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From Face-to-Face to Blended Learning: Development, Validation, and Acceptability of Material Tools in Synchronous and Asynchronous

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A B S T R A C T

The current COVID-19 virus has caused the country's and the world's educational systems to change and shifted classes from face-to-face to blended learning. Classes have been conducted through different online media platforms like Zoom, G-Meet, and Canvas, among others. An obstacle to this is the readiness of the school, teachers, students, parents, and other stakeholders. A strategic tool, technique, and platform are required to maintain students' interest, particularly children, who are increasingly interested in technology, gadgets, and games. This study will attempt to explain the need to develop computer aided materials that could be used by the teacher in synchronous and asynchronous classes, and prove the validity and acceptability of the tool. The study included 73 students and 17 expert teachers from a private school in Manila, Philippines. A diagnostic test was administered to the students' respondents to get the least mastered skills in the 10 parts of speech in Filipino, likewise, a pre- and post-test were also administered; and to determine the acceptability of the tool developed by the researcher, this study used a scale and questionnaire. Students were categorized into the experimental and control groups using random sampling and stanine groupings. A total mean score of 4.61 was obtained in the diagnostic test. A calculated t-value was used to determine if the developed program is accepted or failed to reject and if the p-value exceeds 0.05.

Keywords: Blended learning, Education, ICT integration, Computer Aided Material, Filipino Language and Grammar

INTRODUCTION

In order to attend an online class, a teacher and students need to have reliable and strong bandwidth, or at least basic internet connectivity. This has become an obstacle for the majority of the students in the Philippines, especially in public schools. [1] It is for this reason that the Department of Education (DepEd) has prepared for Self-Learning Modules for New Educations New Normal [2] while classes are prohibited due to the public health situation. The majority of Filipino students still do not have internet access that they can use while studying. This was in contrast to the United Nations resolution, Article 19, in adopting a resolution on "the promotion, protection, and enjoyment of human rights on the internet" [3] which urges government institutions around the world to ensure that the internet must be rights-based and user-centred. [4]

In April 2000, more than 1,100 participants from 164 countries gathered in Dakar, Senegal, for the World Education Forum and agreed upon six wide-ranging education goals to be met by 2015. International agencies pledged that no country engaged in this effort would be hindered by a lack of resources.[5]

This would still pose a challenge to the country's educational system and a call to the government to implement inclusivity so that no student is left behind. However, thanks to the individual efforts of private institutions—schools, colleges, and universities—they were able to bring their classes to students via an online platform. According to the study by Lubangco (2020) which used data from the Family Income and Expenditure Survey of 2015, 77 percent of the households in the country with school-age members paid for internet access in 2015. The percentage of those with cellphone ownership is the highest at 89.22 percent. [6]

Schools may have been successful in bringing their classes to students' homes via various platforms, but quality material should also be considered to stay current with the mode of learning. Further, according to statistics, 65% of the population is a visual learner.[7] Visual reinforcements, such as video content, help visual learners learn (Zopf et al., 2004). [6] Educators needed to rethink the way they taught based on the changes in technology that contributed to 21st century culture.

Instructional materials stimulate students' interest and lead to effective learning (Uenishi 2018) [8]. Its formation and development in learning have been the keys to improving the teaching-learning process. In order for the shift to succeed, the teachers should make the classes "internet-ready." Teachers must adjust their class content, particularly their visual aids, presentations, games, and or materials.

The findings of research on computer-aided instruction (CAI) around the world indicate that the use of CAI is associated with other beneficial outcomes. CAI results in more positive attitudes toward computers, course content, instructional quality, school in general, and self-as-learner than conventional instruction alone (Cotton, 2002). [9]

In a study conducted in Turkey, the use of CAI had greater effects on internal locus of control, school attendance, motivation/time-on-task, and student-student cooperation and collaboration than the use of conventional instruction alone. The use of CAI as a supplement to conventional instruction also produced higher achievement than the use of conventional instruction alone, among others. [10]

In a study conducted in America, the effects of CAI on first-grade student vocabulary development were examined, and it was found that CAI was a motivating medium that enhanced good teaching.[11]

Similar to the study in Pakistan, students understood better the knowledge provided to them through CAI. which indicates the value of this method as a teaching tool. The total gain of CAI is greater than classroom lecture (CRL).[12]

In a study conducted in China, the use of computer-assisted instruction is beneficial in the implementation of physical education programs, mostly in teaching academic concepts and principles.[13]

The previous articles and researchers have established that there are ongoing educational programs that incorporate computer-aided material in the pedagogy of learning. However, the use of computer technology seems effortless for the main reason that many schools in the world have been accustomed to this from face-to-face and now are using it in on-line and blended learning. It is not enough to establish that students really know how to use computers; it is also necessary to cultivate students' skills in: (1) how to get information; (2) how the obtained information will be useful; and (3) how you will know if the information is correct. More trainings for teachers and students are necessary to better implement technology in the classroom. Students are more engaged and comfortable with technology, yet they can become a management concern.[14]

The use of technology in the classroom, whether face-to-face or blended learning, is complicated by a number of underlying factors. One big challenge is how users can successfully use the technology and ensure participants' commitment given their individual learner characteristics and encounters with technology. [15]

This study attempts to confirm that a material tool used by the teacher in the classroom, whether in synchronous or asynchronous sessions, plays a vital role in sustaining and achieving quality of learning amidst the distance, and challenges of today's world brought by the pandemic. Second, this instrument must be validated in order to be effective, and finally, the acceptability of the developed materials must be determined if they still respond to the needs of 21st century education and could be an effective tool in on-line and blended learning outcomes

This study sought to address the following research questions:

1. What is the level of ability of the experimental and control groups in the pre- and post-test according to the results of the developed computer material in the diagnostic test in Filipino?
2. Is there a significant difference in the level of ability of the experimental group after undergoing the developed computer material based on the pre- and post-test scores in the diagnostic test?
3. Is there a significant difference in the effectiveness of the developed computer material according to the evaluation of expert teachers?
4. What is the level of acceptance of the developed computer material in Filipino from the expert's point of view based on content, organization, language, style, creativity, and possible use in synchronous and asynchronous classes?

METHODOLOGY

The study included 73 male students and 17 expert teachers from an exclusive private school in Manila, Philippines. The students were divided into two groups: 30 students for the experimental group and 30 students for the control group. This was done through random sampling and stanine groupings.

A diagnostic test was given in this study to determine the least mastered skill lessons in the ten (10) parts of speech. KAKP computer software is prepared and developed based on the test results. The computer aided material was carefully developed with the help of computer programmers and the researcher to make a realistic animation that can be manipulated through computers, tablets, and cellphones.

The printed documents and a Google Forms online version of both of these tests were administered to the respondents. Their informed consent was obtained, but their identities were kept anonymous.

In order to fulfill the problems set forth in the study, the following statistics were used: (1) To determine the level of students' ability in the diagnostic test, item analysis was used; (2) To determine the students' ability level in the scores obtained in the pre- and post-tests, the mean was used; (3) To find out if there is a significant difference in the mean score of the experimental and control groups in the pre- and post-tests, a dependent t-test was used; (4) To determine the significant difference in the mean score of the control and experimental groups in the post-test, an independent t-test was used; and finally, (5) To determine the acceptability of developed material in Filipino, a weighted mean was used.

RESULTS

The following tables show the data obtained and the statistical treatments applied to them to address the study's research questions.

Table 1: Student Performance on the Diagnostic Test in the Ten Parts of Speech

Bahagi ng Panalita (Part of Speech)	Mean	Sd
Pangngalan (Noun)	5.04	1.68
Panghalip (Pronoun)	4.93	2.08
Pandiwa (Verb)	4.44	1.85
Pang-uri (Adjective)	4.40	2.08
Pang-abay (Adverb)	4.36	2.75
Pantukoy (Ligature)	5.16	1.94
Pangatnig (Conjunction)	**4.09**	**2.18**
Pang-ukol (Preposition)	**4.18**	**2.03**
Pang-angkop (Ligature)	4.89	1.89
Pandamdam (Interjection)	4.58	1.70
Total Mean	***4.61***	

Table 2: Calculated Mean of the Experimental Group in the Topics Conjunction and Preposition in Pre and Post-test

	Pre-test			Post-test		
Topic	$\bar{x}$	**Sd**	**VI**	$\bar{x}$	**Sd**	**VI**
Pangatnig (Conjunction)	10.20	1.92	NI	16.76	0.99	D
Pang-ukol (Preposition)	8.10	2.05	NI	16.83	1.02	D
Total	**9.15**		**NI**	**16.79**		**D**

Table 3: Pre and Post-test Mean of the Control Group on the Topics Conjunction and Preposition

	Pre-Test			Post-Test		
Topic	$\bar{x}$	**Sd**	**VI**	$\bar{x}$	**Sd**	**VI**
Pangatnig (Conjunction)	11.83	2.08	NI	14.40	0.80	B
Pang-ukol (Preposition)	8.27	1.85	NI	13.47	0.90	B
Total	**10.05**		**NI**	**13.93**		**B**

Table 4: Mean Gain of the experimental and control groups in the pre- and post-tests on the topics of conjunction and preposition

Topic	**Experimental Group**			**Control Group**		
	Pre-test	**Post-test**	**Mean Gain**	**Pre-test**	**Post-test**	**Mean Gain**
Pangatnig (Conjunction)	10.20	16.76	6.47	11.83	14.40	2.57
Pang-ukol (Preposition)	8.10	16.83	8.73	8.27	13.47	5.20

Table 5: Calculated t-vale of the Experimental Group based on the Pre- and Post-test

Topic		$\bar{x}$	**t**	**Df**	**p-value**	**Ho**	**VI**
Pangatnig (Conjunction)	Pre-test	10.20	6.97	27	.000	R	S
	Post-test	16.76					
Pang-ukol (Preposition)	Pre-test	8.10	7.59	27	.000	R	S
	Post-test	16.83					

Table 6: Control Group Level of Skills Based on the Post-Test

Topic		$\bar{x}$	**t**	**Df**	**p-value**	**Ho**	**VI**
Pangatnig (Conjunction)	Pre-test	11.83	7.17	27	.000	R	S
	Post-test	14.40					
Pang-ukol (Preposition)	Pre-test	8.27	5.73	27	.000	R	S
	Post-test	13.47					

Table 7: Experimental and Control Group Levels of Skills Based on the Post-Test

Topic	Groups	$\bar{x}$	Df	t-value	p-value	Ho	VI
Pangatnig (Conjunction)	Experimental	16.76	54	0.171	0.865	FR	NS
	Control	14.40					
Pang-ukol (Preposition)	Experimental	16.83	54	0.577	0.566	FR	NS
	Control	13.47					

Table 8: Composite Table of the Evaluator's Level of Acceptance and Use in the Synchronous and Asynchronous Classes

Variable	$\bar{x}$	VI
1. Content	4.47	Very High Acceptance
2. Organization & Presentation	4.56	Very High Acceptance
3. Language & Style	4.51	Very High Acceptance
4. Use (Synchronous classes) (Asynchronous classes)	4.56 4.65	Very High Acceptance
5. Creativity	4.75	Very High Acceptance
Total Mean	**4.59**	**Very High Acceptance**

The illustration shows the sequence of the developed computer material used by the students in answering the assessment.

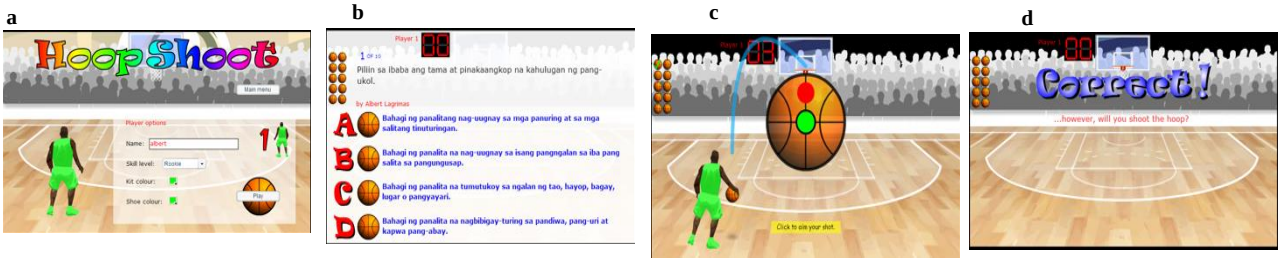

Fig. 1 – (a) Hoopshoot player customization; (b) Assessment test; (c) Ball shooting; (d) Response prompt

DISCUSSION

According to the data in Table 1, the conjunction and preposition had the lowest mean of the 10 parts of speech. It also confirmed that the aforementioned subjects are the students' least mastered language skills. This also confirms that this will be the focus of the topics and program tools developed. A total mean score of 4.61 was obtained on the Diagnostic Test in the 10 parts of speech. This result says that intervention should be made to increase the level of students' ability in the aforementioned language subjects.

Table 2 shows that the experimental group scored 10.20 mean, and 1.92 Sd in Conjunction for Pre-test while 8.10, and 2.05 in the Preposition and both got the verbal interpretation "Needs Improvement". Also, it can be seen that after undergoing the intervention using the developed program in Filipino, in post-test, they obtained a mean of 16.76, and 0.99 Sd in Conjunction while 16.83, and 1.02 in Preposition and both obtained verbal interpretation Developing. The Sd in the table shows that from 'heterogeneous' it became 'homogenous' in the results of the post-test. This means that the students had a common understanding of the subject after using the developed program. Overall, it means that the tool made by the researcher using the developed computer program helped increase the students' ability level in the two topics.

Table 3 presents, after the intervention made using the traditional method in the pedagogy of learning, that in post-test they obtained a mean of 14.40, and a standard deviation of 0.80 in Conjunction while 13.47, and 0.90 in Preposition and both obtained verbal interpretation Beginning. Meanwhile, Sd shows in the table that it changed from "heterogeneous" to "homogeneous" in the post-test. This means that the students also had a common understanding of the subject after being taught in the traditional method. It can also be said that the level of students' ability has increased even though the program was not used in the process of learning.

Table 4 shows that over all, the experimental group obtained a mean gain of 6.47, and the control group had a mean gain of 2.57. Whereas the experimental group obtained a mean gain of 8.73, and the control group had a mean gain of 5.20 in Preposition. It can be interpreted that the experimental group obtained a higher mean gain compared to the control group. This means that the use of the developed program helped the students further increase their ability to learn Filipino in two topics.

Table 5 conveys that there is a significant difference in the level of ability of the experimental group based on the results of the Pre and Post-test in the two topics. In fact, a.000 p-value was recorded and did not exceed the 0.05 level of difference, resulting in the hypothesis being rejected. This means that the experimental group improved their skills, and the program helped them learn the two topics

It is noteworthy to also note that in Table 6, there is a significant difference in the ability level of the control group based on the results of the Pre and Post-test regarding the two language subjects. It also recorded a.000 p-value that did not exceed the 0.05 level of difference, so it resulted in a rejected hypothesis. This means that the control group improved their ability to learn the topics using the traditional method of learning the subject. In the end, the data in the table reflects that the two groups of students achieved the learning expectations, whether or not the program was used to learn the two topics in Filipino.

Table 7 shows, the calculated t-value is 0.171 and 0.577. Therefore, the hypothesis is Accepted or Failed to Reject and there is no significant difference in the result using the developed program. Meanwhile, 0.865 and 0.566 p-values were recorded. This means that there was no significant difference between the experimental and control groups because their p-value exceeded 0.05.

Table 8 reveals a "Very High Acceptance" of the developed tools according to the evaluation and use of the expert teacher respondents. It was given 4.47, 4.56, 4.51, 4.65, and 4.75 calculated mean and verbally interpreted as “Very High Acceptance.” This also obtained a 4.59 calculated mean and has a verbal interpretation of “Very High Acceptance.” This only means that the tool can be used in the classroom for either synchronous or asynchronous classes. The developed program on their gadgets served as an important tool to facilitate teaching and learning in the classroom, and this could be used either in asynchronous or synchronous classes.

CONCLUSIONS

Based on the foregoing, it is concluded that the developed program assisted students in improving their ability to learn the topics. The two groups of students achieved the learning expectations, whether or not the program was used to learn Filipino. The developed program was an additional tool in learning pedagogy that could be used in both synchronous and asynchronous classes. It is also noteworthy that the students had the opportunity to manipulate and choose the knowledge they received and learned with the help of the program, which further aroused the students' interest. The traditional way of teaching and the developed tool can be integrated. Blended learning and hybrid classroom approaches to learning are a combination of traditional teaching methods that use computer technology and can be delivered through face-to-face or online classes, respectively.

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