



(RESEARCH ARTICLE)



Project CALM (Count And Learn Mathematics): Effects of Computer-Aided Instruction on Basic Counting Skills of Non- Graded Learners with Special Education Needs (LSEs)

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Abstract

This study aimed to determine the effect of Project CALM (Count And Learn Mathematics) in using computer-aided instruction in improving the basic counting skills of 15 non-graded Learners with Special Education Needs (LSEs) in Guronasyon Foundation Incorporated National High School during the school year 2022–2023 who are selected through purposive sampling. Parameters were based on pretest and posttest. The researchers used the experimental descriptive design thus, applying different statistical treatment such as mean, standard deviation and dependent t- test.

Findings depicted that the overall mean results for pretest and posttest for the basic counting skills are 3.17 and 8.10 with Fairly Satisfactory and Very Satisfactory verbal interpretations. In addition, the dependent t-test results revealed that the level of performance in basic counting skills of respondents after the exposure to Project CALM thru utilization of computer- aided instruction differ significantly since the p-value is less than 0.05. With such results, the null hypothesis is rejected with verbal interpretation of significant.

To conclude, data proved that there is an improvement in the basic counting skills of LSEs as shown on their performance before and after the exposure to Project CALM (Count And Learn Mathematics) based on the data gathered. With the diligence of using computer-aided instruction under this project, it is claimed that the strategy is effective considering the higher mean score of posttest than the pretest.

Summing up, LSEs were able to enhance and broaden their basic counting skills as result to the strategies offered by the teachers and teacher-volunteers using computer-aided instruction. This could possibly be the result of tailor-made and engaging activities provided among LSEs throughout the course of this project. However, continuous effort and discovery of new and relevant learning strategies and techniques should be done to ensure further enhancement of LSEs skills in basic counting.

Keywords: Computer- aided instruction; Basic counting skills; Inclusive education; CALM

1. Introduction

In most aspects of our life, including the classroom, technology plays a central role, and this is not an exception. Students, whether they are in kindergarten, in high school or those with special educational needs, have grown up in a society that is increasingly dominated by technology.

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Relatively, based on GCU (2020), technology enables students to participate in the classroom in ways they never have before. Many special education kids may benefit from technology that enables them to write, spell, read, and do mathematical computations. Word processors can alert kids to spelling errors. Adaptive readers highlight material or read aloud to pupils so that they may study and utilize websites in the same way that their classmates do. Students who get special education and utilize a laptop for assistance will not stand out or seem out of place as technology becomes more popular in classrooms.

Similarly, UNESCO (2006) through Education for All movement (EFA) provides Learners with Special Educational Needs (LSENs) the equal chance in teaching and learning process. Whereas specialized training courses on ICTs in Education for Individuals with Special Needs give experts participating in the education of people with SEN an understanding of the concepts, approaches, and methodologies, taking into consideration ICT diversity in all areas of education.

Though achieving the right to education for persons with disabilities in basic education is a challenging task, the Department of Education continuously improves itself especially for the benefit of its no.1 clientele, the learners. With its commitment to give quality educational services to children with special needs, DepEd, as anchored in DO 50, s. 2010 – Strengthening Special Education Program at the Basic Education Level it states that:

“The Special Education Program (SPED) is necessary to provide equitable access to basic education by learners with exceptionalities.”

However, understanding the most recent EdTech trends and how these tools function is crucial for educators and EdTech firms seeking to deliver the finest learning solutions for children with disabilities. Dikumar (2018) cited that LSENs learn in different ways. With that, teachers may need to assist students not just with course content and educate pupils at varying paces, but also physically if they have mobility disabilities or other physical restrictions. Their demands are different, hence with appropriate tools and enough care, they will flourish, and it will allow them to study at their own pace.

As the researcher herself is an inclusive education advocate, she believes that children with disabilities should be given the opportunity to reach their full potential. They should be able to engage in learning experiences with the same terms as normal students and should be subject to bias and prejudice, this is in accordance to the findings of Tiraña, Cruz, Guinto (2022) who also claimed that the use of technology in Special Education teaching has a favorable impact on their motivation, attitudes, success, and peer relationships in the classroom. As a result, technology has the potential to improve children's educational, social, and cultural experiences.

Technology has opened numerous educational avenues for children, especially for disabled children. Alternative technological solutions accommodate physical, sensory, or cognitive disabilities in a variety of ways.

Marcino (2018) cited that students who are enrolled in special education can benefit from the use of technology in addition to those who are enrolled in regular education because it gives these students opportunities for socializing and learning that were previously unavailable to them due to the physical or mental impairments they have. It is essential for the learning process to provide learners with a variety of resources in order to consolidate their acquired information and make it more long-lasting.

Therefore, those who have special educational requirements should have varied developmental characteristics; diverse equipment and resources should be supplied to fulfill the differing demands of these children (Stevie, 2018). Those who do not have special educational needs should have the same developmental characteristics. Learning environments may be made more engaging by making use of a variety of resources and methods that have been organized to cater to the distinctive requirements of each individual learner.

With that, GFINHS, the research locale, through the proponent introduced Project CALM. It is an initiative of the school, GFINHS Special Programs and Inclusive Education, which will expose LSENs in computer-aided instruction in teaching. To add, it is an approach in teaching and learning Mathematics with the utilization of computers and any technology-enhanced equipment to supplement improved learning experience and spark engagement among learners. With that, it will be used as an aid to the presentation, reinforcement, and assessment of material to be learned, usually including a substantial interactive element. It will present itself as a capable and consistent partner to both teacher and student that will revolutionize how Mathematics will be taught for the LSENs. Practice opportunities, self-correction and fast corrective feedback, teacher-directed training, and consequences for increasing student motivation and engagement were all important instructional components of this strategy.

As an example, students who are having a hard time writing can use speech to text application, screen readers or voice command technologies. Hence, students with Low IQ or LSEs who have difficulties in applying knowledge can use interactive or gamified learning instructions for them to be more engaged in learning. This suggests that understanding each student's particular requirements and what they need the most assistance with will be the goal of Project CALM and the use of computer-aided instruction in teaching Mathematics for LSEN. Having great hope, this endeavor may help teachers to obtain a better grasp of how sorts of technology-based instruction can be useful to supplement the differentiated needs of learners and by embracing it they may discover educational alternatives to assist students in making life-long learners.

With great hope, through Project CALM and the use of computer-aided instruction for LSEs it could offer teachers a variety of techniques and strategies to motivate them to study Mathematics specifically to be well-versed in basic counting skills. It will open an opportunity for LSEs to improve more and experience the benefits of technology at hand.

Moreover, this research has the potential to give further information on the use of technological tools in the instructional process of students who have learning difficulties. This article may serve as a guidance for teachers and teacher-volunteers on how to teach LSEs basic counting skills in a manner that is more relevant and engaging. In addition to this, it will make them aware of the requirements and challenges that are faced by both teachers and learners, and they will be able to handle issues in order to make the learners' education more fun and useful.

With regards to it, the proponent would like to give emphasis on the effects of Project CALM (Count And Learn Mathematics) in using computer-aided instruction in improving the basic counting skills of 15 non-graded Learners with Special Education Needs (LSEs) in Guronasyon Foundation Incorporated National High School during the school year 2022–2023. Perhaps through this, LSEs will be more engaged on learning Mathematics and may enhance their skills in counting.

2. Material and methods

2.1. Methods

This research attempted to examine before and after the exposure to Project CALM which utilized computer-aided instruction on basic counting skills of non-graded Learners with Special Education Needs (LSEs) at Guronasyon Foundation Incorporated National High School. Pretest and posttest data served as the basis for parameter estimation.

The experimental descriptive research method was used by the proponent of the study. Participants were 15 students who had been clinically determined to be learners having specific learning difficulties. They have been recognized as learners who are struggling with certain forms of learning and are unable to keep up with the academic rigor that is present in conventional classroom settings. Respondents were given access to computer-aided learning in order to enhance their fundamental counting abilities. This was done since they need a great deal of support to improve their performance.

Respondent's performance on the pretest and posttest was evaluated before and after they had been exposed to computer-aided learning strategy. This is to determine how much impact it has had on their current level of performance.

Table 1 Range of Level of Performance in Basic Counting

Level of Performance in Basic Counting	
Test Score	Verbal interpretation
9.00 – 10.00	Outstanding
7.00 – 8.00	Very Satisfactory
5.00 – 6.00	Satisfactory
3.00 - 4.00	Fairly Satisfactory
0.00 -2.99	Needs Improvement

The results of the pretest and posttest were the primary source of data. It was analyzed to assess whether or not there was a statistically significant improvement in the level of basic counting skills among non-graded learners who had special education needs (LSEs). Thus, pre-test was provided before exposure, while the post-test was administered after exposure to computer-aided learning. Activities relating to the basic counting skills were included in the exams.

In terms of basic counting skills scores from pretest and posttest were gauged using the following ranges.

3. Results

This part discusses the analysis, interpretation, and implications of the statistical results on the stated problems of the study.

Table 2 Level of Performance in Basic Counting Skills before and after the exposure to Project CALM as Revealed by the Pretest and Posttest Results

Test	Level of Performance in Basic Counting		
	Mean	Standard Deviation	VI
Pretest	3.17	0.65	FS
Posttest	8.10	0.92	VS

The table depicts that the overall mean results for pretest and posttest for the basic counting skills of LSEs are 3.17 and 8.10 with Fairly Satisfactory and Very Satisfactory verbal interpretations. This implied that there was an increase in the basic counting skills of LSEs before and after the exposure to Project CALM.

Relatively, findings show that through the strategies used by Project CALM which is computer-aided instruction in teaching Mathematics provided by the teachers and teacher-volunteer, LSEs were able to improve and expand their skills when it comes to counting. This may also be the result of the lively and engaging activities given to them through the course of their study.

To add, this can be related to Kazmi (2022) who suggested that there is little doubt that integrating technology into classrooms for special education will result in positive outcomes. Furthermore, Tiraña (2022) stated that students are able to study at their own speed with the assistance of these educational technology tools, which also cater to the specific requirements of each individual student. Educators, on the other hand, need to have an understanding of the kinds of tools that their students will need in order for EdTech to be able to give the appropriate answers to pupils.

Table 3 Significant Difference on the Level of Performance in Basic Counting Skills before and after the exposure to Project CALM as Revealed by the Pretest and Posttest Results

Test	Level of Performance in Basic Counting		df	p- value	HO	VI
	Mean	SD				
Pretest	3.17	0.65	9	0.00	Rejected	Significant
Posttest	8.10	0.92				

As reflected on the table, the dependent t-test results revealed that the level of performance in basic counting skills of respondents after the exposure to computer-aided instruction differ significantly since the p-value is less than 0.05. With such results, the null hypothesis is rejected with verbal interpretation of significant.

The findings showed that Project CALM through its strategy in using computer-aided instruction in teaching Mathematics helps in improving the level of performance in basic counting skills of students, specifically the non- graded learners with special educational needs of Guronasyon Foundation Inc. National High School. Further, the strategy given was able to make it simple for teachers to provide students specifically tailored educational experiences with assistive technology capabilities that led in producing lessons and activities suitable for LSEs.

In light, Smith (2020) also shared that the effect that technology has had on almost every facet of contemporary life has been, on the whole, positive. The use of technology in special education is one area where this point is perhaps made clearer than in any other. Teachers in special education may use educational technology to provide students with accessible, individualized learning experiences that are particularly suited to meet the requirements of each student. This indicates that LSEs enrolled in special education programs have the opportunity to discover the joys of learning and the satisfaction that comes from accomplishing goals making them fruitful learners.

4. Discussion

Based on the findings of this study, it is safe to say that there is a greater mean score on the posttest than the pretest. Also, significant difference exists between the pretest and the posttest. This only proved that there is an improvement in the basic counting skills of LSEs as shown on their performance before and after the exposure to Project CALM which made use of computer-aided instruction in teaching Mathematics as based on the data gathered.

Similarly, through the use of computer-aided instruction under Project CALM, is effective considering the higher mean score of posttest than the pretest. However, continuous effort and discovery of new and relevant learning strategies and techniques should be done to ensure further enhancement of LSEs skills in basic counting.

Based on the foregoing findings of the study, it is hereby recommend that school heads and administrators should spearhead programs that may increase learning for all students by incorporating technology into the classroom, which may assist to break down barriers in the curriculum. Both students and teachers tend to benefit from it, hence, encouragement and assistance with the implementation of computer-assisted learning should be given.

For teachers, it is essential to devise innovative, participatory, and enjoyable modes of instruction, in particular for students who have exceptional educational needs. Experiences of learning that are both engaging and thorough, as well as effective, play an essential part in the development of learners' competency. It is necessary to adjust and find relevant, contextualized, and localized teaching methods in light of the rapid advancement of technology in the context of the educational process.

Applications for computer-aided learning keep students interested and offer them with excellent learning opportunities; hence, teachers need to be knowledgeable in the use of this to improve students' academic performance.

As future researchers, additional study on the advantages it offers could be helpful in order to generate findings that the educational system might put into practice and students might profit from.

5. Conclusion

Findings of this study showed that LSEs were able to improve and expand their basic counting skills through the strategies used in Project CALM. The computer-aided instruction used by teachers and teacher-volunteers in teaching Mathematics helped to increase the level of their performance of non-graded LSEs which could be the result of fun and engaging activities offered to them during the course of this activity.

Having positive outlook, the researcher hoped that through Project CALM and the use of computer-aided instructions in teaching LSEs could help in discovering innovative strategies and techniques to motivate them in studying Mathematics specifically to be well-versed not only basic counting skills but to other mathematical competencies that they may need in their academic and personal life.

Compliance with ethical standards

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Statement of informed consent

Participants know the purpose, benefits, and risks behind the study before they agree or decline to join. Hence, to protect their privacy, information about them is hidden.

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