



Technology-Based Instructions

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ABSTRACT

This research determined the academic performance of the grade 5 learners of West Toledo District, Toledo City Division, Toledo City, Cebu, the Philippines in the Grade 5 Science competencies with the integration of the technology-based instruction during the school year 2020- 2021. The descriptive research method was employed to gather the necessary quantitative data to determine the effectiveness of using technology-based instruction in teaching grade 5 Science with the identified competencies. The questioners for the Grades 5 learners were adopted from the Department of Education (Central Office) Alternative Delivery Modules (ADM), used by all the elementary schools in the Philippines. The result of the study revealed that using the technology-based instructions in teaching grade 5 Science enhanced the academic performance of the grade 5 learners. It is proven with a very satisfactory rating. It is proven further the 63% of the grade 5 learners got a very satisfactory rating. It is recommended that the learning scheme for grade 5 science content using technology-based instruction be adopted and be implemented. The Science teachers must adopt the technology-based instruction for the learners' high performance not only for West Toledo District, Toledo City Division, and also to the entire Toledo city Division.

Keywords: Science competencies Technology-based Instruction Academic Performance

1. INTRODUCTION

There are numerous reasons why we should impart technology to a traditional classroom setting. One reason would be is the accessibility of the information. Learners need not go to libraries and do research. Search engines and e-books are replacing traditional textbooks. Instead of personal tutors, students can get one-on-one help through educational videos – anytime and anywhere. Technology supports

different types of learners. Every learner is unique, in the sense that they learn based on their capability, but with the aid of technology, this can be addressed. Technology connects students to the real world. A Science teacher can have a discussion of the different types of landscapes by letting the students have a virtual tour. A history teacher walks along the corridors of Fort San Pedro. Technology allows educators to remove the physical barriers of the classroom, offering students a way to connect the curriculum with the real world. (Sutherland, 2020)

The advantage of using technology in a classroom setting are as follows: 1. Creates a more Engaged Environment. Others would think that technology is a hindrance in your discussion, but you can use this to encourage your learners to participate actively and turn your boring topics into enjoyable ones. 2. Cater different learning styles. Each learner is different and it is very challenging on the part of the teacher to adjust from one learner to another. Thanks to technology, it can modify your lessons. 3. Prepares Children for the future. According to a Comp TIA study, nine out of 10 students indicated that using technology in the classroom would help prepare them for the digital future. § By teaching students skills like PowerPoint, you can help set your students up for success. Introducing instructional technology in the classroom at a young age can help prepare students for future digital demands. 4. Connect you with your learner. With the aid of technology, your relationship with your learners doesn't stop in the four corners of the room. You can message them using Facebook and messenger. Or a video call perhaps. (Waldenu.edu, 2020)

Teachers use technology for administrative purposes, technology education, non-educational purposes, instructional preparation, teacher-directed instructional delivery, student homework, and instructional assessment (Kurt, 2013). The most commonly used for instructional purposes is Powerpoint (Ruggiero & Mong, 2015) which appears to be an extension of traditional teaching strategy. When examined based on the perspective of the students, teachers allow them to use technology in their class in the form of smartphones in making notes, revising, and information gathering (Sormunen, Lavonen & Juuti, 2014).

On the lighter side, teachers had used technology for enhancement of lessons such as for music-related activities such as in creating songs, rehearsals/performances, teaching instrument use, using virtual instruments, audio/video recording, and listening resources (Riley, 2013). The introduction of mobile-device and tablets in schools shifted how the students learn. According to Thomson, Bridgstock & Willems (2014), it has led to the polarization of teachers who use technology. There are those classified as innovative teachers who shifted from a teacher-centered approach to a learner-centered approach. Thomson and his colleagues stated that these teachers transformed their lessons by the advantages that tablet computers can offer. But there are also those regarded as instrumental teachers who seem to use the device as a book behind the glass.

Social media networking had been utilized as well for instructional purposes in the classroom. It has been used by teachers to promote teacher-students and

students-students interaction (Aydin, 2014). However, the results of the study done by Aydin reveal that students prefer passive behaviors in terms of their interaction with their teachers. Aydin recommended additional related studies that intend to explore the possible factors affecting the level of interaction between teachers-students and students-students in social media networking. Beyond understanding the role of technology in deepening the interaction between the teachers and the students, collaboration in social media platforms thru knowledge sharing has been examined in the existing literature.

Republic Act No. 10533 Otherwise Known as K-12 Law is an act enhancing the Philippine Basic Education System by strengthening its curriculum and increasing the number of years for Basic Education, appropriating funds for other purposes. A law that implements the K to 12 Program that covers kindergarten and 12 years of basic education. It aims to produce Filipino graduates who are holistically developed with 21st-century skills. This curriculum also gives great chance to all graduates to acquire middle-level skills for better work opportunities.

Integrating technology into teaching and learning is not a new challenge for universities. Since the 1900s, administrators and faculty have grappled with how to effectively use technical innovations such as video and audio recordings, email, and teleconferencing to augment or replace traditional instructional delivery methods (Kaware & Sain, 2015; Westera, 2015). Appropriate use of technology can serve the regular education classroom by motivating students in all disciplines, such as math, social studies, and literacy (Heafner, 2004; Liu, 2016; Housand & Housand, 2012).

With the legal mandate of promoting the right of all citizens to take appropriate steps in making education accessible to all, the Department of Education (DepEd) is geared towards the transformation of education through the DepEd Computerization Program (DCP). DCP aims to provide public schools with appropriate technologies that would enhance the teaching-learning process and meet the challenges of the 21st century. This program shall respond to the computer backlog of public schools by providing the hardware and software, and training on simple troubleshooting.

The use of information and communication technology (ICT) in schools has increased dramatically in recent years (Orlando, 2014). This has been driven by the recognition that students need to be skilled in the use of these technologies to participate effectively in an increasingly digital world (Buabeng-Andoh, 2012; De Bortoli, Buckley, Underwood, O'Grady & Gebhardt, 2013); as well as a growing awareness of the benefits of digital technology for learning (Dwyer, 2007); and policies and programs aimed at increasing students' access to and use of ICT (Dandolo Partners, 2013; Moyle, 2010).

One of the defining features of development today is the relationship between education and technology, stimulated by the spectacular growth in internet connectivity and mobile penetration. We live in a connected world. An estimated 40% of the world's population now uses the internet and this number is growing at a

remarkable rate.^[2] While there are significant variations in internet connectivity among countries and regions, the number of households with such links in the global South has now overtaken those in the global North. Moreover, over 70% of mobile telephone subscriptions worldwide are now in the global South.^[3] Five billion people are expected to go from no to full connectivity within the next twenty years.^[4] However, there are still significant gaps among countries and regions, for example between urban and rural areas. Limited broadband speed and lack of connectivity hamper access to knowledge, participation in society, and economic development.^[5] https://en.wikipedia.org/wiki/Education_and_technology

Teachers and administrators are constantly searching for new ideas to make classrooms more technology-friendly. Mastering technology can transform a classroom (Davis, 1997, 49). Can we make better students through the use of technology? "Skills cannot be acquired through simply teaching facts but, instead, can be acquired by providing the learner with an opportunity to interact with the content, define learning goals, and explore new understandings through authentic, challenging tasks" (Isernhagen, 1999, 30). For this reason, technology integration is becoming more important in public schools. Students are now more confident using computers (i.e. to take standardized tests presently and in the future).

In addition, the Common Core Standards include many standards that require technology use by students, beginning at the Kindergarten level, for standards to be met. Essentially, this means that all classrooms and students will be required to integrate technology to meet the standards. Another reason technology is a factor to improve learning is the fact that technology is becoming such an integral part of our everyday world. Most jobs today require some type of technology use. Also, students and adults are using technology to communicate, get information in multiple ways. The prevalent daily use of www technology in people's lives overall makes the use of technology very relevant to the students and provides a connection that will greatly benefit student learning.

Many teachers and teacher educators remain uncertain about how to meaningfully integrate this technology or assess its impacts (Crook 2012).

Computer-mediated communications" or CMC is another important idea in current e-education. CMC is communication between people that utilizes at least two electronic devices. CMC examples include instant messaging and email as well as chat rooms and online forums. Social networks such as Facebook and Twitter are part of the CMC paradigm. CMC interactions between teachers and learners are primarily mediated by some type of computer system. The teacher's and students' interactions are often done in any student or faculty learning lounge where the internet or any educational materials are provided most especially the internet connection.

CMC requires educator/tutor facilitation. Computer-based training or learning usually refers to some type of self-study learning that does not directly involve a teacher or educator. Information and Communication Technology (ICT) currently

provides sophisticated tools for sustaining learning communities of many different types. Large high technology companies such as Google, Microsoft, and Verizon now fund schools while also providing this school with the capability of teaching their students via technology. The teaching-learning process of this educational system is usually done by the teacher and students in a very conducive area mostly in a lounge where the said instructional facilities are provided.

<https://en.Educational technology/2015>

2. METHODS

Research Design

This research utilized the descriptive method to gather the necessary quantitative data to determine the effectiveness of using technology-based instruction in teaching the grade 5 Science with the identified competencies. The questioners for the Grades 5 learners were adopted from the Department of Education (Central Office) Alternative Delivery Modules (ADM), used by all the elementary schools in the Philippines. Questionnaires were administered to the 30 classroom teachers and learners for evaluation.

Research Respondents

The respondents of the research were the 15 classroom teachers and the 135 Grades 5 learners of the identified small, medium, and big elementary schools of the west district of Toledo city division. They were chosen to validate the effectiveness of using technology-based instruction in a classroom setting.

Data Collection Tools

This research used the adopted instrument from the National Assessment and Educational Progress (2019). Survey Questionnaires were administered as part of the NAEP Assessment and collected contextual information about learners, opportunities to learn in and out of the classroom. There were two – sets of questionnaires- one for Classroom Teachers and the learners. The questioners for the Grades 5 learners were adopted from the Department of Education (Central Office) Alternative Delivery Modules (ADM) which was used by all the elementary schools in the Philippines. The questionnaires for the pupils and teachers had proximity of content. It asked responses only on the adequacy and determined the effectiveness of using technology-based instruction in a classroom setting and how it affects the academic performance of the learners in the Science subject with the identified competencies.

3. RESULTS

Table 1 Exposure To Social Media Sites (Grade 5 Learners)

Indicators	Grade 5 Learners	x	%
Facebook	30	30	22.22
Messenger	30	30	22.22
Instagram	5	5	3.70
Twitter	15	15	11.11
TikTok	20	20	14.81
Whatsapp	3	3	2.22
Youtube	27	27	20
others	5	5	3.70
Total:	135	135	100

The table above shows the exposure of the Grade 5 learners to social media sites. There were 135 learners rated in terms of exposure to social media sites. Based on the result, Facebook and messenger had the highest number of learner users with 30 (22.22%) respectively; the second was youtube with 27 (20%) learner users. The third was TikTok with 20 (14.81%) learner users; the fourth was Twitter with 15 (11.11%) learner users, while Instagram and others were tied at 5 (3.70%) learner users each and lastly is Whatsapp with only 3 (2.22%) learner users.

Table 2 Technology-Based Instruction Used In Grade 5 Science subject (Social Media Websites Used by the Grade 5 Science teachers)

Indicators	Grade 5 Teachers	x	%
Facebook	3	3	20
Messenger	5	5	33.33
Zoom	3	3	20
Google class	2	2	13.33
Youtube	2	2	13.33
Total:	15	15	100

The table above indicates the Technology-based Instruction used in Grade 5 Science by the grade 5 science teachers. It is shown that Messenger had the highest number of teacher users with 5 (33.33%). A Facebook and zoom ranked second with 3 (20.00%) teachers each and the last were the Google classroom and Youtube with 2 (13.33%) teacher users.

Table 3 Academic Performance Of Grade 5 Learners In Grade 5 Science Contents

Competencies	O	VS	S	FS	F	x	%
	5	4	3	2	1		
Competency 1	3	34	23	12	0	72	53.33
Competency 2	6	17	4	5	0	32	23.70
Competency 3	10	12	1	8	0	31	22.96
Total:	19	63	28	25	0	135	100
Interpretation:	Very Satisfactory						

Legend:			75-79	FS	Fairly Satisfactory
90-above	O	Outstanding	70-74	F	Failed
85-89	VS	Very Satisfactory		X	Sum
80-84	S	Satisfactory		%	Percentage

The table above presents the 135 learner respondents with the Academic Performance in the given competencies of the grade 5 Science contents. For competency 1, 3 learners got a rating of outstanding; 34 got a very satisfactory rating; 23 got a satisfactory rating, and 12 got a fairly satisfactory rating. For Competency number 2, 6 learners got the rating of outstanding, 17 got a very satisfactory rating, 4 got a satisfactory rating, and 5 got a fairly satisfactory rating. In Competency 3, 10 learners got the rating of outstanding, 12 got a very satisfactory rating, 1 got a satisfactory rating, and 8 got a fairly satisfactory rating.

4. DISCUSSION AND CONCLUSION

4.1 DISCUSSION

Learners were engaged more on Facebook and Messenger as the social media sites. Whatsapp had the very least number of learner users.

On the other hand, the messenger had the highest number of teacher users with 5 (33.33%). A Facebook and zoom ranked second with 3 (20.00%) teacher users

each and the last were the Google classroom and Youtube with 2 (13.33%) teacher users.

The grade 5 learners using the technology-based instruction in the grade 5 Science competencies got a very satisfactory rating.

4.2 CONCLUSION

The academic performance of the grade 5 learners of the identified small, medium, and big Elementary schools of the west district of Toledo City division in grade 5 Science competencies were very satisfactorily rated with the use of the technology-based instructions.

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