Project UPCODE:
Un-locking the Potential of Chatbot in Online-offline Distance Education: Basis for Supplementary Material in the New Normal of Selected Grade Five Students in Malaban Elementary School

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ABSTRACT

Today's technology opens various options for what best services it offers. Technology in education is not new, but it evolves to adapt to the needs of the students. Chatbots in social media provide instant chat to customers' queries. Only people know that chatbots can assist distant and struggling learners (Jain, Kumar, Kota, & Patel, 2018). This research aims to determine the effectiveness of instant chat in blended learning. And if the chatbot helps students increase their scores in math. In Malaban, the school offers face-to-face and self-learning modules. The researchers implemented Project UPCODE to determine the effect of the instant message on the selected Grade five students. It is a computer program designed to simulate conversation with human users, especially over the Internet", Lexicon Dictionaries (2019). The lesson in chatbot was focused on Mathematics, considering its complexity to be explained by the parents busy with their jobs.

The researchers used the quantitative method of research using the pretest-posttest design. A convenience sampling technique was used to choose the respondents of the study. Forty (40) students were divided into two groups. Twenty (20) students were referred to as the control group and twenty (20) students as the experimental group. Frequencies, simple percentages, mean, standard deviation, and t-test were used to treat the gathered data. The study revealed an increase in the post-test scores of the control (M = 7.5, SD = 2.19, N = 20)and experimental groups (M = 13.9, SD = 2.48, N = 20). It was concluded that using the UPCODE as supplemental material significantly enhanced students' scores in math. The researchers recommended using chatbots as supplemental material to assist students become confident in dealing with math subjects.

UPCODE, in times of pandemic and calamity, serves its potential to the fullest as the students most need the tutorials of lessons. At the same time, teachers do the tasks virtually by connecting to the Chatbot Program. The success of this research will open the path to automating our tasks since we (teachers) are still determining what will happen in the future.

Keywords: *Chatbot, blended learning, instant chat,*

INTRODUCTION

Education plays an important role in shaping the minds of the students. Good material has a great impact on student acquisition of knowledge. For this reason, DepEd Order 12 s. 2020 Section 3b anchored on the principle of aligning materials to the needs of the students in the new normal set-up were always evident in all learning materials. Since the peak of Covid 19, the Modular Distance Learning (MDL) approach has been implemented from Malaban Elementary School with a total of 3000 students from the school year 2021-2022. This study will be concerned that the successful teaching-learning process to be attained is limited only to printed modules and cannot provide full learning unless the guidance of the parents or teacher is achieved.

The idea of CHATBOT in a better normal has been promising to the teachers of grade five since they deal with tons of messages every day from parents asking for support. A chatbot is "A computer program designed to simulate conversation with human users, especially over the Internet", Lexicon Dictionaries (2019). It communicates in human language with people or other chatbots using Natural Language Processing (NLP) and sentiment analysis via text or oral voice Khanna et al., 2015).

Chatbots are also known as artificial conversation beings, interactive agents, smart bots, and digital assistants.

Alexa Lemzy (2020), chatbot will deliver online and offline interactive lessons at the most convenient time for the students. This research study aims to determine if Project UPCODE will provide assistance to the Mathematics performance of selected Grade 5 students of Malaban Elementary School at Binan City for the School Year 2021 – 2022. Researchers choose Mathematics because of its critical rank among 58 countries. The Philippines scored 297 in math and 249 in science, according to the Trends in International Mathematics and Science Study (TIMSS) 2019 by the International Association for the Evaluation of Educational Achievement (IEA). The researchers will create supplemental material to support the blended learning (distance and limited face-to-face) of the students since fifty percent capacity is allowed only due to the risk of possible Covid 19 transmission.

Chatbots and instant messaging, according to Alexa Lemzy (2020), will play a significant part in the future of education, not simply during the present situation. These technologies are currently commonplace and provide numerous advantages to both educators and students. Adapting your teaching style to accommodate these tools can improve your students' learning experience and help them succeed.

METHODOLOGY

The study determines the effect of chatbot on math scores of Grade 5 students of Malaban Elementary School in the Division of Biñan City.

The researchers used a quasi-experimental method of research using pretest-posttest design. Forty (40) selected students were divided into control and experimental groups. Students were determined using the convenience sampling technique because there is still a threat of covid 19 transmission. Frequencies, simple percentage, mean, standard deviation, and t-test were used to treat the gathered data.

The scores obtained by the respondents were categorized as follows:

Scores	Description
17 - 20	Excellent
13 - 16	Very Proficient
9 - 12	Proficient
5 - 8	Less Proficient
1 - 4	Poor

The standardized questionnaires on the first grading period was then developed following the MELC (Most Essential Learning Competencies). It was conducted twice in both groups. The first set of standardized Questionnaires was given before the treatment was applied, this served their pre-test. Two months after the application of manychat app in addition to modular learning, the second set of standardized test questionnaires was again conducted to both groups this time it served as their posttest.

To adhere with ethical considerations and standards, all

participants were informed of the study. Matters about the Data Privacy were elaborated and clarified, with proper adherence to RA 10173, or the Data Privacy Act of 2012.

RESULTS

The result and interpretation of data were organized. The study revealed that UPCODE effects the math scores of Grade 5 students in Malaban Elementary School, Binan City.

A. Results

Table 1. Students' Test in Grade 5 Mathematics

		Control Group (n = 20)				Experimental Group (n = 20)			
		Pretest		Posttest		Pretest		Posttest	
Scores	Description	f	%	f	%	f	%	f	%
17 - 20	Excellent	0	0%	0	0	0	0%	4	20%
13 - 16	Very Proficient	0	0%	0	0	0	0%	9	45%
9 - 12	Proficient	1	5%	7	35%	2	10%	7	35%
5 - 8	Less Proficient	6	30%	11	55%	5	25%	0	0%
1 - 4	Poor	13	65%	2	10%	13	65%	0	0%
	Mean:	4.1	100%	7.5	100%	4.3	100%	13.9	100%
	StDev:	2.37		2.19		2.71		2.48	

Table 1 showed the pretest scores obtained by the respondents in the experimental group with a level of proficiency (M = 4.3, SD = 2.71). This suggests that they should work on improving their mathematics abilities. More drills, examples, assignments, and board work were required to assist the students' analytical skills.

Furthermore, the table shows an increasing result of the posttest scores of the experimental group. It implies that there was an increase in learning among students. Thus, it further connotes that the chatbot has contributed to enhanced student learning. Waldener (2019), The teaching-as-communication process is at work when a chatbot is developed for educational purposes, more specifically to consolidate, repeat, and practice the material learned in school. When using a chatbot, the chatbot assumes the primary responsibility for making a lasting level of information rather than the teacher.

According to Rossing et al. (2012), The growing use of mobile technology in educational contexts indicates that lessons, investigations, and even communications between student workers will all be largely reliant on mobile applications in the future. Park (2011) argues that as mobile devices have become more common, many teachers have integrated technology into their classrooms and learning settings.

Table 2. Significant Relationship Between Grade 5 Math and Pretest Score

Group	r	strength	t-Value	df	Critical Value	Significance	Decision
A. Control							
Grade 5 Math Pretest Score	1	strong	-7.406	19	0.05	significant	Reject H_o
B. Experimental							
Grade 5 Math Pretest Score	1	strong	-16.209	19	0.05	significant	Reject H_o

Table 2 shows the relationship of pretest scores of the experimental group. The table shows the relationship between the Grade 5 mathematics and students' pretest scores. The data revealed that the scores of students in both groups have no significant differences from the results of their pretest scores.

According to their scores, Grade 5 students were ideal respondents of the study because they needed intervention and materials that helps improve their scores. That means that a chatbot can communicate with people in a very human-like way by reacting correctly to users' inputs. In the best case, the people that communicate with the chatbot do not recognize that they are communicating with a computer program but instead with another human being (Abdul-Kader & Woods, 2015; Jain et al., 2018). When ICT integrates with any subject gives a significant result.

Table 3. Significant Relationship Between Grade 5 Math and Posttest Score

Group	r	strength	t-Value	df	Critical Value	Significance	Decision
A. Control							
Grade 5 Math Posttest Score	-.265	strong	-7.406	19	0.05	significant	Reject H_o
B. Experimental							
Grade 5 Math Posttest Score	.523	strong	-16.209	19	0.05	significant	Reject H_o

Table 3 presents the relationship between Grade 5 Mathematics and posttest scores of the experimental group. The table reveals that computed r -values have a weak positive relationship between the Grade 5 mathematics and their scores in the post-test. Also, it is revealed that the experimental group has no significant differences from the results of their posttest scores.

Clark (2015) revealed the student participants responded favorably to the intervention and experienced an increase in their engagement

compared to the traditional classroom experience. Regarding academic performance, no significant changes were demonstrated between the intervention and those taught in a conventional classroom environment. The study of Hill et al. (2005) explored whether and how teachers' mathematical knowledge for teaching contributes to gains in students' mathematics achievement. They found that the mathematical knowledge of teachers was significantly related to student achievement gains in both grades after controlling for the crucial student- and teacher-level covariates.

As indicated, Fuchs et al. (2005) say that mentoring diminished the commonness of math incapacity, with pervasiveness and seriousness changing as a component of a recognizable proof technique and math area. Consideration represented great fluctuation in anticipating every part of end-of-year math execution

Table 4. Significant Relationship Between Pretest and Posttest Score

Group	r	strength	t-Value	df	Critical Value	Significance	Decision
A. Control							
Grade 5 Math	-0.05	weak	-4.65	19	0.05	significant	Reject H_o
Pretest Score							
Posttest Score							
B. Experimental							
Grade 5 Math	0.52	strong	-15.59	19	0.05	significant	Reject H_o
Pretest Score							
Posttest Score							

Table 4 shows the test of a relationship between pretest and posttest scores. The table reveals increasing results in their posttest. It further implies that there is an increase in learning among Grade 5 students. The results indicate the acceptance of the null hypothesis, which says that there is no significant difference between students' pretest and post-test scores of the control group. The results indicated a significant improvement in the achievement of the experimental group. Students who used the chatbot in their studies reported greater motivation than students who did not experience supplemental materials. Prior knowledge of mathematics did not play significant role in the achievement of the experimental group.

The findings of the study of Cheung and Slavin (2013) suggest that educational technology produced a positive, though small, effect. Kaloo and Mohan (2012) reveal that the students were able to improve their performance, and they were excited about using a mobile device for learning. They adapted well to using this method of learning for the first time. The students who improved were those who had done algebra in a previous school term but may have been failing the subject. However, the application did not make a significant impact on students who were learning the algebraic content for the first time.

DISCUSSION

The findings of the study are as follows:

Pretest scores of the two groups showed no significant difference (M = 4.3, SD = 2.71) and (M = 4.1, SD = 2.37) which means that respondents had little knowledge of the competencies that will be given during the first grading period. Therefore, the scores suggested that they are ideal to become the respondents to the study.

The table reveals increasing results in their posttest for both groups. Furthermore, it suggests that students in Grade 5 were learning significantly. It accepted the null hypothesis and rejected the alternative, which says that there is no significant difference between students' pretest and post-test scores of the control group. The results indicated a significant improvement in the scores of the experimental versus the control group. Students who were exposed to chatbot increased Mathematics scores compared to students used the module and/or limited face-to-face only. Modular distance learning did not significantly change the performance of the students but it is the only way not to disengage students from the school.

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