

Technology Integration in the Classroom of Sta. Lucia Junior High School

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Abstract—The main purpose of this study is to assess the status of the instructional technology onsite and the level of schools' effectiveness of Sta. Lucia High School in the City of Pasig during the School Year 2018 – 2019. Descriptive-quantitative research method was used. 93.33% of the junior high school teachers in Sta. Lucia High School served as respondents (i.e. 140 out of 150). A modified researcher-made questionnaire was employed to gather information. Data were statistically treated with the use of frequency distribution, percentage, weighted mean, and multiple linear regression. Based on the findings, the study concluded that: a) The instructional technology onsite were utilized, accessible and were supported by the school; b) The school's level of effectiveness was measured in terms of developing student performance and very satisfactory teacher performance; c) Significant relationship existed between the status of the instructional technology onsite, as well as the student and teacher performance; c) Solutions were recommended to address the barriers in technology integration in teaching such as: hire an expert for technical support and apply for an internet connection per classroom; and d) A framework of technology integration in teaching was developed based from the results of the study.

Keywords—Technology integration, academic performance and instructional technology

I. INTRODUCTION

Teaching is a complicated practice that requires an interweaving of many kinds of specialized knowledge. Technology has become part of the educational process but integrating technology in the classroom takes more than just having computers. Integrating technology is what comes next after making technology available and accessible. In order to incorporate technology-based activities and projects into their curriculum, those teachers must find first the time to learn to use the tools and understand the terminology necessary for participation in those projects or activities.

For many teachers, a lack of personal experience with technology presents an additional challenge. In fact, it takes years from the time new technologies are first introduced to the point when changes can be observed in students. Yet, the challenges to overcome integrating technology into educational practices has proven to be slow and complex process. To date, the most prevalent barriers to successful integration include organizational support, teacher attitudes and expectations, and technology itself.

The Department of Education (DepEd) reported that the majority of teachers used technology to develop lesson plans aligned with the curriculum, organize as well as monitor student data, create presentations, and communicate with students, parents, and colleagues. Although this is

progressive, educators need to advance their technological skills and usage to align with the increasing demand of 21st century technology advancements (Kusano, K., Frederiksen, S., L., Kobayashi, M. Mukoyama, Y., Yamagishi, T., Ishizuka, H. 2013). Integrating technology in the Philippine education has taken a lot of turns.

According to Mendoza (2015), Integration is when classroom teachers use technology to introduce, reinforce, extend, enrich, assess, and remediate student mastery of curricular targets. Integration is an instructional choice that generally includes collaboration and deliberate planning – and always requires a classroom teacher's participation.

All teacher training institutions (TEIs) have incorporated computer courses in their curriculum; however, there is still a need to conduct more professional development activities on integrating technology in education, specifically for classroom instruction. The key to successful student learning is the teacher, the professional who will utilize technology in the classroom. Thus, professional development for technology education is the answer to improve the teachers' literacy in integrating technology that is important for the improvement on students' learning.

The emphasis of education in technology right now is to ensure that the use of technology will promote higher achievements and create new opportunities for learning. In order to utilize technology as instructional materials, the teachers need to enhance their capability to do the integration and the competence to utilize technology. The DepEd is responding to this need by providing training's, seminars, and workshops as part of the policies. Existing information and communication technology (ICT) integration in education is still a great undertaking. The reality is that there is still a need for improvements like student-computer ratios or teacher-computer ratios, technological infrastructure, and technology access.

II. RESEARCH METHOD USED

A. This study was to examine the technology integration practices and support needs of Sta. Lucia Junior High School educators of the Division of Pasig City. Specifically, it sought to answer the following questions:

1. What is the profile of the school in terms of:
 - 1.1 technology available for instruction
 - 1.2 Faculty
 - 1.2.1 skills on technology concepts operation
 - 1.2.2 knowledge on creating environment for learning
2. What is the description of the Instructional Technology Onsite in terms of:

- 2.1 utilization
- 2.2 access
- 2.3 support
- 3. What is the level of school effectiveness in terms of:
 - 3.1 student performance
 - 3.2 teacher performance
- 4. What is the relationship between the status of the instructional technology onsite and the schools' level of effectiveness?
- 5. What barriers encountered in technology integration by the:
 - 5.1 teacher
 - 5.2 school
- 6. What are the solutions to address the barriers in technology integration in teaching as given by the:
 - 6.1 teachers
 - 6.2 school
- 7. What framework of technology integration in teaching can be developed based on the findings of the study?

B. This study aimed to explain the conditions associated with technology integration regarding Sta. Lucia Junior High School Teachers' concerns and needs. A descriptive, qualitative interview method, and quantitative research method was appropriate. According to Yemothy (2015) as mentioned by Lodico, Spaulding, and Voegtle (2010). It is also used when researchers want to collect data to "examine current attitudes, beliefs, and opinions or practices about a specific group of people" (Creswell, 2013). Because the researcher will collect data at a specific point in time at a specific location to examine the current attitudes, beliefs, and opinions of a specific group of people, i.e. educators at the Division of Pasig City, this approach was appropriate for the study.

C. Population Frame and Sampling Scheme

The study utilized the purposive sampling scheme, also referred to as a judgmental or expert sample. The main objective of a purposive sample is to produce a sample that can be logically assumed to be representative of the population (Lavrakas, 2008). The population of this study included teachers in different subject area of all grade levels in Sta. Lucia High schools in the Division of Pasig City. Purposive sampling was used in this study since junior high school teachers are more inclined in using technology integration in the classroom. Teachers from teacher I to master teacher in every subject area are the participant. The researcher distributed the questionnaires to the study population (150) but only 140 or 93.33% percent returned the questionnaire despite the constant follow-ups for a period of four weeks. At any rate, the researcher decided to push through with the tabulation and statistical treatment of data since the sample was considered to be adequate based on the percentage.

III. RESEARCH INSTRUMENT

In order to determine the relationship between technology integration (access of programs and use of devices) and self-

perceived barriers to technology integration, questionnaire was used in the study.

Questionnaire

A modified researcher-made questionnaire was employed to gather data from the respondents reflected (a) the school respondents' profile as to population, principal level and years of existence. (b) the respondents' level of technology integration in classroom instruction, (c) the respondents' assessment on the professional development activities with regards to the development of technology skills, and (d) the respondents evaluation on the professional development activities in relation to their technology integration. (e) Technology access and usage, (f) Technology barriers and concerns and (g) Technology support was based on the study of Nicole Elizabeth Yemothy (2015). Questions on this part were adapted from Yemothy's work; however, some new items are added to the instrument.

Validation of the Questionnaire Used

The questionnaire was validated by an expert who is a Master teacher with at least ten years of teaching and the head teacher of our school.

After the validation, the researcher distributed a survey questionnaire for field test to ten respondents who are teaching in the junior high school level. After the survey questionnaire has been answered, the researcher asked for any suggestions to ensure the validity of the instrument.

Unstructured Interview

A random sample of 50 teachers were subjected to unstructured interview. An unstructured interview is an interview in which questions are not prearranged although some questions may be prepared in advance, allowing for spontaneity and for questions to develop during the course of the interview. The questions clarified and expanded the responses from the questionnaire. The unstructured interview questions focused on the purpose of the teachers use of technology, technology available for instruction, technology onsite and the schools level of effectiveness, barriers encountered in technology integration and solution to the barriers for technology integration.

The questionnaire data and the interview information were combined for analysis.

The researcher used the Likert scale with the following range of scores and verbal interpretations

Scale	Range of Score	Verbal Interpretation
4	3.50 – 4.00	Fully Utilize/Always
3	2.50 – 3.49	Utilize/Often
2	1.50 – 2.49	Moderately Utilize/Seldom
1	1.00 – 1.49	Not Utilize/Never

Statistical Analysis of Data

The researcher used for the frequency distribution, the percentage method, the mean score, and the Multiple linear regression for analysis of data.

1. Frequency distribution (Agresti & Finlay, 2009)

This was used to describe the respondents. A frequency distribution lists data value (either individually, or by groups of intervals), along with their corresponding frequencies. This answered research question number 1.

2. Percentage (Sprinthall, 2011)

This was used to identify the distribution of the respondents regarding their profile, and their technology integration levels. This test was used to show a percentage of the responses of the respondents in each of the questions incorporated in the questionnaire.

Thus formula:

$$P = \frac{F}{N} \times 100$$

Where:

P = percentage

F = frequency

N = total number of respondents

3. Weighted Mean (Triola, 2012)

The mean score was used to evaluate the assessment of the respondents on the professional development activities they participated in developing technology skills. It was used to show an average tally of the responses of the respondents in each of the questions incorporated in the questionnaire. Thus formula:

$$\bar{X} = \frac{\sum X}{N}$$

Where:

X = Mean

\sum = Summation

X = Scores

N = Number of scores

4. Multiple linear regression was used to answer research question number 4. To determine the relationship between the status of the instructional technology onsite and the schools' level of effectiveness. As a predictive analysis, the multiple linear regression was used to explain the relationship between one continuous dependent variable (level of school effectiveness) and two or more independent variables (instructional technology onsite in terms of utilization, access and support).

Formula:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$$

IV. PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This chapter covers the presentation, analysis and interpretation of the data in the light of the research questions formulated in the study.

1. The Profile of the Schools

The following tables illustrate the profile of the Respondents.

1.1 Technology available for instruction.

Table 1 presents the respondent-school profile in terms of technology available for instruction.

Technology available	Frequency
Computer	51
Internet in every classroom	5
Television	25
Projectors	17
Scientific calculator	10
Total	108

Table 1. Demonstrates that majority of the technology available to the junior public high school is computers as indicated by the frequency 51 or 47.22 percent television is the second in rank with the frequency of 25 05 23.15 percent, and the third in rank is projectors with the frequency of 17 or 15.74. It really shows that there is a need of allotment in funding and procuring of some of these instructional technology in. In an interview with the respondents revealed that,

"More often than not, I always use television and computers for effective delivery of my concepts."

Another teacher revealed,

"I developed my lecture presentation through power point presentation with the use of projectors to facilitate ease in delivering my lectures."

The Department of Education (DepED, 2013) reported that the majority of teachers used technology to develop lesson plans aligned with the curriculum, organize as well as monitor student data, create presentations, and communicate with students, parents, and colleagues (Kusano, K., Frederiksen, S., Jones, 2013). Although this is progressive, educators need to advance their technological skills and usage to align with the increasing demand of 21st century technology advancements. According to Thompson (2013) best practice for successful technology integration, indicated the usage of technology as a tool or manipulative rather than a stand-alone curriculum.

1.2 Faculty

1.2.1 Skills on Technology Concepts Operation.

Table 2 show the respondent-school profile in terms of technology available for instruction.

Skills on Technology Concepts Operation	Mean	Verbal Interpretation
Identify the basic features of a computer	3.51	Very Competent
Use basic technology terms in conversations	3.36	Competent
Navigate simple menus on the screen (e.g. to print a document)	3.62	Very Competent
Use electronic devices to do simple tasks	3.29	Competent
Create multimedia presentations that include graphics	3.40	Competent
Create documents using a word or excel processing program	3.20	Competent

Navigate in virtual environment (e.g. internet, academic websites, etc.) that are developmentally appropriate	3.33	Competent
Over-all Mean	3.39	Competent

Data reveal that the respondents assessed that they are very competent in navigating simple menus on the screen (e.g. to print a document) as indicated by the mean score of 3.62, followed immediately in identifying the basic features of a computer based from the mean score of 3.51. The respondents' lowest assessment was that they are competent in using electronic devices to do simple tasks based from the mean score of 3.29, and that they are competent in creating documents using a word or excel processing program based from the mean score of 3.20.

The findings confirm that the junior high school teachers have the knowledge to navigate simple menus on the screen. Thus, to know the basic concepts and uses of technology that are using in their day to day instruction. Results of the interview respondents' reveal that,

"I navigate in virtual environment like the internet, academic websites such as Google that are developmentally appropriate to students' learning."

Another respondents' remarked,

"I can use electronic devices to do simple tasks, and create multimedia presentations that include graphics."

Yu (2012) found out that teachers' confidence, competencies, and willingness to use technology directly affects students' engagement and productivity in the classroom with technology. Darling-Hammond (2010) advocated that the more educators use technology in the classroom, the more productive their students become with technology.

1.2.2 Knowledge on Creating Environment for Learning.

Table 3 shows the respondent-school profile in terms of technology available for instruction.

It was found out that the teachers are very competent in applying technology to develop students' higher order thinking skills and creativity based from the mean score of 3.54, followed immediately that they are competent in transforming traditional lectures into a very lively discussion by using multimedia presentations as indicated from the mean score of 3.47.

The teachers' assessment was that they are competent in using technology based games or simulations in my classroom as indicated from the mean score of 3.18, and that they are competent in evaluating technology resources for accuracy and suitability as described from the mean score of 3.02.

Table 3. Faculty-respondents' Profile as to Skills and Knowledge on Creating Environment for Learning

Creating Environment for Learning	Mean	Verbal Interpretation
Plan for the management of technology resources within the context of learning activities	3.19	Competent
Develop learning activities that may result in my students being comfortable using technology in learning.	3.37	Competent
Design learning opportunities that apply technology-enhanced strategies to support the diverse needs of students	3.33	Competent
Transform traditional lectures into a very lively discussion by using multimedia presentations	3.47	Competent
Apply technology to develop students higher order thinking skills and creativity	3.54	Very Competent
Use technology based games or simulations in my classroom	3.18	Competent
Evaluate technology resources for accuracy and suitability	3.02	Competent
Over-all Mean	3.30	Competent

The findings revealed that the teachers need to be prepared to empower students with the advantages technology can bring. Schools and classrooms, both real and virtual, must have teachers who are equipped with technology resources and skills and who can effectively teach the subject matter incorporating technology concepts and skills.

In an interview, a respondents said,

"I develop learning activities that helps the students comfortable in the use of technology in learning."

Another teacher uttered,

"I make it a point that my students learn by designing learning opportunities through the application of technology-enhanced strategies to support the diverse needs of students."

According to Ertmer (2012) technology integration is the application of technology to facilitate learning through different mediums, provide opportunities for student-centric learning, engage learners, and allow for differentiation and learning preferences. Without this continual focus of technology as a method for achieving desired learning outcomes, technology simply becomes an extraneous, disconnected entity (Thompson, 2013). The technology integration standards, written by International Society of Technology Education (ISTE, 2014), were created as a means to provide educators with guidelines for these types of application, rather than analysing the quantity of technological tools available to students and teachers. As with many educational programs, there are options and different models.

Problem 2. Description of the instructional technology onsite

The following tables illustrate the description of the instructional technology onsite.

2.1 Utilization. Table 4 displays the description of the instructional technology onsite in terms of utilization.

Table reveal that interactive computer simulations and using television as an educational instruction materials are important tools in teaching. Data shows that the first rank is computers were fully utilized as indicated from the mean score of 3.56, Rank second is the television were fully utilized as indicated from the mean score of 3.53. The teachers' lowest assessment was that the internet in every classrooms were utilized as indicated from a mean score of 3.18.

Table 4. Instructional technology onsite in terms of Utilization

Utilization	Mean	Verbal Interpretation
Computer	3.56	Fully utilized
Internet in every classroom	3.18	Utilized
Television	3.53	Fully utilized
Projectors	3.21	Utilized
Scientific calculator	3.40	Utilized
Over-all Mean	2.88	Utilized

The result display that there is a need to install an internet in every classroom to have more effective and productive teaching – learning process. Teachers who maximized the use of technology in education increases the potential of the students to excel in their learning environment. To maintain such an environment in the classroom, administrators and teachers must endlessly understand and maximize the full capabilities of technology using internet in every classroom.

2.2 Access. Table 5 shows the description of the instructional technology onsite in terms of access.

Table 5 illustrate that the teachers assessed that they frequently have an access to projector based from the mean score of 3.30, followed immediately that they have frequently a regular access to computer for teaching as indicated from the mean score of 3.27. The teachers' lowest assessment was that they have frequently access to the internet of the school to an extent as seen from the mean score of 3.07.

Table 5. Instructional technology onsite in terms of Access

Access	Mean	Verbal Interpretation
School provided computer in your classroom	3.17	Frequently
Have an access to the internet of the school	3.07	Frequently
Regularly used computers for instruction	3.27	Frequently
Have an access to television for teaching	3.16	Frequently
Have a regular access to projector for teaching	3.30	Frequently
Regularly scientific calculators used for instruction	3.20	Frequently
Over-all Mean	3.18	Frequently

Data reveal that the teachers maximize the use of projector as a tool for instruction and there is a need of procurement for

additional and updated computers, installation of internet for an interactive, manipulative and accessible to their day to day instruction. Today's classroom teachers need to be prepared to provide technology – supported learning opportunities for their students. Schools and classrooms, both real and virtual, must have teachers who are equipped with technology resources.

As stated by Newbill and Baum (2013) technology forms an intricate part of today's society that is rapidly evolving and advancing on multi-tiered levels. This was confirmed by Dawson and Cavanaugh (2012) who said that despite global advancements in the span and availability of technology, schools rarely maintain the same momentum in access to equipment, educator professional development, and onsite educational support. Despite these drawbacks, educators as a community carry the responsibility for preparing students for a future that includes 21st century technology readiness skills (Larson and Miller, 2012).

2.3 Support. Table 6 indicates the description of the instructional technology onsite in terms of support.

It was found out that the teachers always Identifying the basic features of a computer as rank one as seen from the mean score of 3.74, followed immediately that they always Identifying basic technology terms in conversation as rank two as seen from the mean score of 3.72. The teachers' lowest assessment was that they have frequently receive administrative support as reflected from the mean score of 3.33, and that they frequently have IT help desk team based from the mean score of 3.12.

Table 6. Instructional technology onsite in terms of Support

Support	Mean	Verbal Interpretation
Using electronic devices to do simple tasks.	3.44	Often
Using basic technology terms in conversation	3.72	Often
IT help desk team	3.12	Often
Technology Specialist/Technology Teachers	3.56	Always
Using the basic features of a computer	3.74	Always
Provide funding to purchase desired educational technology	3.42	Often
Receive administrative support	3.33	Often
Provide assistance to use computers in education	3.40	Often
Over-all Mean	3.49	Often

The findings confirm that the instructional technology onsite in terms of support by the administration were often maybe only few who have the opportunity to attend technology training for teachers, thus, allowing them to know the basic concepts and uses of technology for their daily instruction. It also revealed that IT help desk team are needed for them to guide how to use the technology in the classroom activities and presentations, for management tasks, and acquire additional subject matter in support of the teachers' own professional development.

The students become more stifled when the teachers are more apprehensive, constraining, or reserved with technology (Anthony, 2012).

According to Al-Khatib (2011) how schools support technology into the classroom across the curriculum

corresponds with the students' application of technology in their learning.

Problem 3. Schools' Level of Effectiveness

The following tables illustrate the schools' level of effectiveness.

3.1 Student Performance. Table 7 displays the schools' level of effectiveness in terms of the student performance.

Table 7. Schools' Level of Effectiveness in Student Performance

Performance	2015-2016		2016-2017		2017-2018	
	f	%	f	%	f	%
90% and above (Advanced)	25	5	30	6	40	8
85-89 (Proficient)	60	12	55	11	80	16
80-84 (Approaching Proficiency)	290	58	255	51	240	48
75-79 (Developing)	125	25	160	32	150	30
74% and below (Beginning)	0	0	0	0	0	0
Total	500	100	500	100	500	100
Over-all Mean grade	82.84	(Developing)	83.79	(Developing)	84.02	(Developing)

Data show that during school year 2015-2016, there are 290 or 58 percent of the students in have incurred an approaching proficiency whose grades ranges from 80 – 84, followed immediately that 125 or 25 percent were rated developing with grades ranging from 75 – 79, 60 or 12 percent were rated proficient whose grades ranges from 85 – 89, and that 25 or 5 percent were rated advanced whose grades are 90% and above.

On the other hand, during the school year 2016-2017, there are 255 or 51 percent of the students were rated advanced proficiency with grades from 80 – 84, followed immediately by 160 or 32 percent of the students who were rated developing with grades from 75 – 79, 55 or 11 percent were rated proficient whose grades ranges from 85 – 89, and that 30 or 6 percent were rated advanced with grades 90% and above. Moreover, in school year 2017-2018, there are 240 or 48 percent of the students who were rated approaching proficiency whose grades ranges from 80 – 84, followed immediately that 150 or 30 percent were rated developing with grades ranging from 75 – 79, while 80 or 16 percent were rated proficient with grades ranging from 85 – 89, and that 40 or 8 percent were rated advanced whose grades are 90% and above.

3.2 Teacher performance. Table 8 indicates the level of school effectiveness in terms of teacher performance.

Data show that during the SY 2015-2016, there are 47 or 94 percent of the teachers who were rated very satisfactory whose rating ranges from 3.50 – 4.499 followed immediately that 3 or 6 percent were rated outstanding with ratings from 4.50-5.00.

On the other hand, during the SY 2016-2017, there are 46 or 93 percent of the teachers were rated very satisfactory whose rating falls within the 3.50 – 4.499 bracket while 4 or 7 percent were rated outstanding with rating from 4.50 – 5.00. Moreover, during the SY 2017-2018, there were 44 or 87 percent of the teachers were rated very satisfactory whose rating ranges from 3.50-4.499 and that 6 or 13 percent were rated

outstanding whose rating ranges from 4.50-5.00.

Table 8. Schools' Level of Effectiveness in terms of Teacher Performance

Performance Rating	2015-2016		2016-2017		2017-2018	
	f	%	f	%	f	%
4.50-5.00 (Outstanding)	3	6	4	7	6	13
3.50 – 4.499 (Very Satisfactory)	47	94	46	93	44	87
2.50-3.499 (Satisfactory)	0	0	0	0	0	0
1.50 – 2.499 (Fair)	0	0	0	0	0	0
1 – 1.499 (Poor)	0	0	0	0	0	0
Total	50	100	50	100	50	100
	4.27 (Very Satisfactory)		4.36 (Very Satisfactory)		4.49 (Very Satisfactory)	

The IPCRF or Individual Commitment and Review Form shows what the teacher has been done for the school year. It reflects the teachers' instructional performance in terms of effectiveness and efficiency. It is an indicative result based on the competencies of classroom teachers as evaluated by school head or head teacher in the individual performance commitment and review form rating (IPCRF) for the school year 2017-2018.

The teachers who were rated outstanding proves that their performance represents an extraordinary level of achievement and commitment in terms of quality and time, technical skills and knowledge, ingenuity, creativity and initiative. Teachers at this performance level have demonstrated exceptional job mastery in all areas of responsibility. Teachers' achievement and contributions to the organizations are of marked excellence.

On the other hand, teachers who were rated very satisfactory reveal that their performance exceeded expectations. All goals, objectives and target were achieved above the established standards.

Problem 4. Relationship between the status of the instructional technology onsite and the schools' level of effectiveness

Table 9 illustrates the relationship between the status of the instructional technology onsite and the schools' level of effectiveness.

Table 9. Relationship between the status of the instructional technology onsite and the schools' level of effectiveness.

Variables	Level of Effectiveness	r	Correlation	p-comp	Decision	Remarks
Instructional technology onsite	Student performance	0.75	High correlation	0.01	Reject	Significant
	Teacher performance	0.82	High correlation	0.00	Reject	Significant

Student performance. Based on the results of multiple regression r of 0.75 it can be said that there is a high correlation between the instructional technology onsite and the student performance. Moreover, since the p-computed of 0.01 is less than the p-value of 0.05, the hypothesis was rejected and concludes that there is a significant relationship between the instructional technology onsite and the student performance. This implies that the student performance is affected by the schools instructional technology available onsite. This allow learners to work collaboratively, resulting to higher students outcomes.

Teacher performance. Based on the results of multiple regression r of 0.82 it can be said that there is a high correlation between the instructional technology onsite and the teacher performance. Moreover, since the p-computed of 0.00 is less than the p-value of 0.05, the hypothesis was rejected and concludes that there is a significant relationship between the instructional technology onsite and the teacher performance. Data reveals that the teacher performance is affected by the schools instructional technology onsite.

In the pursuit of technology- based classroom, the Department of Education through the DepEd Order No. 42, s. 2016 promotes ICT integration in teaching and learning. The teachers are encouraged to create and submit electronic daily lesson logs, and to integrate technology in all aspects of the

lesson plan. Various instructional technology can be used to deliver the lesson plan. This allows learners to work collaboratively, resulting to higher academic achievement of the students. With this DepEd order, teachers unceasingly adopt technology integration, allowing them to explore the features present to the technology.

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