

Leveraging Technology in Asynchronous and Synchronous Teaching

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Abstract

This research aimed to identify the degree of technology integration of teachers at Ignacio B. Villamor Senior High School. The research would determine the least mastered skills of teachers in basic computer trouble shooting and Google Applications, which are frequently used in online synchronous and asynchronous study, specifically Google Classroom, Google Form, Google Meet, and Google Drive. SMAR Model (Substitution, Modification, Augmentation, and Redefinition) by Dr. Ruben R. Puentedura (2021) was the basis of the theoretical framework of the study. Descriptive method was utilized in the study wherein the researcher gathered responses through Google Forms. There are 18 teachers who were included in the study. The treatment that was utilized in the study are percentage, rank, and mean. An action plan was created based on the needs assessment of the study.

Keywords: Asynchronous; Synchronous; Teaching; Technology Integration; Online Class

1. Introduction

There is a paradigm shift in teaching because of the pandemic. In this time, teachers and learners are not allowed to meet physically in the classroom. In this time of the pandemic, there is a need to leverage the skills of teachers in technology integration.

Cambridge Dictionary defined leveraging as using something that you already have to achieve something or be better. Poth (2020) states that technology provides learning experience regardless of time and place. Tiburcio (2019) stated that teachers cannot get rid of the fact that technology is becoming a part of instruction wherein the learners are the generation Z.

Because of this, Department of Education issued a memorandum that would determine the modes of teaching in the time of pandemic. Last March 15, 2020, DepEd Memorandum No.043 s.2020 Department of Education observed the stringent measures by all DepEd offices, units, and schools located in the National Capital Region (NCR) was implemented to mitigate the scale of transmission of COVID-19.

Because of the spread of COVID-19, people residing especially in the National Capital Region (NCR) followed the minimum health requirement. Because of the national health emergency, schools must not implement face-to-face instruction. However, learning continues through different forms of learning modality.

Abu (2020) differentiated the three learning modalities in the new normal: distance learning, online distance learning, and television/radio based instruction. In the National Capital Region, face-to-face learning is not an option. Majority of the students chose online distance learning instruction. Distance learning is defined as a learning modality where learning takes place between the teacher and the learner who are remote from each other during the actual period of instruction.

Because of the given scenario, teachers are now familiarized with the term synchronous and asynchronous class. Scheiderer (2021) defined synchronous class as a firm, weekly time commitment that cannot be rescheduled. Learning is synchronous learning is a form of distance learning. Asynchronous learning allows students to learn at their own schedule within a given timeframe. They assess lectures, readings, homework, and other learning materials at any time during one week or two week period.

Lagua (2020) explained that teachers tend to translate or migrate face-to-face learning techniques to the online environment; however, this requires a new transformation mindset. This posts a quite challenge to the instructors. The challenge to instructors is to build rich activities.

DepEd Order No. 031 s.2020 highlighted the role of technology in education; technology plays a vital role in the development, communication, and, implementation, and grading of assessment tasks.

DepEd Order No.036 s.2020 defined Basic Education Learning Continuity Plan (BE-LCP) which is a package of education interventions that will respond to the basic education challenges brought by the pandemic. This memo also listed the definition of home-based learning as a delivery of basic education, whether formal or informal, under the lead supervision of a teacher but undertaken in the homes of learners through various learning delivery modalities except homeschooling.

Homeschooling is defined as a provision for learners with access to formal education while staying in out-of-school environment, under the lead supervision of authorized parents, guardians, tutors, who will act as learning facilitator. The learning facilitators are given flexibility in learning delivery, scheduling, assessment, and curation of learning resources.

In January 2021, DepEd Order No. 001 s. 2021 released the guidelines in the evaluation of the self-learning modules for Quarter 3 and 4 for School Year 2020-2021. Self-learning module was defined as a primary learning resource for distance learning. It is either printed or digital. It focuses on the development of one or several related Most Essential Learning Competency (MELC) in a learning area/subject area.

In the study of Mishra (2020), she enumerated the mode of learning that was used by the teachers in India. These include Mizoram University-Learning Management System, Google Classroom, Zoom/Cisco WebEx/Google Meet/Skype, Webinar, Youtube Videos, Youtube/Facebook Streaming, WhatsApp/Telegram, Telephone Conversation, Email, Swayam Prabha Educational DTH channels/Zonet cable TV.

At Ignacio B. Villamor Senior High School, 85% of the students chose online distance learning as a mode of learning for S.Y. 2020-2021.

1.1 Theory

Ruben R. Puentedura (2021) explained his theory named SMAR Model. In his model, he categorized four different degrees of classroom integration. SMAR is an acronym for substitution, augmentation, modification, and redefinition. This model was created; so, people, most specially teachers, can assess how technology is integrated in instruction in different levels. This would allow more meaning use of technology in teaching.

In the substitution stage, technology is directly substituted for a more traditional one. In augmentation, technology is again substituted but with a particular enhancement to the students' experience. Substitution and augmentation are forms of enhancement.

For modification, the technology must alter the task. For redefinition, it refers to the transformation of students' experience. Modification and redefinition are forms of transformation.

The four steps in building SAMR ladder are selecting a unit of instruction, redesigning the intro to the unit (basic knowledge, materials) at the S level, redesigning the development of the unit at the A,M, levels, and redesign/ creating a student culminating experience for the unit at the R level.

The research was conducted to identify the teachers' degree of technology integration at Ignacio B. Villamor Senior High School. The researcher used the SAMR model to determine the assessment of the teachers in their technology integration before the pandemic. The results would be used to plan an action research that would be useful in leveraging the degree of technology integration of teachers.

In addition, the research was conducted to determine the least mastered skills of teachers in basic computer troubleshooting and Google Applications specifically in Google Classroom, Google Meet, Google Form, and Google Drive. After the needs assessment, the researcher proposed an action plan.

Li (2020) mentioned that some believed that unplanned and rapid move to online teaching with no training and insufficient bandwidth, and little preparation will result to poor experience that is uncondusive to sustained growth. There are challenges that needs to be overcome like internet access and/or technology struggle to participate in the digital learning. To get the full benefit of online learning, a concerted effort to go beyond replicating a physical class instead use a range of collaboration tools and engagement methods that promote inclusion, personalization, and intelligence is necessary.

The results in the study were essential in conducting online trainings for teachers. In the time of pandemic, knowledge of basic computer troubleshooting and Google Applications is essential for teachers.

There are many learning resource management systems which can be used in online class. However, the researcher chose Google applications; since, G-Suite was freely given by Department of Education to teachers and students. Google Classroom, Google Drive, Google Meet, and Google Form are the most essential learning application management system that the teachers will utilize in their everyday online teaching.

Saxena (2020) wrote that educators needed to upskill themselves almost overnight to adjust to the new modes of teaching, and ensuring that learning remains accessible to students even in the current of the circumstances.

1.2 Statement of the Problem

The researcher aimed to identify the degree of teachers' technology integration at Ignacio B. Villamor Senior High School specifically this would like to answer the following questions:

1. What is the degree of technology integration of teachers at Ignacio B. Villamor Senior High School in:
 - a. Substitution;
 - b. Augmentation;
 - c. Modification: and
 - d. Redefinition?
2. What are the least mastered skills of Ignacio B. Villamor senior high school teachers in basic computer troubleshooting?

3. What are the least mastered skills of Ignacio B. Villamor Senior High School teachers in Google Applications specifically in:
 - a. Google Classroom;
 - b. Google Meet;
 - c. Google Form; and
 - d. Google Drive?
4. What was the proposed action plan based on the results of the needs assessment?

2. Methodology

2.1 Research Design

The researcher utilized the descriptive research in the study. Shuttleworth (2021) defined descriptive research as a scientific method which involves observing and describing behaviour of a subject without influencing it in anyway.

2.2 Participants of the Study

The respondents of the study are the 18 teachers of Ignacio B. Villamor Senior High School. They will be teaching through asynchronous and synchronous learning. The respondents of the study are the teachers of Ignacio B. Villamor. The study was conducted in S.Y. 2020-2021. The sampling procedure utilized in the study is convenience sampling. Edgar & Manz (2017) defined convenience sampling as a method of collecting samples by taking samples that are conveniently located around a location or internet service.

2.3. Instrumentation

In order to obtain data from the study, a researcher-made questionnaire was utilized as the main instrument of the study.

Researches were made to supplement the gathered data from the students and teachers. The primary data used in gathering data was in the form of an online questionnaire.

The researcher used Google Form to gather data. The first type of questionnaire refers to the degree of teachers' technology integration in their classes.

The second type of questionnaire identified the least mastered skills of teachers in basic computer troubleshooting. The last type of researcher-made questionnaire is the use of Google Applications (Google Classroom, Google Meet, Google Drive, and Google Form).

2.4. Data Gathering Procedure

2.4.1. Preparation. The researcher-made questionnaire is a four-point likert scale. The second questionnaire is a yes or no question that determined whether the teachers are knowledgeable on certain basic computer troubleshooting. The second is a Yes or No questionnaire that identified the knowledge of teachers in using Google Applications.

2.4.2. Validation. The researcher-made questionnaire was validated by experts. Suggestions were made by the experts. Based on the suggestions made by the experts, it was revised by the researcher.

2.4.3. Administration and Retrieval. The purpose of the research was explained to the respondents in the study. Afterwards, the researcher distributed and retrieved the questionnaires through Google Forms.

2.5. Data Analysis

The data gathered from the teachers were treated with the use of percentage, rank, and mean.

The number of teachers who know how to use the specific functions in the Google Applications (Google Classroom, Google Meet, Google Form, and Google Drive) was identified through the use of percentage.

In addition, the teachers who know how to do certain basic computer troubleshooting were also identified using percentage.

Table 1 presents the numeral and descriptive description of the mean scores in the degree of technology integration of teachers.

Table 1: Numerical and Descriptive Description of Degree of Technology Integration

Numerical Description	Descriptive Description
3.56-4.00	Outstanding
3.01-3.50	Excellent
2.51-3.00	Very Good
2.01-2.50	Good
1.51-2.00	Below Average
1.00-1.50	Failed

The degree of technology integration in Substitution, Augmentation, Modification, and Redefinition was ranked by the researcher according to the mean scores. To determine the level of teachers in technology integration, the researcher used the formula for ungrouped mean.

3. Results and Discussion

3.1 Degree of Technology Integration of Teachers

Table 2: Degree of Technology Integration of Teachers at Ignacio B. Villamor Senior High School

SAMR MODEL	Mean	Description	Rank
Substitution	2.94	Very Good	4
Augmentation	3.14	Excellent	1
Modification	3.02	Excellent	3
Redefinition	3.11	Excellent	2

Table 2 presents the degree of technology integration in SMAR Model. Augmentation was the most frequent technology integration utilized. The technology integration that teachers use least is substitution.

The most mastered skill in substitution is allowing students to present in class using related audios, videos, and/or hyperlinks with a mean of 3.50 or a description of excellent. The least mastered skill in substitution is using Google forms in creating tests with a mean of 2.33 or with a description of good.

The most mastered skill of teachers in augmentation is allowing students to use online dictionary or other applications to aid them in reading and understanding materials. The least mastered skill in augmentation is the use of Google sheet with automatic marking script with a mean of 2.72 or description of very good.

The most mastered skill in modification is allowing students to present using video presentations. The least mastered skill in modification is allowing students to annotate notes using online applications and giving supplementary lessons after assessment in Google sheets.

The most mastered skill in redefinition is allowing students to create interviews based on the discussed concepts. The least mastered in redefinition is allowing students to create collaborative maps using online tools.

3.2. Teachers' Skills in Basic Computer Troubleshooting

Basic computer troubleshooting is an important problem solving that is essential when teachers are conducting online teaching sessions. It is also essential when they are assigning tasks in asynchronous classes. It is significant for teachers to diagnose and troubleshoot basic computer problems; since, time especially in synchronous classes is already scheduled.

When a teacher has trouble in diagnosing and troubleshooting basic computer problems, it also means a lesser learning time for students. The most mastered skill in basic computer troubleshooting among teachers is knowing how to do when a computer does not start. It has a yes response of 88.9%. The least mastered skill in basic computer troubleshooting is knowing what to do when there is no image in the screen when I start my computer with a yes response of 50.0%. Table 3 showcases the skills of teachers in Basic Computer Troubleshooting.

Table 3: Percentages of Teachers' Skills in Basic Computer Troubleshooting

Teachers' Skills in Basic Computer Troubleshooting	Yes (%)	No (%)
1. I know what to do if I turn on the computer and it does not start.	88.9	11.1
2. I know what to do when there is no image in the screen when I start the computer.	50.0	50.0
3. I know what to do when the computer doesn't like to print.	77.8	22.2
4. I know what to do when a file is lost in the hard drive.	55.6	44.4
5. I know what to do when there is there is an error message that appears in the document.	55.6	44.4
6. I know what to do when the hard drive or USB flash drive could not be recognized by the computer.	72.2	27.8
7. I know what to do when I cannot connect in the internet.	83.3	16.7
8. I know what to do if my computer camera is not working.	61.1	38.9
9. I know what to do if my students cannot hear my audio.	72.2	27.8
10. I know what to do if my microphone is not working.	83.3	16.7

It can be observed that there are six descriptions which got less than 80%. These are what to do when there is no image in the screen when starting a computer, what to do when the computer doesn't like to print, what to do when a file is lost in the hard drive, what to do when there is an error message that appears in the document, what to do when the hard drive or flash drive could not be recognized by the computer, what to do if the computer camera is not working, and what to do when students cannot hear audio.

3.3. Teachers' Skills in Google Classroom

Beal (2017) defined Google Classroom as a free-internet based collaboration tool developed by Google as part of G Suite for Education for creating, distributing, and grading assignments.

Table 4 is a representation of Google Classroom skills of teachers. It presents the percentage of teachers who answered yes and no in every specific question

Table 4: Percentages of Teachers' Skills Google Classroom Functions

Teachers' Skills Google Classroom Functions	YES (%)	NO (%)
1. I can invite students to join a class.	88.9	11.1
2. I can manage multiple classes.	66.7	33.3
3. I can invite co-teachers in a class.	83.3	16.7
4. I can modify an assignment.	83.3	16.7
5. I can create an announcement.	83.3	16.7
6. I can track posts, questions, and responses in the class stream.	72.2	27.8
7. I can create a class resource page.	77.8	22.2
8. I can grade and return an assignment.	83.3	16.7
9. I can assign points in a given quiz.	83.3	16.7
10. I can control who can share messages and comments in class stream by changing the permission settings.	77.8	22.2

The most mastered skill is inviting students to join the class with a percentage of 88.9% of teachers who can use this function. The least mastered skill is managing multiple class with a 66.7% of teachers who can use this function.

3.4. Teachers' Skills in Google Meet Functions

John (2020) explained that Google Meet is also known as Google Hangouts Meet. It is built to let dozens of people join the same virtual meeting, and speak or share video with each other from anywhere with internet access.

It is a way for colleagues who don't work in the same place to exchange ideas and collaborate.

Table 5: Percentages of Teachers' Skills in Google Meet Functions

Teachers' Skills in Google Meet Functions	Yes (%)	No (%)
1. I can start a video meeting.	88.9	11.1
2. I can join a video meeting.	94.4	5.6
3. I can add people in a meeting.	83.3	16.17
4. I can use auto caption in a meeting.	66.7	33.3
5. I can use screen lay-outs in a meeting.	61.1	38.9
6. I can mute and unmute participants in a meeting.	77.8	22.2
7. I know how to share my screen in a Google Meeting.	88.9	11.1
8. I can view meeting details and attachments.	72.2	27.8
9. I can send messages to video participants.	88.9	11.1
10. I can video record a video meeting.	83.3	16.7
11. I can plan and confirm attendance.	66.7	33.3

Table 5 presents the skills of teachers in the use of Google Meet. Joining a video meeting is the most mastered skill with a yes percentage of 94.4%. Using screen lay-outs in a meeting is the least mastered skill with a yes percentage of 61.1%.

3.5. Teachers' Skills in Google Form

Demarest (2021) defined Google Form as free online software for creating surveys and questionnaires.

A Google Form can be personalized through question types, header image, and color theme. Teachers' Skills in Google Form is reflected in Table 6.

Table 6: Percentages of Teachers' Skills in Google Form Functions

Teachers' Skills of Teachers in Google Form	Yes (%)	No (%)
1. I can create a new form	38.9	61.1
2. I can add a title to the form.	61.1	38.9
3. I can rename the title of the form,	61.1	38.9
4. I know how to navigate the form settings options.	61.1	38.9
5. I can add form descriptions.	61.1	38.9
6. I can add a question using various question types.	61.1	38.9
7. I can insert 'help text' with one of the options.	50.0	50
8. I can insert an image.	61.1	38.9
9. I can insert a video.	61.1	38.9
10. I can insert text response with data validation.	55.6	44.4
11, I can duplicate a question.	66.7	33.3
12. I can shuffle the questions.	61.1	38.9
13. I can add a section header.	66.7	33.3
14. I can add a page break.	72.2	27.8
15. I can change the theme of the form.	61.1	38.9
16. I can add a custom confirmation message.	55.6	44.4
17. I can view the live forms.	55.6	44.4
18. I can view the response sheet.	55.6	44.4
19. I can view the different response destination options	55.6	44.4
20. I can view the summary of responses.	61,1	38.9
21. I can send shortened URL versions of the survey with optional message.	55.6	44.4
22. I can share form with edit rights with specific collaborators.	55.6	44.4
23. I can share form wherein only people in the organization can access it.	55.6	44.4
24. I can require an answer to a question.	61.1	38.9

Table 6 refers to the teachers' skills in Google Forms Functions. The most mastered skill is adding a page break with a yes response of 72.2%. The least mastered skill in Google form skills for teachers is creating new forms.

To sum-up the results in the use of Google forms, it can be observed that all of the descriptions got a lower than 80% of yes responses.

3.6. Teachers' Skills in Google Drive

Mixon & Wigmore (2018) define Google Drive as a free-cloud based storage service that enables users to store and access files online.

Table 7 highlights the skills of teachers in Google Drive.

Table 7: Percentages of Teachers' Skills in Google Drive Functions

Teachers' Skills in Google Drive Functions	Yes (%)	No (%)
1. I can use the starred feature to easily access important files	61.1	38.9
2. I can share and restrict files to other users.	66.7	33.3
3. I can change the view of the files (e.g. I can make the files visual or linear)	61.1	38.9
4. I can color code the folders.	66.7	33.3
5. I can convert Microsoft Files to Google Drive.	50.0	50.0
6. I can find recent files in Google Drive.	66.7	33.3
7. I can start a new Google Tile.	50.0	50.0
8. I can rename a file.	77.8	22.2
9. View details and activity of the files	66.7	33.3
10. I can relocate a file	66.7	33.3
11. I can navigate folders hierarchy	61.1	38.9
12. I can make a copy of the file.	66.7	33.3

The most mastered skill of teachers in Google Drive is renaming a file with a yes percentage of 77.8%. The least mastered skill of teachers in Google Drive functions are converting Microsoft Files to Google Drive and creating a new Google Tile. These two functions got a yes percentage of 50%.

It can also be observed that all of the functions did not reach the yes percentage of 80%.

3.7. Proposed Action Plan

The following table explains the action plan of the study based on the needs assessment gathered from the teachers. The plan is reflected in Table 8.

Table 8: A Proposed Action Plan in Leveraging Technology to Empower Teachers and Learners in the 21st Century

Region, Division, District	NCR, SDO-Manila, District V
Name of School	Ignacio B. Villamor Senior High School
Key Changes in my school as a result of this intervention plan	The plan aims to improve technology integration in the school. The plan aims to improve the skills of the senior high school teachers in basic computer troubleshooting and Google Applications (Google Classroom, Google Forms, Google Meet, and Google Drive)
Target Competency Improvement	Integration of technology in the teaching and learning process, action research
Describe current situation (problem or opportunity) in your school that you need to address through your project.	<p>COVID-19 pandemic caused various challenges in the educational system. The Bayanihan to Heal as One Act or RA 11469 is a law that granted the president of the Philippines to combat the pandemic. DepEd Memo No. 7 Series of 2020 stated that opening of classes would be move on August 24, 2020 due to the restrictions and health protocols needed to be followed especially in schools. Later on the president announced through a memorandum that opening of classes in public schools will be moved in October 5, 2020. Aside from this, there will be no face-face class unless there is already a vaccine.</p> <p>The no face-face class posts challenges especially to the public school system since teachers and learners have limited technology (cellphone, laptops, and internet connection). In response to this, the City of Manila headed by Mayor Isko Moreno, announced that he will give tablets for every household. Sim cards will also be provided to the learners. In spite of these, there are still challenges in the conduct of the no face-face class. Therefore, the school needs to plan workshops to teachers and learners to capacitate them in technology integration.</p>
Title of Application Intervention Plan of Action	<p>Google and Apply:</p> <p>Leveraging Technology to Empower Teachers and Learners in the 21st Century</p>

Project Objective/s:	After the six-month implementation, the stakeholders of the project should be able to:
SMART –Specific, Measurable, Attainable, Result-oriented and with timeframe	<ol style="list-style-type: none"> 1. Identify the level of technology integration of teachers; 2. Identify the least mastered skills of teachers and learners in the online applications specifically in basic computer troubleshooting and Google Applications (Google Classroom, Google Drive, Google Meet, and Google Form) 3. Create specific, coordinated and innovative intervention strategies that address the needs of the teachers and learners 4. Collaborate with internal partners in order to sustain the implemented intervention strategies; and 5. Evaluate the sustainability of these intervention strategies through research and development tools
Start Date:	July 2020
Length of Project	The project is intended to be pilot-programmed for S.Y. 2020-2021 for 1 st semester After this, the project will be evaluated. If it is effective, then, the project would be continuously implemented.
The project should be completed within 6 months.	
Expected Outputs	<ol style="list-style-type: none"> 1. Level of Technology Integration of Teachers in S.Y. 2021-2022 2. Least Mastered Skills Survey of Teachers in the Google Application (Google Classroom, Google Drive, Google Forms, Google Drive). 3. Learning Action Cell Sessions that Coaches Teachers in Basic Computer Trouble Shooting and Google Applications 4. Uploaded tutorial of Google Applications in the Facebook page of Ignacio B. Villamor Senior High School faculty
Beneficiary/ies	Senior High School Teachers
Identify Success Indicators or measures of success	<p>This project will be a success when the following indicators have been achieved and verified through unbiased means (maximum of 3):</p> <ol style="list-style-type: none"> 1. A Needs Assessment Survey is conducted that leads to the identification of the least mastered skills of teachers in basic computer troubleshooting and Google Applications 2. Creation of Google Classroom for every subject. 3. Use of Technology in No Face-face learning specifically self-made video tutorials, quiz through Google Forms, and storage of files through Google Drive 4. Action Research Output

Action Steps

Identify significant Milestone targets that could be achieved by the end of 30 days and every 30 days thereafter. Milestones are (a) significant changes achieved; and/or (b) major steps taken towards achieving the desired improvement in your school.

Target Milestone	Actions	Responsible Person	Resources
Milestone 1: Pre-Implementation Phase	Step 1: Planning Meeting	Principal, Master Teachers	Google Meet/Zoom
	Step 2: Needs Assessment	Teachers	Google Meet/Zoom Google Form
	a. Crafting and Revision of the Needs Assessment Tool		
	b. Identification of Level of Technology Integration of Teachers		
	c. Identification of the Least Mastered Skills of Teachers in Basic Computer Troubleshooting and Least Mastered Skills in the Google Applications		
Milestone 2: Implementation Phase	Step 1: LAC Session of Teachers	Teachers, Master Teachers, Resource Speakers, Demonstration Teachers, Principal	Google Meet Resource Speakers Demonstration Teachers
	a. Basic Trouble Shooting		
	b. Google Classroom		
	c Demonstration on the Use of Google Classroom		
	d. Google Drive		
	e. Google Meeting		
	f. Demonstration on the Use of Google Meeting		

	Step 2: Presentation of Outputs a. Google Form b. Presentation of Google Classroom Per Section	Teachers, Master Teachers, Resource Speakers, Demonstration Teachers, Principal	Google Meet Sample Videos
Milestone 3: Post-Implementation Phase	Step 1: Monitoring and Evaluation a. Reflections of a 21 st Century Teacher b. Takeaways in the Use of Google Applications	Principal Master Teachers	Google Meet
	Step 2: Research and Development a. Coordination with the Action Research and Development Team b. Writing of the Action Research c. Presentation of the Action Research d. Plan for Further Studies	Principal, Master Teachers	Google Meet Book Binding Publishing Fee

4. Conclusion

These are conclusions drawn from the research questions of the study.

1. In terms of technology integration of teachers, it can be observed that majority of the descriptions are marked with excellent and very good. However, items with a descriptive rating of good and very good must still be improved; since, these skills are all basic in technology integration.
2. Teachers must be taught on how to equally give time in utilizing technology under substitution, augmentation, modification, and redefinition. It can also be observed that redefinition was ranked second. It may still be improved; since, it is the culminating experience of learning.
3. The least mastered skills in basic computer troubleshooting are knowing what to do when there is no image in the screen when starting the computer, knowing what to do when the computer doesn't like to print, knowing what to do when a file is lost in the hard drive, knowing what to do when there is an error message that appears in the document, knowing what to do when the hard drive or USB flash drive could not be recognized by the computer., knowing what to do if my computer camera is not working, and knowing what to do if my students cannot hear teachers' audio.

4. Among all the Google Applications mentioned in the study, the least mastered Google Applications are Google Forms and Google Drive.

5. Recommendations

Based on the results of the study, these are the recommendations of the researcher.

1. Teachers may still increase their activities in technology integration especially in the degree of substitution;
2. Teachers may still further their skills in Google Classroom, Google Meet, and Google Forms, and basic computer troubleshooting;
3. The institution may utilize the proposed action plan about the study;
4. Reflections about the study may be shared by the researcher to the stakeholders of the school; and
4. Other researchers may use this study as the basis of their study.

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