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RESEARCH ARTICLE

**REMOTE LEARNING BEYOND THE FOUR CORNERS OF THE CLASSROOM FOR STUDENTS
WITH SPECIAL NEEDS USING VIDEO-AIDED REAL TIME CAPTIONING IN LEARNING
CIRCULATORY AND RESPIRATORY SYSTEM**

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Abstract

The Distance learning has become an essential educational option during the COVID-19 pandemic. However, students with varied needs require diverse learning experiences. For example, deaf and hard-of-hearing students need specific accommodations to aid their learning. The main objective of this study is to provide the students with a convenient way of learning despite the threat brought by the pandemic. The utilization of the Video Aided real time captioning to bridge the gap between the modular distance learning printed as adapted by the Department of education. The study employed an experimental method which utilizes the mean percentage score and t-test to analyse the data distribution pattern for each variable. The participants of the study were the hearing impaired learners of Grade 9 John Dalton. Deaf and hard-of-hearing students use a special language for their interactions, which can be challenging in a distance learning environment. Thus, the use of video aided real time captioning as one of the varieties of technological systems, services, and applications, such as virtual classrooms (VCs), can be used to facilitate learning at a distance. It was found out in the study that there is a significant difference between the performance of control and experimental when the application was introduced. Hence, teachers can conduct synchronous lectures whereby they meet students located at different sites at a specified time to provide adequate, reliable and meaningful learning engagement.

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Introduction:-

As the COVID-19 pandemic hit the Philippines in 2020, there was predictable disruption in the provision of both mainstream and disability-specific services for children with disabilities. People with Special Educational Needs and Disabilities (SEND) are confronted with diverse challenges as COVID-19 caused tremendous disruption in face-to-face educational settings. Apart from this situation, teachers are also facing difficulties in making their lessons adaptive and responsive to the educational learning needs of people with SEND.

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With this pandemic time, the big question on why students perform positively or poorly or why they pass or fail in their classes is beyond reproach because of their indifference. Learning who have learning disabilities tend to be discriminated in the school due to their insignificant impairment. There are significant factors contributing to students' success in school during this time of pandemic- their positive response to academic requirements in school and their modular tasks given by the school

Since education is no longer held within the school, parents serve as partners of teachers in education. Parents play a vital role as home facilitators. Their primary role in modular learning is to establish a connection and guide the child. (FlipScience, 2020).

Moreover, the teacher takes the responsibility of monitoring the progress of the learners. The learners may ask assistance from the teacher via e-mail, telephone, text message/instant messaging among others. Where possible, the teacher shall do home visits to learners needing remediation or assistance (Llego,2020)

Hence, the teachers are focusing on providing engaging Learning experiences for normal and students with special needs, 55% of students still find the lack of social interactions troubling. They learn better with fellow students, and for 45% of students, this could lead to underperforming in their academics. Also, students have a strong desire to return to in-person connections. Not seeing other students and faculty in person is having an impact, and even contributes to anxiety, nervousness, and worry. The abrupt change in lifestyle, not limited to online lessons, has left many students struggling with how to succeed academically.

Thus, the researcher opted to conduct this present study to determine the performance of the students with special needs in Video-Aided Real Time Captioning in Learning Circulatory and Respiratory System

Literature Review:-

One of the main goals of educational institutions is the improvement of the learners' academic achievement or performance. While learning is a very significant personal matter, it is hailed to be the reason why parents send their children and why students want to go to school. Despite the threat brought by Covid-19, educators are always challenging themselves to provide students with the most effective instructional tools and resources.

As pandemic force students to stay home, educators are doing their best to quickly transition to remote learning. With regards to this, using video-aided real time captioning and Interpreter is an effective strategy to be used for those students with learning disabilities

Practically, students with disabilities increasingly are choosing online learning experiences. Research-based interventions need to be applied to online learning to keep these students engaged in school. Students find that eLearning is not without its challenges, and the most important one is not having a routine to follow. The only way to manage classes and motivate oneself is by staying organized. There is also an overwhelming workload, including homework and preparing for exams. There is widespread confusion over course requirements as well. (Rotas, 2020)

In this time of pandemic, video captions, also known as same-language subtitles, benefit everyone who watches videos (children, adolescents, college students, and adults). More than 100 empirical studies document that captioning a video improves comprehension of, attention to, and memory for the video. Captions are particularly beneficial for persons watching videos in their non-native language, for children and adults learning to read, and for persons who are D/deaf or hard of hearing. <https://www.washington.edu/doi/what-real-time-captioning>

Video aided real time captioning is technique that can improve children's reading skills (Linebarger, Piotrowski, & Greenwood, 2010), boost adolescents' written and spoken vocabulary (Davey & Parkhill, 2012), increase college students' attention to lectures (Steinfeld, 1998), enhance second-language learners' pronunciation (Mitterer & McQueen, 2009), and raise literacy rates in developing countries (Kothari, Takeda, Joshi, & Pandey, 2002). The technique is simple: Display captions on videos.

Even for hearing children, learning to read is a complex process, which requires learning to map sound and meaning onto text (Linebarger, 2001). Soon after captions began appearing on TV shows for D/deaf audiences, educators of hearing children made a striking discovery: Because captions explicitly illustrate the mapping among sound,

meaning, and text, captions could also benefit hearing children learning to read (Adler, 1985; Kirkland, Byrom, MacDougall, & Corcoran, 1995; Koskinen, Wilson, & Jensema, 1986; Parkhill, Johnson, & Bates, 2011).

In response, the D/deaf community created captions (Downey, 2010), first by recapitulating the intertitles of the silent film era and then by reconfiguring the bottom-of-the-screen foreign-language subtitles that carried U.S. films across the world. In the late 1950s, U.S. President Eisenhower authorized a federal Captioned Films for the Deaf agency (as “part of the post-Sputnik, cold war education boom,” Downey, 2008).

After watching each type of video (or listening to only the audio) twice, in counter-balanced order, the students recalled as much content as they could using either Japanese and English. The students recalled substantially more content after they watched the videos with English captions than after they watched the same videos with Japanese captions. In fact, after watching the videos with Japanese captions, the students recalled as little as they recalled after not even watching the videos (the audio only condition).

However, as recent litigation (Orzeck, 2015) as well as empirical data (Pan, Jiang, Yao, Picheny, & Qin, 2010) demonstrate, captions generated via automated speech recognition are not yet without interfering error. When auto-generated captions reach parity with human-transcribed captions, further technologies, including real-time captioning of lectures for all students (Bain, Basson, Faisman, & Kanevsky, 2005), will be able to harness the power of captions for the broadest population ever.

Deaf students cannot benefit from video conference classes without translators. It is difficult for instructors to provide live captions when lecturing during distance learning classes. While deaf people develop good attention skills, they can also be easily distracted (Pappas et al., 2018). Thus, instructors should take care not to confuse or overload learners when planning for VCs (Kear et al., 2012). Because sign language requires more memory capacity than spoken language, deaf people have shown indications of having a weaker memory than hearing people. Easy-to-follow, short learning modules can help alleviate this problem (Pappas et al., 2018). Finally, synchronous e-learning is unpredictable because teachers need to adjust their approaches to address the learners’ responses and meet their needs (Kear et al., 2012).

With this scenario, video assisted real time captioning has been the adapted technique to classroom use so that people who rely on text to communicate have instant access to the spoken word. A professional captioner sits with equipment to enter what is spoken and presents it on a computer monitor for the student. Sometimes these services include note taking; the student is given an electronic version of the presentation or group discussion. These systems are particularly useful for students who do not effectively follow content aurally but for whom reading printed English is a strength.

Research Questions:

1. What is the performance of the learners before and after the use of video-aided real time captioning technique in remote learning?
2. Is there a significant difference in the learner’s performance after the use of video-aided real time captioning technique in remote learning?

Scope and Limitation

This study was conducted in Dapa National High School school year 2021-2022. It will focus on the Learners with Special education needs students of Grade 9 in learning science concepts. The participants were selected purposely preferably the Hearing Impaired Students. First, the two students used modular distance learning-printed modules afterwards modules will be checked and recorded. Meanwhile, the 2 students used the video-assisted real timecaptioning delivery of learning. The findings of the study were limited only in the above mentioned participants.

Research Methodology:-

Sampling

The participants of the study were the bonafidestudents and presently enrolled in Dapa National High School. The participants will be selected purposely specially those students who are considered learners with special needs such as Hearing Impaired and Visually Impaired. A total of 4 students will be included in the study from Grade 9.

The study determined the performance of the participants before and after the use of video-assisted real time captioning technique to cater the learning needs of the students. The assessment scores reserved as primary data to assess the students' progress of learning in science subject.

Data Gathering Procedure

The researcher wrote a transmittal letter to the School Principal to gain approval to the conduct of the research study. A letter of consent was sent to the parents to allow the researcher to communicate directly to collect data and conduct remote learning with their guidance and assistance. The data were retrieved, checked, tabulated, analyzed and interpreted with the use of statistical tools.

Research Instruments and Validation

To obtain the validity and reliability of the results of the study, appropriate statistical tools will be used.

The following statistical tools used in the study. To determine the level of performance of the students' was mean percentage score. The mean percentage score is the quotient of the raw score and the total number of points times 100%.

T-test used to determine the significant difference between the performance of the students in controlled and experimental group based on their Post-test.

Hypothesis:

Ho: There is no significant difference between the performance of the students in controlled and experimental group based on their Post-test.

Ethical Issues

To ensure the protection of the data, the researcher took some consideration in analyzing the data. These are the following: (1) all answers were based on the stock knowledge of the participants; (2) Furthermore, the researcher ensures the data collected were used for the research purpose only. No part of this research shall be released nor published without prior permission from the researcher

Discussion Of Results:-

This part presents and discusses the findings and conclusions of the study based on the guide questions posted in part III of the research.

Findings

This part presents the substantial effect of video-aided real time captioning in terms of their performance in an assessment. The students' performance on the different type of test were determined using mean percentage score (MPS).

Table 1:- Performance of control and experimental group during pre-test.

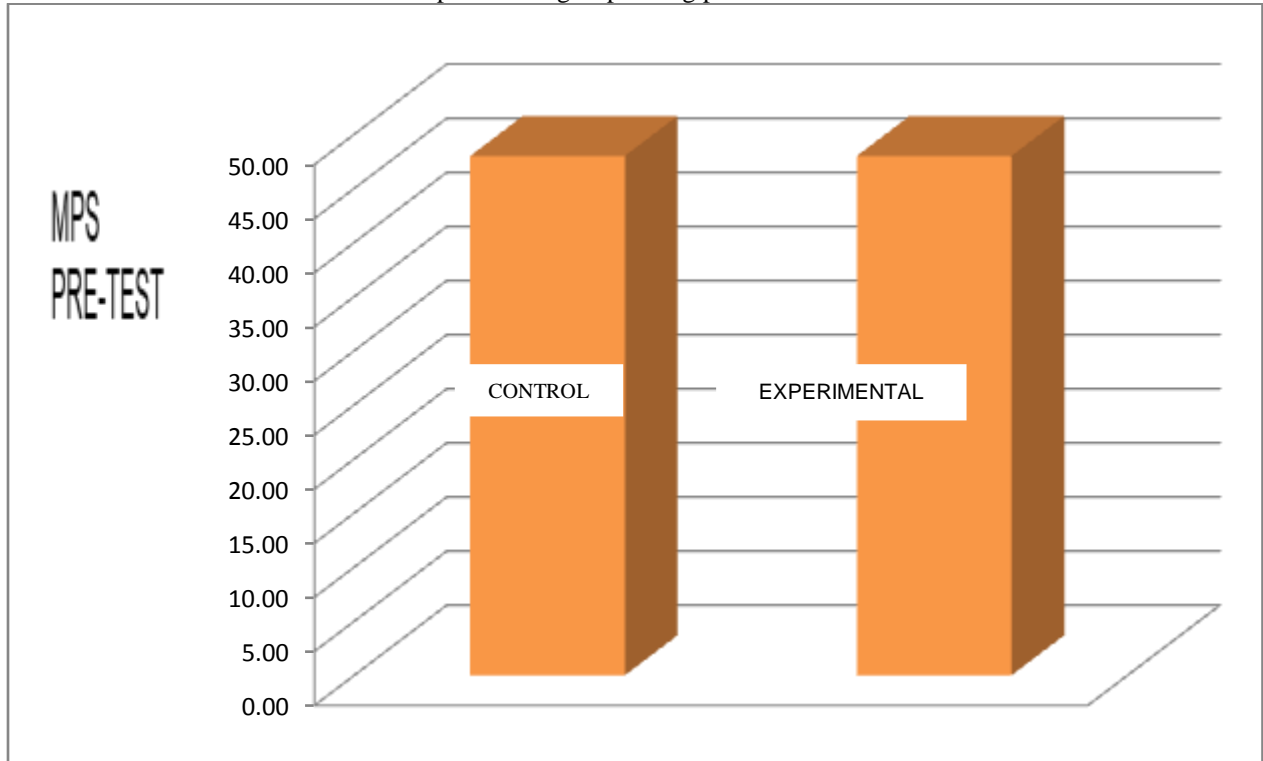


Table 1:- showed the performance of the students in control and experimental group in pre-test. The same group of students were utilized as participants of the study. It can be gleaned that the control group obtained the mean percentage score of 48 and the experimental group garnered 48. It means that pre-test results have the same mean percentage score. It clearly suggests that, modular distance learning-printed activities were given to the two groups has no effect in their academic performance. These challenges are magnified when teaching students with disabilities. Instructors often inadvertently erect barriers for these students, including the need for technical skills and knowledge; moreover, hard-to-navigate educational web sites can also create problems. Intrapersonal barriers related to students’ specific disabilities can arise and while assistive technology devices help disabled students, not all access barriers have been removed (Tandy & Meacham, 2009).

Table 2:- Performance of control and experimental group during post-test

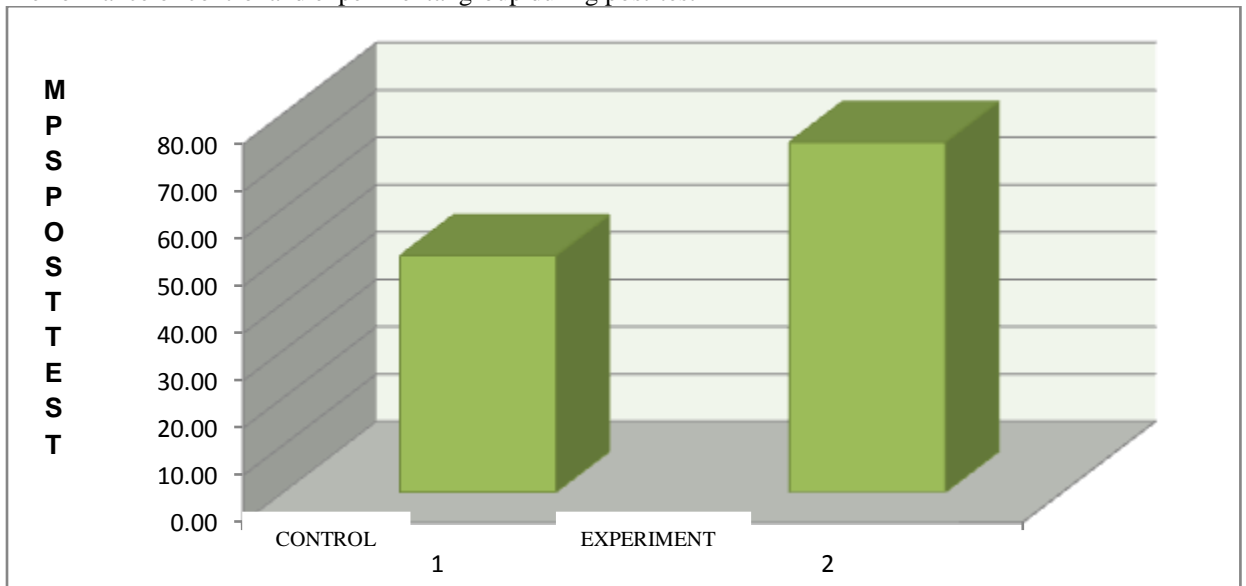


Table 2:- displays the performance of the students in control and experimental group in post-test. The same group of students were utilized as participants of the study. It displayed that the control group obtained the mean percentage score of 50 and the experimental group garnered 74. It means that post test results have the different mean percentage score. It clearly suggests that, the use of video aided real time captioning as intervention to simply understand the topic. Captions, composed of text, are used by people who are deaf or hard of hearing to access content delivered by spoken words and sounds. Real-time captions, or Computer Assisted Real-time Translation (CART), are created as an event takes place. Captions can also benefit individuals who understand the written better than the spoken word of the language in which a presentation is delivered as well as people who are viewing the program in a noisy (e.g., airport or sports bar) or noiseless (e.g., a work cubicle) environment. Captions that are not "real-time" include those provided on television programming and those made available on prerecorded video that can be rented or purchased. <https://www.washington.edu/doi/what-real-time-captioning>

Live remote captioning allows listeners who are deaf or hard of hearing to access captions of speech in real time. It is the preferred for situations where 99% - 100% accuracy is required. <https://www.unimelb.edu.au/accessibility/video-conferencing-for-hearing-impaired-staff/live-remote-captioning>

The idea of a real-time voice-to-text translation device for the deaf is not a new one (Gates, 1971; Houde, 1979; McCoy and Shumway, 1979; Stuckless, 1981; Block and Okrand, 1983; and Cutler, 1990). Stuckless (1981, p.292) refers to the concept as the "computerized near-instant conversion of spoken English into readable print." He also describes the possibility of using real-time captioning in the classroom. Furthermore, he points out that text displays of this type are not bound by the same temporal characteristics as speech since there can be a visual buffer of some sort (akin to "instant replay").

Table 3:- Significant Difference between the performance of the students' in control and experimental group during Pre-test.

PRE-TEST	Paired Differences					t	df	p-value	Decision
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Control vs Experimental	-.15000	.67082	.15000	-.46395	.16395	-1.000	19	.330	Accept Ho

Table 3 :-displayed the significant difference between the performance of the students' in control and experimental group during Pre-test. The two underlying variables have no significant relationship considering a p – value of 0.330 which is greater than the $\alpha = 0.05$ leading to the acceptance of the null hypothesis. Therefore, there is no significant difference between the performances of the participants during pretest.. People around the world have had to adapt to distance learning due to COVID-19. The pandemic has closed conventional classrooms for more than 300 million students who are now distance learning from their homes. Students differ in terms of their cultures, age, gender, and cognitive and technology skills and needs. Moreover, deaf and hard-of-hearing students use a special language for their interactions, which can be challenging in a distance learning environment. (Alsadoon, 2020)

Table 4:- Significant Difference between the performance of the students' in control and experimental group during Post-test

POST TEST	Paired Differences					t	df	p-value	Decision
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Control vs Experimental	-.65000	.48936	.10942	-.87903	-.42097	-5.940	19	.000	Reject Ho

It can be gleaned from the table above the significant difference between the performance of the students' in control and experimental group during Post-test. The two underlying variables have a significant relationship considering a p – value of 0.000 which is lower than the $\alpha = 0.05$ leading to the acceptance of the null hypothesis.

The wide array of high-speed internet technology enables institutions to provide students with synchronous learning experiences in VCs. Synchronous communication enhances students' sense of social presence; moreover, it is convenient and it supports a variety of communication modes, such as audio, video, text, presentations, and shared whiteboards, which facilitate real-time online learning and teaching activities (Kear, Chetwynd, Williams, & Donelan, 2012). However, changes in education technology have created further challenges, particularly in distance learning (Tandy & Meacham, 2009).

Technology skills have become increasingly necessary for everyone, regardless of age, gender, culture, health, or individual disabilities, and they are especially crucial for deaf and hard-of-hearing students (Debevc, Kosec, & Holzinger, 2011). These skills help them communicate with their instructors and their peers. Students with disabilities spend less time interacting with their teachers than their able-bodied peers, and they have different learning experiences; thus, it is not surprising that they make less academic progress than their peers (Webster & Blatchford, 2019).

VART helps make your event, speech, courtroom, classroom, workshop, seminar, church service, or meeting compliant with the Americans with Disabilities Act (ADA) and accessible to people who have a hearing loss. Hearing accessible technology and services are crucial to creating an inclusive event so that everyone can participate, regardless of how well they hear. When possible, an audio component should be considered as well: hearing assistive technology such as induction loops, FM, and infrared systems combined with VART provide the highest level of accessibility. (Hearing Loss America, 2022 <https://www.hearingloss.org/hearing-help/technology/cartcaptioning/>)

Conclusions:-

The pre-test and post-test performance of students exposed to video aided real time captioning as remote learning for hearing impaired students is much higher than the exposed to modular distance learning activity in learning Circulatory and Respiratory System. Thus, the students exposed to the applications Video Aided Real Time Captioning has a definite learning and provided them with the lifelong learning despite the threat of the pandemic.

Recommendations:-

It is recommended that the inclusion of video aided real time captions should be adopted by all subject areas especially in the four sides of the classroom which dramatically increases a deaf or hard of hearing person's ability to comprehend the speaker. In addition, providing captions to hearing people also seems to enhance verbal comprehension. The gradual increase in comprehension for both hearing and deaf students will likely lead to a better learning environment, thus, it improved information transfer between the teacher and the students.

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