2021, Vol. 2, No. 12, 1326 – 1337

<http://dx.doi.org/10.11594/ijmaber.02.12.04>

---

## Research Article

### Learning of Science among Students at Risk of Dropping out (Sardo) Using Technology-Driven Intervention

Mylene Amor Sayson Pañares<sup>1\*</sup>, Reggie Sayson Ybanez<sup>2</sup>

<sup>1</sup>Department of Education, Alabel National High School, 9501, Philippines

<sup>2</sup>Department of Education, Alegria National High School, 9501, Philippines

---

#### Article history:

Submission December 2021

Revised December 2021

Accepted December 2021

#### \*Corresponding author:

E-mail:

[gessellyn015@gmail.com](mailto:gessellyn015@gmail.com)

#### ABSTRACT

The purpose of this study was to determine the efficacy of Technology-Driven Intervention in improving science learning among Alegria National High School students at risk of dropping out. This study focused on two groups of twenty (20) Grade 8 Students at Risk of Dropping Out. Ten SARDOs served as the control group and received work text intervention, while the other ten SARDOs received technology-driven intervention. Both groups performed POORLY in Science knowledge at the start of the experiment, according to the results. T-test results also revealed that both the work text intervention and the technology-driven intervention were effective in the learning of SARDOs. The mean gain scores of SARDOs that used technology-driven intervention, on the other hand, were significantly higher. The study concludes that a technology-based intervention is more effective than a traditional intervention for students at risk of dropping out.

**Keywords:** Drop- Out Reduction Program, Computer-Based Instruction.

---

### Background of the Study

One of the goals of the science and technology course is to prepare students to keep up with the rapidly evolving and changing science world of today, as well as to be capable of applying the most recent technological advances (Serin, 2011). Furthermore, he considered computer-based instruction to be one of the most important technological devices of the time. Computer-based instruction (CBI) is defined as the use of computers in teaching and learning activities (Mosby's Medical Dictionary, 2009). In previous decades, Stetter (2010) and

Shelly G. et. al. (2012) believed that embracing computer technology has a profound impact on students' learning and how teachers teach in the classroom setting, making it a promising tool for frustrated learners.

Despite this, many teachers have little personal experience with computers and incorporating technology-based activities and projects into their curricula (Balmeo, 2014). In some schools in the Philippines, 60 percent of teachers know how to operate and use computers. Furthermore, only 2% of teachers use computers in the classroom for classroom

---

#### How to cite:

Pañares, M. A. S. & Ybanez, R. S. (2021). Learning of Science among Students at Risk of Dropping out (Sardo) Using Technology-Driven Intervention. *International Journal of Multidisciplinary: Applied Business and Education Research*. 2 (12), 1326 – 1337. doi: 10.11594/ijmaber.02.12.04

discussion (Bayaban, 2013). As a result, students performed worse academically and decided to drop out (Yi, et.al 2012, Wheeler, et al. 2015).

Despite the Department of Education's No Filipino Child Left Behind Policy (Villar, 2008) and Education For All 2015 (EFA), which require all schools to have zero drop-outs at the end of the school year, this is the case.

Indeed, one of the most difficult challenges that classroom teachers face today. As a result, the Department of Education created the Drop-Out Reduction (DORP) Program to reduce and re-engage dropout students while also improving students' basic education performance (DepEd Order No.74, s. 2010, Crisol, 2012). In 2011-2012, the survival rate at Alegria National High School was 1.26 percent (ANHS 2012), and the survival rate among Philippine secondary schools was 60 percent of the graduate class (Palanca, 2015). The use of technology-driven instruction in the teaching and learning process significantly contributed to the increase performance of the students (Ruedas, 2011 and Daus, 2013). However, there was no study on the effectiveness of using this tool as an intervention for students who are at risk of dropping out (SARDO) was conducted.

As a result, the purpose of this study was to determine whether instructional technology-driven intervention learning can help students who are at risk of dropping out. It also aims to assess not only content knowledge but also the necessary skills for implementing a 21st-century approach that will affect their careers, personal lives, and future.

### **Statement of the problem**

The study aimed to find out on the effectiveness of technology- driven intervention among students at risk of dropping out (SARDO) in learning science.

Specifically, this study answered the following questions:

1. What are the pretest scores of the students at risk of dropping out in the control and the experimental group?
2. Is there a significant difference in the pre-test scores of students at risk of dropping out in the control and experimental group?

3. Is there a significant difference in the pre-test and posttest of students at risk of dropping out in the control group?
4. Is there a significant difference in the pre-test and posttest of students at risk of dropping out in the experimental group?
5. Is there a significant difference in the mean gain scores of students at risk of dropping out in the control and experimental group?

### **Significance of the study**

The researcher was interested in determining the efficacy of using technology-driven intervention in learning science among students at risk of dropping out. As a result, it is hoped that the outcome will be of significant assistance to the following:

To the school administrator, Through the use of technology-driven intervention, this study would provide an idea for a better intervention program for students at risk of dropping out (SARDO). As a result, students' problems with learning sciences easily and effectively would be addressed.

To the Science teachers, this research would aid them in their mission by enhancing students' ability to keep up with modern technology as a new intervention in teaching and learning science. Not only in academic development, but also in fostering a positive attitude toward science knowledge in students who are at risk of dropping out.

To the Non- Science major teachers, this study would guide them the right concept in teaching science and would aid for better presentation thus, encouraging greater participation of students eradicating boredom to both teachers and learners.

To the parents, this study would encourage active participation in supporting allowing their sons and daughters to expose in a technology-based multi-sensory rich environment.

To the Students, this study would help them to realize that in the arena of science knowledge some extra effort is necessary especially in the field of sciences that positive perspective would matter in achieving higher grades through the aid of technology – driven intervention.

To the researcher, this study would provide her the fact that there is a better intervention in

facilitating learning among students who at risk for dropping out that can stimulate students' scholarly motivation and uphold positive perspective in science education through the use of technology-driven instruction.

### **Scope and Delimitation**

The study sought to ascertain the efficacy of using technology-driven instruction as an intervention in improving students' science learning among at-risk students (SARDO).

The research was limited to two groups of 20 Grade 8 SARDOs each. One group was made up of ten SARDOs as the control group, and the other was made up of ten SARDOs as the experimental group. The study concentrated on the ecosystem (Transfer of Energy in Trophic Levels, Cycling of Materials in the Ecosystem, Water cycle and Impact of Human Activities in an Ecosystem).

Technology-driven interventions include the use of a computer, an internet connection, and Microsoft PowerPoint for effective visual presentations, speakers for improved audio input and hearing effects, and video clips downloaded from YouTube.

The control group received work text-intervention and no technology-driven instruction, whereas the experimental group received technology-driven instruction in Science. The questionnaire used in the study was taken from the test banks and condensed from the EASE Project module, BEAM module, North Carolina Test of Biology, *Massachusetts Comprehensive Assessment System*, *California Standard Test* and *New York Grade 8 Intermediate-Level Test Science*.

### **Methodology**

This chapter describes the research methodology used in the conduct of the study. This study used the quasi-experimental design known as the pretest/posttest nonequivalent group design since only two groups were used in the study (Best and Kahn, 1998). This design is one of the most widespread designs used in the educational research which involve an experimental and control group. Two groups were used in the study. Purposive sampling was done to identify the ten (10) SARDOs of the experimental group and ten (10) SARDOs of the

control group. The lottery was used to determine which of the two sample classes belong to the experimental group or control group.

The subjects of the study consisted of twenty (20) Students At Risk of Dropping Out (SARDO) in Alegria National High school, Alabel, Sarangani Province. SARDOs are the students who stopped attending school before completing the prescribed level of education within the specified school year (Premarion, 2013). Operationally, this denotes the successive and habitual absences of the students that may be the causes of dropping out while Purposive sampling was done to identify the ten (10) SARDOs of the experimental group and ten (10) SARDOs of the control group. The lottery was used to determine which of the two sample classes belong to the experimental group or control group.

This study used the pretest and posttest in Science and technology-driven intervention were the two essential instruments of the study.

### **Pretest/Posttest**

The test questions were taken from EASE Project module, BEAM module, North Carolina Test of Biology, *Massachusetts Comprehensive Assessment System* and *New York Grade 8 Intermediate-Level Test Science* which paralleled to the lesson covered the planned topics in K-12 Science Curriculum Guide of the Department of Education, December 2013 version. Twenty items covered the selected topics on Ecosystems (Transfer of Energy in Trophic Levels, Cycling of materials in the Ecosystem, Water cycle and Impact of human activities in an ecosystem). The Pretest had the same content as the posttest. The items in the posttest were rearranged items of the pretest.

### **Technology-driven intervention**

It represents an educational tool that includes the utilization of TV, projector, computer set, internet connection and Microsoft Powerpoint efficient visual presentation, speakers for better audio inputs and good hearing effects and video clips downloaded from youtube (Thangarajathi, et al., 2012; Daus, 2013).

### **The experimental group**

The experimental group consisted of ten (10) SARDO's that hold special class in Science at 4:00- 5:00 in the afternoon. They were taught with the aid of technology-driven instruction (with the use of laptop and downloaded video clips) in Ecosystems (Transfer of Energy in Trophic Levels, Cycling of Materials in the Ecosystem, Water cycle, Impact of Human Activities in an Ecosystem). The researcher acted as facilitator of the experimental group all throughout the duration of the experiment.

At the start of the experiment, a pretest was administered within one hour in the first session. The lessons covered were paralleled with the planned topics in K-12 Science Curriculum Guide of the Department of Education, December 2013 version.

In teaching the experimental group, the following steps were followed:

1. The teacher introduced the lesson as a preliminary activity to the class based on the topics for 5 minutes. The researcher acted as a facilitator for the rest of the period.
2. To enhance the lesson presented and to stimulate students' interest, the students were the ones manipulated the computer by clicking "next" on the computer's keyboard or click the button "play" when watched a video clip that contained the desired topics. By that, SARDOs then discovered and learned by their capacity through performing the given task during the next 40 minutes including discussions and clarifications.
3. To evaluate students understanding for the particular lessons presented, the assessment was given for 10 minutes.

Following usual daily routine, the experiment was done for 3 sessions. After covering all the topics in the study, the posttest was administered in rearranged items, and the result was subjected to statistical analysis.

### **The control group**

The control group used worktext with the same context as that of the experimental group and without the use of technology-driven instruction.

In teaching the control group, the following steps were followed:

1. The teacher introduced the lesson as a preliminary activity to the class based on the topics for 5 minutes. The researcher acted as a facilitator for the rest of the period.
2. However, no computer hardware and software nor internet connection was used. Instead, a paper and ballpen were used for answering the module. SARDOs then discovered and learned by their capacity through performing the given activity during the next 40 minutes including discussions and clarifications.
3. To evaluate students understanding for the particular lesson presented, the assessment was given for 10 minutes.

### **Technology-driven**

The technology-driven instruction includes computer set, the internet and video clips downloaded from youtube. The downloaded video clips are aligned to the planned topics and learning competency based on K-12 Science Curriculum Guide of the Department of Education, December 2013 version.

### **Research procedure**

The following were the steps being performed by the researcher to achieve the objectives of this study:

#### **Preliminary Preparation**

The preparation involved the following tasks:

- A. Collection and Review of Related Resources  
This task involved the acquisition of necessary instruments (science questionnaires, online activities) and materials being used in the study. The topics and objectives are aligned with the learning competencies of K-12 Science Curriculum Guide, December 2013 version.
- B. Sought Permission to Conduct Research and Orientation

Before the first week of February 2016, the researcher sent a letter to explain the purpose of the study to the Schools Division Superintendent of Sarangani Division. And it was granted, then the researcher also asked permission from the principal of Alegria National High

School, Alegria, Alabel, Sarangani Province for the participation of the students in the study.

#### Test Administration

The 20-item Ecosystem Benchmark/Summative Assessment served as the pretest-posttest which was given to 20 Grade 8 Students At Risk of Dropping Out.

#### Group Population

Purposive sampling was done to identify the ten (10) SARDOs of the experimental group and ten (10) SARDOs of the control group. The students in each group were selected through a lottery. Then the group was assigned to the experimental group and the other as the control group.

#### Delivery of Instruction

The experimental group was exposed to Technology- driven instruction while the control group to the traditional method. Both groups were given same time duration of 30 - 60 minutes per session which was facilitated by the same teacher. The implementation of this research started last first week of February and ended on the first week of March 2016.

#### Statistical treatment

1. To determine if there is a significant difference in the pretest scores of students at risk of dropping out in the control and experimental group, t-test for dependent samples was used.

2. To determine if there is a significant difference in the pretest and posttest of students at risk of dropping out in the control group, t-test for independent samples was used.
3. To determine if there is a significant difference in the pretest and posttest of students at risk of dropping out in the experimental group, t-test for independent samples was used.
4. To determine if there is a significant difference in the mean gain scores of students at risk of dropping out in the control and experimental group, t-test for independent samples was used.

All tests were done at .05 level of significance.

### Results, Analysis and Discussion

This chapter presents, analyzes and interprets the data gathered in this study. The various results of using technology driven intervention in Grade 8 students who are at risk of dropping out (SARDO) in Science are presented on succeeding tables.

#### Performance of Grade 8 Students At-Risk of Dropping out at the Start of the Experiment

At the start of the experiment, ten (10) SARDOs were assigned to the control group and another ten (10) to the experimental group. Both groups were given pretest in Science. This was to determine their level of knowledge in Science at the start of the study.

Table 1. Pretest Scores of the Students At-Risk of Dropping Out

Pretest Scores	Frequency	Percentage	Description
17-20	0	0%	Very Good
13-16	0	0%	Good
9-12	0	0%	Fair
5-8	14	70%	Poor
1-4	6	30%	Very Poor
Over- all Mean Score	: 5.45	Poor	

Table 1 shows that all respondents Performed Poorly in the Science Pretest with seventy percent (70%) got between 5-8 and thirty percent (30%) got the scores of 1-4.

The overall mean score of the students at risk of dropping out is 5.45, and this indicates

that these students perform Poorly in Science. This finding supports the idea of Oriakhi (2013) that poverty is one of the causes of students' poor performance due to insecurities they have felt during their early childhood years. Moreover, parents' educational

attainment would also significantly affect students' overall academic achievement (Berhanu, 2011).

### ***Difference of Students At-Risk of Dropping out Performance of the Control and Experimental Group before the Experiment***

To determine if there is a significant difference in the performance of SARDOs in Science

before the experiment, t-test for independent samples was used on the pretest scores of the students. Table 2 shows the results.

As shown in Table 2, the control group got a pretest mean score of 5.40 out of 20. This is very close to the pretest mean of the experimental group which is 5.50.

*Table 2. Differences in the Pretest Scores of the Control Group and the Experimental Group*

Group	Mean Pretest Score	t- value	p- value	Remarks
1. Control Group	5.40	.136	.894	No Significant Difference
2. Experimental Group	5.50			

Using t-test, the t-value is .136 and the p-value is .894. Since  $p > .05$ , then there is no significant difference in the mean pretest scores of the control group and the experimental group. This result implies that at the beginning of the study, the two groups are equivalent in the level of knowledge in Science. Both performed Poor in Science at the beginning.

Hence, there is no bias in the grouping of students in the control group and the experimental group. These findings support the study of Aloset, et. al., (2015) that negative study habits and living far from school were the causes of having low learning performance.

This leads to the acceptance of the null hypothesis that there is no significant difference

in the pretest scores of students at risk of dropping out in the control and experimental group

### ***Performance in Science among Students At-Risk of Dropping out in the Control Group***

The control group also consisting of ten (10) Students at Risk of Dropping out was taught with the same topics in science for one month using the module. To determine if there was a significant improvement in the performance of SARDOs in Science which used worktext, t-test for dependent samples was used on the pretest and posttest scores of the students. Table 3 shows the result.

*Table 3. Difference in the Pretest and the Posttest of Students At-Risk of Dropping Out (SARDO) in the Control Group (Worktext-intervention)*

Control Group (Worktext-intervention)	Mean	t- value	p- value	Remarks
1. Pretest	5.40	3.12	.012	with a significant difference
2. Posttest	7.50			

The students in the control group got a pretest mean score of 5.40. After being taught remedial classes in Science using worktext-intervention, the control group got a relatively higher posttest mean score of 7.50.

Using t-test, the obtained t-value is 3.12 with a p-value of .012. Since  $p < .05$ , then the difference between the pretest and the posttest is significant.

This result indicates that with the use of worktext- intervention, the Students At Risk of Dropping Out in the control group had significant improvement of their knowledge in Science as shown through the higher posttest mean scores about their pretest scores.

Thus, the used of worktext in a remedial class for SARDOs is an effective method in helping students learn Science better. This result supports the findings of Matanluk (2013) that

the use of teaching worktext greatly improve students intellectual abilities as the use of learner- centered approach to motivate vigorous participation in the discovery of knowledge.

This leads to the rejection of the null hypothesis that there is no significant difference in the pretest and posttest of Students at Risk of Dropping Out in the control group.

### **Improvement in Performance in Science of the Experimental Group**

*Table 4. Difference in the Pretest and Posttest of Students At-Risk of Dropping Out in the Experimental Group (Technology- Driven Intervention)*

Experimental Group (Technology- Driven)	Mean	t-value	p-value	Remarks
1. Pretest	5.50			with a significant difference
2. Posttest	12.40	8.10	.000	

The experimental group obtained a pretest mean score of 5.50 at the start of the study. After undergoing remedial classes using technology- driven intervention such as TV, Power-Point, the internet and video clips, the Students At Risk of Dropping Out got a high posttest mean of 12.40.

Using t-test for dependent samples, the obtained t-value is 8.10 and p-value are .000. Since  $p < .05$ , then the difference between the pretest and posttest is significant. This result implies that there is a significant improvement in the learning of Science among Students At-risk of Dropping Out when they underwent remedial instruction using technology- driven intervention. There is a better understanding of the lessons in Science as compared to their knowledge before undergoing technology-driven intervention. This support the findings of Cruse (2011) that frequent use of multimedia tools in science learning greatly enhanced 70% among students achievement. Further, Abidin (2011) believed that there were more than a half of frequent multimedia users were then use new vocabulary thus it is effective to help learners in the recall and retention of the meanings learned. Smetana (2011) believed that using computer simulations truly stimulate students' reflection and promote mental alertness when used as enhancements.

The experimental group was taught on selected topics in Science such as Food Chain, Water Cycle and the Human Impact on Environment for one month using technology- driven intervention. To determine whether technology- driven intervention has been an effective method in teaching Science, t- test for dependent samples was used between the pretest and posttest scores of students at risk of dropping out. Table 4 shows the results.

It develops students' inquiry-based, authentic science explorations and proficiency. As what SARDO's statement on one of the organisms is given about food chain "*timos mani, cricket diay inenglish sa timos?*" he added, *permente ko maka dungog ug cricket kada gabii tig kaon diay ni sila ug sagbot or insekto meaning consumer diay ni eh*".

Moreover, audio and video materials are an excellent tool in presenting knowledge by showing real life scenarios and explaining concepts thus surely improve student learning experience, engage in discussion and inspire learning (Deakin, 2014). Figure 3 illustrates as what SARDO remarked on the topic regarding "Human Impact on the Environment" video, "*hala, mag lunop diay kung magsige mi ug panguling?*" In that sense, SARDO understood and realized the detrimental effect brought by illegal logging as the livelihood of their parents.

This leads to the rejection of the null hypothesis that there is no significant difference in the pretest and posttest scores of the Students At-Risk of Dropping Out in the experimental group.

### **Difference in the Effectiveness of Using Module and Technology Driven Intervention**

This study likewise determined which of the two methods- Work text-intervention or

Technology – Driven Intervention is more effective in improving students' performance in Science. To do this, the mean gain scores of the students (posttest-pretest) were obtained, and t-test for the independent sample was applied. Table 5 shows the result.

The control group which underwent remedial instruction using work text-intervention got a mean gain score of 2.10. This is relatively lower than the mean gain score of the experimental group which is 6.90.

*Table 5. Difference in the Mean Gain Scores of the Control Group and the Experimental Group*

Group	Mean Gain Score	t- value	p- value	Remarks
1. control group (worktext)	2.10			
2. experimental group (technology- driven)	6.90	4.40	.000	With significant difference

The t-value is 4.40 and the p- value is .000. Since  $p < .05$ , then there is a significant difference between the mean gain scores of the two groups. This result indicates that regarding improvement in learning in Science, students at risk of dropping out which underwent technology- driven intervention had greater improvement than the SARDOs which underwent remedial intervention using worktext. Hence, technology- driven instruction is more effective than using worktext alone in the conduct of remedial intervention among Students at Risk of Dropping Out as supported from the study of (Aloraini, 2012). Yusuf (2010) and Smetana (2011) concluded that that computer- assisted instruction can be as helpful and in many ways more efficient than the conventional method such as textbook-based, lecture-based or hands-on instructional practices in teaching science process skills, comprehension, and assisting theoretical alteration. But it doesn't mean that using worktext among students at risk of dropping out is an ineffective intervention learning tool subsequently. Watin (2011) believed that it has also an advantage effect to students' academic achievements by providing them a clear purpose to focus their learning efforts and directing on what to do to their instructional activities.

Through the aid of multimedia, apparently increases learner's familiarity on language structuring because they need to interact with the internet through reading and writing. Using multimedia provides students to gather information that stimulates interests and imaginations, improves skills and motivations thus

creating a successful teaching method (Joshi, 2012).

Technology-driven intervention represents an educational tool that includes the utilization of TV, projector, computer set, internet connection and Microsoft PowerPoint for efficient visual presentation, speakers for better audio inputs and good hearing effects and video clips downloaded from YouTube (Thangarajathi et al., 2012; Daus, 2013).

The benefit of using technology- intervention in teaching is supported by various studies. According to Cai, et al., (2012), computer-facilitated instruction software in the modern education process is being popularized, and teachers usually adopt multimedia educational software for teaching. Thus, it assists teachers to complete the teaching matters. Furthermore, it offers teachers another format for teaching goal-setting and self-determination (Mazzotti, 2011). Likewise, the application of multimedia Computer Aided Instruction (CAI) courseware used in the higher education helps develop competence in teaching in academies and universities (Nie, 2011).

Conrad (2011) believed that computer-aided multimedia learning used in Biology lesson offers opportunities to individualize students learning behavior that accords in their learning pace and need, subsequently, it may result in a high performance for the slow learner. Lucas (2013) defined slow learner student like those who fell below passing grade level and experienced repeated academic failures and reacted these failures through misbehavior and aggressiveness while drop-out stu-



dent does not possess the way how underachiever behaves but they do fell below passing grade (Clandinin,et. al. 2013).

Watin (2011) also added that conventional method was advantageous, but computer-based instruction tool is more efficient, useful as an alternative teaching method and helpful as a supplementary material; thus, indisputably enhance better improvement in students' academic performance as agreed by Ruedas (2011) and supported by Daus (2013).

Inevitably, the use of technology driven intervention to students at risk of dropping out stimulate active participation since they were obliged to participate with computer's instruction in a private learning environment. Moreover, technology learning experiences facilitate learning independence and self-paced since students were the one's to control and manipulate the keys to view animation of objects that were helpful to understand the explanation of a concept. Having control over the process makes the student determined.

Lastly, technology- driven intervention boosts SARDOS (students at risk of dropping out) motivation and improves attitudes since they frequently attended the science class intervention every 4:00- 5:00 in the afternoon thus it lessened their absences not only in researcher's class but as well as to other subject areas. As a result SARDOS who attended the science class intervention were successfully passed in other learning areas also.

In some other way, technical issues occurred in using technology as intervention specifically on online learning topics since Alegria National High School has limited access to internet service provider.

Another, there were SARDOS who cannot do simple task in computer-related terms. Thus, the concerned student should be given special attention.

On the other hand, almost of the SARDOS had difficulty in understanding English instruction therefore it should be translated to Filipino instruction. Lastly, some computer knowledgeable SARDOS wanted to finish the given task as early as possible because they have responsibility at home like getting the livestock from the pasture, and so it disturbed their learning.

## Summary, Findings, Conclusions and Recommendations

This chapter deals with the summary, findings, conclusions, and the corresponding recommendations of the study.

### Summary

This study was conducted to find out the effectiveness of technology-driven intervention on the learning performance of students at risk of dropping out in Science at Alegria National High School.

Specifically, this study sought answers to the following questions.

1. What are the pretest scores of the students at risk of dropping out in the control and the experimental group?
2. Is there a significant difference in the pretest scores of students at risk of dropping out in the control and experimental group?
3. Is there a significant difference in the pretest and posttest of students at risk of dropping out in the control group?
4. Is there a significant difference in the pretest and posttest of students at risk of dropping out in the experimental group?
5. Is there a significant difference in the mean gain scores of students at risk of dropping out in the control and experimental group?

The study was conducted at Alegria National High School, Alegria, Alabel, Sarangani Province. The experimental group and the control group was represented by Grade 8 selected Students at Risk of Dropping out (SARDO).

Both groups took the pretest on the first week of February, 2016. The same test was given to the groups as a posttest after one month of intervention. The scores of their tests were recorded, tabulated, analyzed, and interpreted.

T- test was used to determine the (1) pretest scores of students at risk of dropping out in the control and experimental group (2) pretest and posttest of students at risk of dropping out in the control group (3) pretest and posttest of students at risk of dropping out in the experimental group and (4) mean gain scores of students at risk of dropping out in the control and experimental group.

The null hypotheses were tested at 0.05 level of significance.

### Findings

The analysis of the gathered data resulted to the following findings:

1. The students at risk of drop out performed Poorly in Science before the conduct of the remedial class ( $\bar{X}$ = 5.45).
2. The control group and the experimental group do not differ on their level of performance in Science at the start of the experiment ( $t$ = .136,  $p$ = .894).
3. There is a significant difference in the pretest and posttest of the control group which was taught remedial classes using module ( $t$  = 3.12,  $p$  = .012).
4. The experimental group consisting of Students At Risk of Drop Out which underwent technology- driven intervention had a significant difference in their pretest and posttest ( $t$  = 8.10,  $p$  = .000).
5. The mean gain score of the experimental group which used technology- driven intervention was significantly higher than the mean gain score of the control group which used the module ( $t$  = 4.40,  $p$  = .000).

### Conclusions

1. The students at risk of dropping out have Poor performance in Science at the start of the experiment.
2. The students at risk of dropping out in the two groups have the same level of performance in Science at the start of the experiment.
3. Based on pretest and posttest scores, students at risk of dropping out had significant improvement in Science when taught using module.
4. Technology- driven intervention helped students at risk of dropping out improved their performance in Science.
5. Technology- driven intervention is more effective than using module in improving students at risk of dropping out performance in Science.

### Recommendations

1. Remedial instruction should be regularly conducted to help students at risk of dropping out learn difficult topics on their academic subjects.

2. Guidance and counseling services may be provided to students at risk of dropping out to find out what other factors might have caused their risk of dropping.
3. ICT materials must be purchased by school administrations for instructional purposes and for the conduct of remedial instruction.
4. The lecture method can still be used by teachers in the conduct of remedial instruction.

### Acknowledgement

The Researcher's Wishes to Express Her Earnest and Heartfelt Gratitude to Different People Who Assisted and Greatly Contributed Their Ideas in The Successful Completion Of The Study In Different Ways;

To Dr. Wilfred D. Bidad, Dean of Graduate School for His Support and Challenges;

To Prof. Maria Luisa Non- Cabrera, The Researcher's Adviser, For the Countless Perseverance, Guidance and Vivid Ideas That Led to The Realization of This Study;

To Dr. Maria Lourdes Dm. Galia, For Her Valuable Constructive Suggestions and Professional Assistance, Especially in The Statistical Analysis Which Greatly Improved The Manuscript;

To Dr. Lito S. Adanza, For His Fervent Advice and Perceptive Recommendations for The Refinement Of This Manuscript;

To Sir Isagani S. Dela Cruz, Ceso V, The Schools Division Superintendent- Sarangani Division for Allowing the Researcher to Conduct The Study.

To Madam Susana S. Sumagka, Maed, The Principal of Alegria National High School For Myriad Support And For The Consideration During The Most Demanding Instances.

To Nathaniel A. Galopo, Marilou S. Pedregosa and Eden D. Palalio for The Selfless Assistance and Promptly Responding To The Request Of The Researcher's Need During The Conduct Of The Study;

To The Parents of Students at Risk of Dropping Out for Their Whole-Hearted Support To Their Sons/Daughters And Cooperation In The Conduct Of The Study;

To The Students at Risk of Dropping Out of Grade 8 Classes for Their Attendance and Cooperation in Answering the Questionnaires Patiently.

To Mrs. Clotilde P. Aniñon, For Her Technical Assistance, As Well As to Mr. Jess Managa for His Accommodation.

To Their Beloved Family, Especially to Their Papang, Mamang, Husband, Wife, Brothers and Sister, In-Laws, Nieces and Nephews for The Prayers and Unconditional Love in This Endeavor;

Above All, to the Almighty Father Who Make All Things Possible and Who Gives Strength and Wisdom to Finish This Masterpiece. To God be The Glory!

## References

- Abidin, M. (2011). A comparative Study of Using Multimedia Annotation and Printed Textual Glossary in Learning Vocabulary. 1, 1.08
- Achievement and Problem Solving Skills of the Science and Technology Students. The Turkish Online Journal of Educational Technology, 10.
- Ahmad R. Nasr, A., Soltani K. (2011). Attitude towards Biology and Its Effects on Student's Achievement.
- Ali, M. (2013, January 1). Changes in Student Attitudes Regarding Science When Taught by Teachers Without Experiences With a Model Professional Development Program. School Science and Mathematics Association.
- Aliasgari, M., Riahinia, N. (2010) "Computer-assisted instruction and student attitudes towards learning mathematics", Education, Business and Society: Contemporary Middle Eastern (3) 6 – 14.
- Aloraini, Sara. (July 2012). The Impact of Using Multimedia on Students' Academic Achievement in the College of Education at Kin Saudi University. Journal of KSU, 24 (2), 75- 82.
- Aqda, M., Fatemi, H., Rahimi, M. (2011). The comparative effect of computer-aided instruction and traditional teaching on student's creativity in math classes. Procedia Computer Science 2011 3 266-270
- Bowers, Alex J. (2010). Publishing models and article dates explained. Published online: 08 Jul 2010, 191-207.
- Cai, H., Wang, Yanhong, L. (2012). Research and Development Based on Interactive Computer Aided Instruction Software. IERI Procedia, 2.
- Conradty, C, Bogner, F X. (2011). Computer-aided learning: Unguided versus guided instruction. Advanced Science Letters.(4) 3310-331.
- Cornelia, R., March. (2012). Drop-rate of Secondary Students as Influenced by Socio-Economic Factors and Students Factors. Graduate School, Mindanao State University.
- Crisol, A. (2012, November 6). Transcript of Dropout reduction program.
- Cruse, E. (2011). Using Educational Video in the Classroom: Theory, Research and Practice. Library Video Company.
- Daus, L.J. (2013). The Effect of Computer Assisted Instruction (CAI) on the Academic Achievement in Physics of Secondary Students in NDMU-IBED. Graduate School of Mindanao State University.
- Gunes, H. (2010). Investigation of Effects of Modelling and Computer Assisted Instruction on Academic Achievement. Mayis University, Turkey Educational Research.
- Joshi, A. (2012). Multimedia: A Technique in Teaching Process in the Classrooms. Curr World Environ, 1: 33- 36.
- Liu, P., Chenb, C. (2010). Change, Effects of a computer-assisted concept mapping learning strategy on EFL college students' English reading comprehension. Oxford, UK, Journal Computer Education, 54 2, 436-445
- Matanluk, O., Mohammad, B. (2013). The Effectiveness of Using Teaching Module Based on Radical Constructivism toward Students Learning Process. Procedia- Social and Behavioral Sciences. 90, 607-615.
- Mazzotti, Valerie L., Charles L. Wood, David W. Test, (2011, December 29). Effects of Computer-Assisted Instruction on Students' Knowledge of the Self-Determined Learning Model of Instruction and Disruptive Behavior. University of North Carolina at Charlotte.
- Newell, Alana D.\*, Zientek L. (2015, May 5). Students' Attitudes Toward Science as Predictors of Gains on Student Content Knowledge: Benefits of an After-School Program. 115, 1, 216-255, DOI: 10.1111/ssm.12125
- Nico, Wouter R. van Joolingenb, Jan T. van der Veen (2012). The learning effects of computer simulations in science education. 136–153.
- Nie, Sen, Liu, Yan. (2011). Proceedings - 2011 4th International Conference on Information Management, Innovation Management and Industrial Engineering, 1 453-455
- Omrod, J.E. (2010, July 20). Characteristics of Students at Risk and Why Students Drop Out. Pearson Allyn Bacon Prentice Hall.
- Orbeta, Aniceto Jr. C. (2010). Global study on child poverty and disparities: Philippines. Filipino Child Policy Brief UNICEF-PIDS project Senior Research Fellow at the Institute.
- Özdener, Nesrin, Eşfer, Sezin. (2009). A comparison of computer-aided ELVES method and video-aided instruction in text. teaching in terms of student success. 1, 2327-233.
- Palanca, Troy James. (2015, August 27). A look at dropout rates in the Philippines.
- Pappas, Christopher. (2014- 08-07). Computer-Based Instruction Theory.
- Pedreira, K., Pear, J. (2015). Motivation and Attitude in a Computer-Aided Personalized System of Instruction Course on Discrete-Trials Teaching. Journal on Developmental Disabilities (21)1, 46-51.
- Şeker, Soner. (2013). Computer - Aided Learning in Engineering Education Social and Behavioral Science. (83) 739-742

- Serin, Oguz. (2011). The Effects of the Computer-Based Instruction on the Achievement and Problem Solving Skills of the Science and Technology Students. *Turkish Online Journal of Educational Technology - TOJET*, (10)1, 183-201.
- Serin, Oğuz. (2011). The Effects of the Computer-based Instruction on the
- Shah Z., Mahmood, N., (2013, September 28). Attitude Towards Science Learning: An Exploration of Pakistani Students. *Journal of Turkish Science Education*, 10, 2, 35-47.
- Slavin, Robert E. (2011). Small-Group, Computer Assisted Tutoring to Improve Reading Outcomes for Struggling First and Second Graders. *The Elementary School Journal* (111)4, 625-640. Published by: University of Chicago Press.
- Smetana, L., Bellb, R. (2011, August 09). Computer Simulations to Support Science Instruction and Learning: A critical review of the literature. 1337-1370.
- Song, C., Beninb, M., Glickb, J., (2012, February 23). Dropping Out of High School: The Effects of Family Structure and Family Transitions, 18-33.
- Soo, Y., Parker, L. (2015, October 01). Changes in Elementary Student Perceptions of Science, Scientists, and Science Careers After Participating in a Curricular Module on Health and Veterinary Science. DOI: School of Science and Mathematics 10.1111/ssm.12129.
- Tan, Da Peng, Ji, Shi Ming, Jin, Ming Sheng. Intelligent computer-aided instruction modeling and a method to optimize study strategies for parallel robot instruction. 56 3 268 273
- Thangarajathi, S., Enk, T. (2012, May). Impact of Multimedia in Teaching and Learning. *Academic Journal*. 1 11.
- Tzu-Hua H., Liu Y. (2012, January). Learning Achievement in Solving Word-Based Mathematical Questions through a Computer-Assisted Learning System. *Journal of Educational Technology & Society*. 15 1 Technology Supported Cognition and Exploratory Learning, 248-259.
- Villar, M. (2008 June 3). No Filipino Child Left Behind Act of 2008. 14th Congress Senate Bill No. 2366.
- Yi, H., Linxiu, Z., Renfu Luoa, Y. Di Moc, (2012, July). Dropping out: Why are students leaving junior high in China's poor rural areas? 32, 4, 555-563.
- Yusuf, M., Olalere, A., Adedeji, O. (2010, January). Effects of Computer Assisted Instruction (CAI) on Secondary School Students' Performance in Biology). *Turkish Online Journal of Educational Technology - TOJET*, v9 n1 62-69.
- Zemlainsky, P., Wilcox, D. (2010). Design and Implementation of Educational Games: Theoretical and Practical Perspectives. *Information Science Reference*. United States of America.