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Data Analysis Integration Computer Imported Learning: A Microsoft Excel Case with Statistics

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Abstract

The use of ICT in teaching and studying mathematics helps students to develop mathematics. The practice's application, therefore, depends on different considerations, amongst which: teachers' expectations of their ICT teaching skills, instructor attitudes towards teachers in mathematics, teacher attitudes towards ICT contributions to student mathematics awareness. The research was undertaken to assess ICT integration readiness in the classroom in the Paracelis district for mathematics teachers at secondary schools. The thesis used a questionnaire with comments on any of the above variables. This questionnaire was forwarded to 15 mathematics teachers at Paracelis District secondary schools. It shows that ICT teachers' intervention in mathematics has an average limit of 4.06. It also ensures that mathematics teachers are confident and willing to use ICT in mathematics and mathematics instruction. The research results indicated that the controls and the sample groups were substantially different and verified. It shows that the research group was higher than the test group. The use of Microsoft Excel in integrating machine data in the resolution of statistics positively affects the student's performance. The integration of ICT into teaching, therefore, has an advantageous effect on the progress of students.

Keywords: Computer Integration, Microsoft Excel, Statistics

INTRODUCTION

Today, the 21st century relies on machines and robotics to carry out statistical analyses. The decision-making processes are vital for the machine when reviewing mathematical records utilizing software packages. No uncertainties exist with software packages concerning programming obligations, and managers today depend on which mathematical approach is acceptable and how outcomes should be interpreted.

Computers are doing a better job of creating graphs, maps, and execute computational calculations regardless of data precision. We ought to think about two things while we use machines in statistics. It obeys the guidelines as to if the operation is valid and suits the data design. The machine cannot invoice the nature of the data with an unsuitable exam. The customer is liable for asking for the correct mathematical procedure, not the machine [1].

Technology may improve the effectiveness of teaching. They enhance quality teaching, promote the learning process, encourage constructive learning by students in terms of involvement and input at their own speed and provide students the psychological rewards they need to work hard [2].

Statistics is one of the subjects in Senior High School that learners need to master. It involves collecting, presenting, and implementing data gathered through a direct or indirect method to solve a problem [3]. These skills are essential for learners to manifest because they are prerequisites in undergoing a higher form of inquiry as they go on with their study. Likewise, the Grade 11 students of Butigue National High School had difficulty solving problems involving statistics.

The proponent wants to integrate computers through Microsoft Excel to encourage learners that solving Statistics offers a broad understanding of the lesson. The CIDA is a Computer Integration of Data Analysis (CIDA) in using Microsoft Excel. For example, the following are the spelling scores of 10 male and 10 female students. Test the null hypothesis that there is no significant difference between males' and females' performance in HUMSS students in spelling. Use the t-test at a 0.05 level of significance. The student will enter the data in Microsoft Excel.

The CIDA is Computer Integration of Data Analysis using Microsoft Excel to aid the students in their solving ability. After the lecture and discussion on the subject matter, the students will apply the data analysis by opening their Microsoft Excel.

The purpose of the CIDA technique's exposure is to enhance students' enthusiasm to love numbers and enjoy solving. It also allowed students to function alone or as a community to seek solutions to their concerns. As a consequence of data processing, higher-order abilities are developed, and students can only make decisions. It also provides the students with opportunities to apply what they have learned to other subjects and other learning areas.

As experienced and observed at Butigue National High School, solving skills is difficult for students when done manually. Students refuse to finish their tasks due to their inability to solve problems involved in their studies. But with the use of technology, problem-solving would be easier. Thinking critically and successfully solving mathematical problems are skills that evolve in the course of learning mathematics in a school context and everyday life. Using spreadsheet software to demonstrate and practice mathematical skills is likely to help teachers and students develop them.

The following researchers support this. In the research [4] mentioned, students gain a sense of pride when they complete authentic work that shows their perceptions and newly found knowledge. Students are more likely to take ownership of their learning and create a portfolio of their learning experiences when given the freedom to use various technologies. According to [5], however, the results' review did not show any substantial difference between the two modes of guidance in the dissertation entitled "The Impact of a machine aided instruction on the student achievement." The students' awareness surveys showed that the feelings towards computer assistance did not change significantly (CAI).

The study [6] also accepted that enhanced commitment to students as technology is used. Yet they find that children who receive machines are more likely to have a social network account, but they often spend more time communicating with peers themselves. There are no casual impacts on school results and only minor beneficial benefits to children's social welfare.

Similarly, [7] has shown that students are increasingly able to solve problems—the possibility of solving problems from 68% to 96% by video games. However, the One Laptop per Child Program conducted in Peru is examined according to [8]. The initiative contributed to a significant rise in the use of computers both at home and at college. In conclusion, neither mathematics nor language courses has a substantial impact on testing. However, there is no effect on the academic abilities of pupils.

Likewise, [9] concluded that the one-to-one laptop program for 4th and 5th grades in California school district. After two years, the students who received laptops perform better than the non-laptop students in English language arts and tests measuring writing strategies and literacy response and analysis. Yet, the study revealed that the effects of government upgrades in ICT, by increasing the connection speeds, on children's performance in England. They found out that it has a zero impact on students' educational attainment or learning productivity.

Similarly, [10] has reported that often shy or more uninhibited students sometimes use technology to become more active since they see it as more non-threatening. Nevertheless, research has shown that the usage of individual laptops in high schools has little impact on academic achievement.

Technology will enhance student participation and thereby influence intellectual comprehension and academic performance overall [11]. However, in Molly Knack's study on computer-based education and its impact on learners in the 21st century, there was no substantial change in statistics in algebra students who use the Orchard app. According to [12], both teachers and learners realized that e-learning enables students to become acquainted with their own learning, provides diversification activities, stimulates intrinsic impetus for learning, and allows introverted students to engage.

Some studies have established a positive relationship between educational technology and student mathematics [13]. Their results indicate that students who have computers in their homes and schools appear to do well and have a significant beneficial association with students using computers at home and their mathematics performance. In contrast, several researchers find negative links between these variables [14]

TMSS 2011 data examined to examine the association between machine usage and student scores in Taiwan, Singapore, and Finland. The authors observed that students in Taiwan continued to have lower mathematical ratios if they used computers at home and school.

Previous research is viewed as new determinants of academic performance since they affect student work at different levels and in different ways. Several authors have examined young people's use of technologies and the impact of some of these tools on their academic performance [15]. Likewise, according to [16] showed that both computers use and the type of activity engaged in contribute significantly to explain not only the academic performance in young people.

In contrast, other studies have found no relationship between academic performance and technology usage, and access to education, reporting no significant correlation between marks and the time students spend using technologies. It has also been reported that the use of technologies can affect student performance in one particular area but not in others. For example, it has been found that computer use in education does not significantly improve students' performance in mathematics but does so in science [17].

Similarly, [18], with greater thought and machine literacy abilities being more relevant, teaching students in conventional approaches do not fulfill learning requirements. Likewise, [19] in their research on developing the interactive learning media for school level mathematics through an open-ended approach supported by an Excel visual application. Research shows that students' creativity in interactive learning media is better than that of students with an expository method of Visual Basic Application for Excel and the creativity of students in interactive learning media is the combination of their knowledge of mathematics and the ability to learn.

Experimental research from various levels has shown that teaching mathematics with GeoGebra positively impacts student accomplishments on various mathematical topics compared with those received conventional guidance or treatments focused on the textbook. Similarly, the effect of teaching mathematics with GeoGebra on the intellectual perception of limit and consistency of talented high school students was studied. It was discovered that experimental community students receiving GeoGebra interventions had more significant results in the evaluation than those receiving conventional instructions in their mathematical skills [20].

Similar studies were done for pre-service mathematics teachers for the same subjects [21]. Concerning students' logical comprehension, experimental students who obtained GeoGebra training were superior to students receiving conventional instruction. Further, showed that the intellectual comprehension of first-degree students on the definitive integral was higher in the experimental community, which was primarily achieved with GeoGebra. Subsequently, GeoGebra examined the impact on students' roles in terms of logical and procedural information. When the experimental students consider their logical and procedural skills, there are slightly better results than those in the control sample [22]. In his research [23], he agreed on GeoGebra’s impact on students' logical and procedural skills: the case of the implementation of derivatives. These results showed that the use of derivation instruction of GeoGebra has a substantial effect on students' achievement regarding their logical skills.

In the study [24], all positive results from the use of statistical software were published. Similarly, the main facets of writing had promising results for fundamental ways of mathematical simulation of technology, both in terms of improving student levels and student satisfaction with the curriculum.

Results indicate that the use of MobyMax increased student success in contrast to Direst's traditional guidance in computer-assisted mathematics [25]. The results showed that this enhanced student performance. Similarly, [26] teachers using CAI had to find adequate ways of incorporating technology into a school to profit from the advantages. Computer helped learning could also be more effective than traditional teaching.

Conferring basic education and traditional teaching methods in the research of [27]. Computer-supported simulation and data analysis show that the students know all about the likelihood, sample size, and sample size implications via the intervention using simulations. With these related bases, the proponent wants to find the effect of CIDA in solving Statistics. The participants considered for this study are the 61 Grade 11 HUMSS students of Senior High School of Butigue National High School. They are composed of 30 males and 31 females enrolled in the school for S.Y. 2019-2020. The participants of the study are chosen will be using the CIDA technique. The students will be exposed to the CIDA technique to improve the solving ability of the students. The study, when completed, would be beneficial for the following: students, teachers, parents, Department of Education, and the community.

Conceptual Framework

In his thesis, [21] agreed on Geogebra's effect on student conceptual and procedural knowledge: the implementation of derivatives. From these results, it was apparent that teaching the Geogebra derivation application substantially impacted students' performance in conceptual understanding.

The findings show the usage of MobyMax in comparison to those who got standard Direst instruction in the seven-degree Mathematical Impact of Computer Assisted Instruction on Achievement. Like that, teachers using CAI had to find effective methods of integrating technologies into the classroom to get the advantage, and CAI could be more effective than conventional teaching.

Conferring to the study of [27] entitled Instruction and the Traditional Method of Teaching Basic Statistics, the care community's posttest performance is higher than the control group, then reversed in the posttest position.

Similarly, in [28], the survey's finding showed that the teachers' attitudes towards computers were all positive statements about computer attitudes, with most of the teachers considering ICT as a valuable tool for teaching and learning. The survey shows that most mathematics teachers have the confidence to integrate several ICT software in their education and learning, with most of the respondents being very confident in using PowerPoint. This is because attitudes play a fundamental role in integrating ICTs in the teachers' teaching practices.

According to [29], pupils are encouraged to benefit from ICT-based task automation and immediate reviews, using theoretical approaches and implementing mistake and trial methods. Students utilize computers to explore and grasp mathematical theories. The five most popular application packages used by mathematics teachers were word processing packages (71.1%), spreadsheets (51.2%), search engines (44.1%), presentation software (36.9%), and drill and practice software (24.3%). The five most popular application packages used by mathematics teachers were word processing packages (71.1%), spreadsheets (51.2%), search engines (44.1%), presentation software (36.9%), and drill and practice software (24.3%). The five most popular application packages used by mathematics teachers were word processing packages (71.1%), spreadsheets (51.2%), search engines (44.1%), presentation software (36.9%), and drill and practice software (24.3%). The Use of ICT in Mathematics Teaching found out that the five most popular application packages used by mathematics teachers were word processing packages, spreadsheets, search engines, presentation software, and drill and practice software.

Similarly, highly motivating mathematics teachers mostly seemed enthusiastic and optimistic in using ICT in high school mathematics. The results show, however, that supportive behaviors alone are not enough. This was seen in the analysis of [30]. Most teachers believed that technology would make students more inspired, love mathematics, gain more insight, and deal with challenges in the real world. The pupils are advised to use ICT's automation of assignments and immediate input, using conjecture and trial and error approaches. Students utilize computers to explore and grasp mathematical theories.

Paradigm of the Study

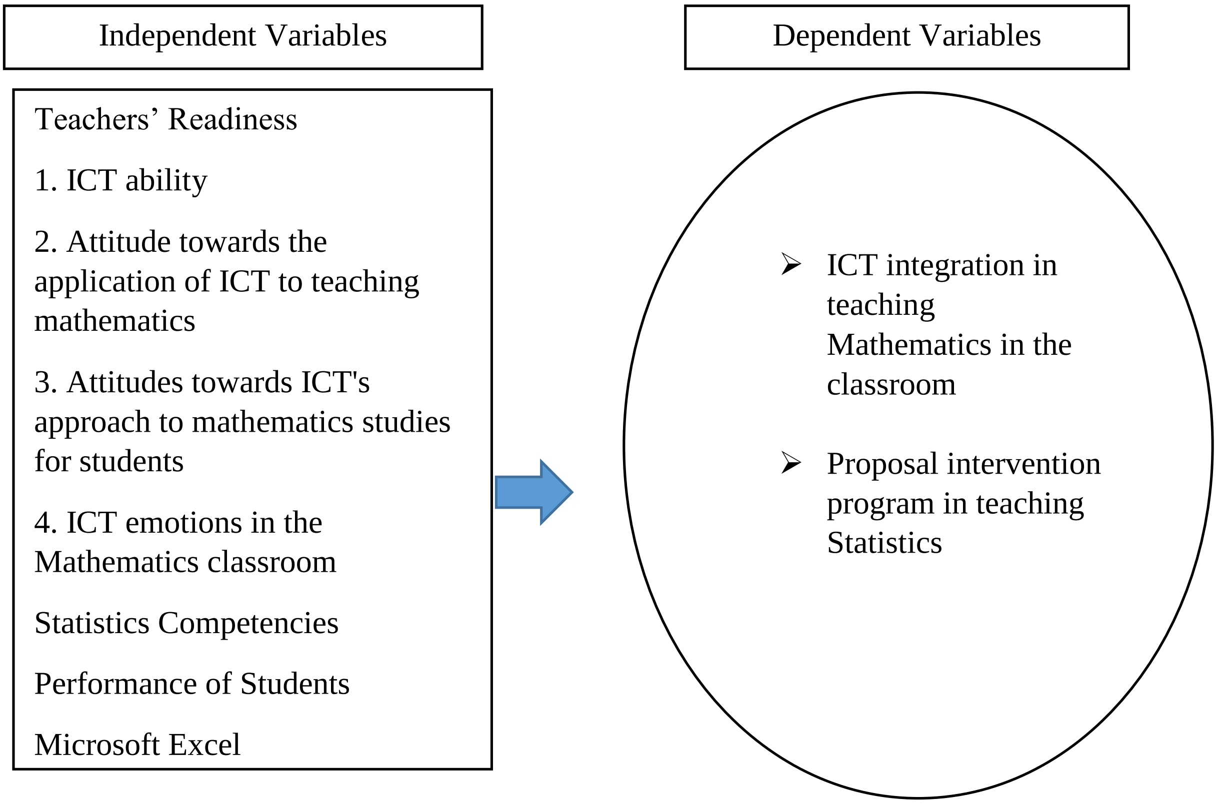

Figure 1. A diagrammatic representation of the Paradigm of the study.

The body's paradigm indicates that ICT incorporation in teaching Mathematics in the classroom is the dependent variable to assess the teachers' aim to integrate ICT in the classroom. These factors include expectations of ICT skills, ICT commitment to teaching mathematics, ICT contribution attitudes to Mathematics learning and feelings for ICT usage in the Mathematics Classroom, statistical expertise, student success, and Microsoft Excel, which are the independent variables.

Statement of the Problem

This research is mainly designed to analyze Microsoft Excel as a teaching and learning medium for 11-grade students at the national high school Butigue. This study also explored the different facets of Paracelis mountain province teachers' willingness to incorporate information and communication technology in mathematics teaching. Specifically, it answers the following questions:

1. What is the level of perceptions of Mathematics teachers as to:

   1.1. ICT ability;
   1.2. attitudes to ICT in the teaching of mathematics;
   1.3. attitudes to the application of ICT to the learning of mathematics students;
   1.4. ICT feelings in the classroom in mathematics;
   1.5. Self-Esteem and Control in the Presence of ICT in the Mathematics Classroom; and;
   1.6. intention to use ICT in the Mathematics Classroom?
2. What is the pretest performance of the control and experimental group of respondents?
3. What is the significant difference between the pretest performance of the control and experimental group of respondents?
4. What is the posttest performance of the control and experimental group respondents?

5. What is the significant difference in the posttest performance of the control and experimental group respondents?
6. What is the significant difference in the pre and posttest of the control and experimental groups of respondents?

METHODOLOGY

This chapter presents the research methodology of the study. It includes research method, research environment, respondents, data gathering tools, data gathering procedures, and statistical treatment of data. An experimental method was used in the study because it will be used two groups of respondents. The experimental method is used to establish a cause-effect relationship among various variables in a research study. The researcher made an effort to control for all variables except the one being manipulated.

[31] suggest that an experimental method is used when one condition is manipulated while the other conditions are not manipulated, and then differential effects of this condition variable are measured. Specifically, the researcher employed the one-group pretest-posttest design. Below is the representation of the design:

Pretest	Intervention	Posttest
O	X	O

As shown in the above design, a single and structured group of learners were under observation (O). Before applying the treatment or intervention (Microsoft Excel), careful measurement (pretest) was done. This was also done in the measurement after (posttest).

Test questions that cover the fourth quarter were used as the primary gathering tool of the data needed. The level of performance of students using and not using Computer Integration of Data Analysis was determined through posttest. The result will be analyzed using a t-test.

The study was conducted at Butigue National High School (BNHS). It is situated at Paracelis District, Mountain Province, Philippines. The study's respondents were the grade 11 learners with 61 and the 15 Secondary Mathematics teachers.

The researcher utilized the questionnaire as the main instrument for the data gathering for the teacher respondents. This was to survey if the teacher-respondents are ready to integrate ICT in teaching mathematics. The questionnaire was adapted from [38]. The researcher modified the questionnaire that applies to the teacher-respondents.

A 25-item teacher-made questionnaire, which covered all the fourth quarter competencies, was used for the student-respondents. These competencies were the basics of hypothesis testing, testing hypotheses about population mean, and testing hypotheses about proportion. The test questions were used to measure if there is a significant difference in Computer Integration of Data Analysis in teaching mathematics.

The reliability of the test questions was tested using the Kuder Richardson formula.

r KR20 = $\left(\frac{k}{k-1}\right)\left(1-\frac{\Sigma pq}{\sigma^2}\right)$. It is certified reliable based on the value r KR20 = 0.57, which means reasonable and acceptable.

The researcher sought the approval of the Schools Division Superintendent to carry out the research. Consequently, permission was sought from the schools in each school before administering the questionnaires to the concerned teachers. Further, informed consent was sought from the teacher-respondents before administering the questionnaires.

For the student-respondents, the proponent conducted the test and retrieved the answered test papers from the respondents. A teacher-made test was used to assess the students' mastery level on the lesson selected by the researcher. Participants are subject to the use of CIDA technology. A pretest was also offered before the lesson was introduced and a posttest after the course was completed. Both pretest and posttest before and after therapy are the same. And in each treatment, the researchers calculated and analyzed the results to evaluate if their mean variations in pretest and post-testing were meaningful.

A weighted mean was used to assess the teachers' readiness to incorporate ICT into mathematics teaching. A weighted mean is a procedure for combining the means of two or more groups of different sizes; it takes the groups' sizes into account when computing the overall mean or grand mean.

The research results and the control and test population were evaluated using a t-test. The t-test will help to determine if the variation between situations was true or was simply due to chance variations between tests.

RESULTS AND DISCUSSION

The research findings will give the output needed by the researcher to answer the research questions. The results of this study may be specific to the Secondary Mathematics teachers in Paracelis, Mountain Province. The findings focus on the level of the secondary mathematics teachers' perception in using ICT in teaching Mathematics and the significant difference between integrating ICT and non-integration of ICT teaching Mathematics.

Level of Perceptions of Mathematics Teachers

The degree of understanding of technology teachers in mathematics is positive. The mathematics instructors want to use ICT in daily activities. But teachers have ample time to learn and to provide ICT instruction and seminars. Via this preparation and workshop, teachers feel more secure and controlled with the classroom's computers. It also means that the addition of ICT to the lesson enables students to learn the task more quickly. This enthusiastic outlook shows that mathematics teachers know the beneficial effect ICT may have on student learning. Teachers in mathematics are prepared to incorporate ICT into a classroom in mathematics.

Perception of teachers of mathematics with ICT ability

The extent of expectations of mathematics teachers about their ability to use ICT in their lessons is positive. This is shown in Table 1.

It illustrates how teachers distribute their ICT skills. Most of the mathematics instructors believe that they are skilled in using ICT to teach mathematics, with an average ranking of 3.60. Most mathematics teachers think that they have the necessary productivity in teaching Mathematics to cope with ICT, with a median score of 3.53. Most mathematics teachers agree that the average score of 3.53 is not so challenging with ICT. It means that teachers of mathematics have the opportunity to integrate ICT in mathematics.

This conclusion is the same in the findings of the mathematics review [32]. The teacher's readiness to incorporate ICT into the classroom suggests that teachers can integrate ICT into the educational framework. Their desire to include ICT into their mathematics lessons is expressed not just in their awareness and attitudes towards technology integration in teaching and learning. The total mean is 3,38, and their ICT capabilities are neutral. This implies that the mathematics teachers have the intention to use ICT in everyday classroom practices but must be given teachers enough time to prepare their ICT-integrated lessons.

A large amount of ICT preparation courses is scheduled for teachers. Much of them were conducted in schools and aimed primarily at applying ICT instruments in education. There was a large amount of ICT preparation programs for teachers. Most of them were conducted at schools and focused mainly on using ICT tools in educational practice.

The findings are similar in [33] that teachers may not have time to successfully use CT in teaching and learning in several areas of their practice. This is the same with this study result since it provides teachers with adequate time to schedule their ICT integration lessons. This requires time to learn, exploration and pedagogy, insufficient time to cope with technological issues. [34] argued that the lack of time needed to achieve the pedagogical strategy is one of the principal cause's teachers don't use ICT in the classroom pedagogically. This is analogous to the results that mathematics teachers effectively interact with ICT at all stages, which gives them ample time to plan their teaching.

Table 1. Teachers' Perception of their ICT ability

Indicators	Mean	Qualitative Description
1. I have the productivity required in mathematics instruction to deal with ICT.	3.53	Agree
2. I have the know-how to use ICT in training in mathematics.	3.60	Agree
3. It is not that difficult to engage with ICT	3.53	Agree
4. It is convenient to engage with ICT in mathematics instruction	3.47	Agree
5. I can effectively communicate with ICT at all stages if I like.	3.33	Neutral
6. I have the potential to use ICT methods in different mathematical subjects.	2.87	Neutral
Overall Mean	**3.38**	**Neutral**

Level of Perceptions of Teachers Attitudes towards ICT contribution to Mathematics Teaching

The level of perceptions of teachers' attitudes towards ICT contribution to Mathematics teaching is a positive attitude in using ICT in education. They are aware of the importance of integrating ICT in the lesson.

Table 2 showed the behaviors of the teachers in mathematics towards ICT in mathematics. It reveals that most teachers of mathematics consent to use ICT as a constructive approach in mathematics instruction. The use of mathematics in teaching would not prevent the completion of the instructional content with a mean score of 3.67. Likewise, the high standard of ICT skills facilitates teaching mathematics by an average of 3.67. The use of ICT is critical for good mathematical teaching with a mean score of 3.47.

The finding is in line with previous [35] research since the results revealed that most mathematics teachers agree that they have a positive attitude in using ICT. It was revealed that the computer-based attitudes of teachers have been positive in most ICT professors.

The overall mean of 3.45 means agreeing with the positive attitudes Mathematics teacher-respondents have towards ICT contribution to Mathematics teaching.

It implies that integrating ICT in the lesson makes the students understand the lesson more and speeds up teaching simultaneously. This agrees with the research of [36] because the research findings revealed that integrating ICT in the lesson makes the students understand more the lesson at the same time it speeds up the process of teaching, and with the use of Excel might have positive effects on the affective domain of the students learning mathematics and the use of Excel might help the students enjoy the study of mathematics hence improve their ability to solve some practical questions.

Table 2. Teachers' attitudes towards the application of ICT to teaching mathematics

Indicators	Mean	Qualitative Description
1. I can get more math knowledge than books from the internet.	3.13	Neutral
2. The use of ICT is critical for effective mathematics instruction.	3.47	Agree
3. Using ICT in mathematics instruction speeds up the teaching method.	3.33	Neutral
4. The high standard of ICT expertise facilitates teaching mathematics.	3.67	Agree

5. The use of ICT in mathematics education should not prevent the completion of the instructional materials.	3.67	Agree
Overall mean	**3.45**	**Agree**

Level of Perceptions of Teachers' Attitude towards ICT contribution to Students' Mathematics Learning

The degree to which teachers recognize the importance of ICT to student mathematical learning is positive. Teachers demonstrate mathematical concepts for students in ICT application. Table 3 shows this.

Table 3 showed that teacher-respondent mathematics attitudes towards ICT contributions to student learning. It showed that most mathematics teachers believe that using ICT offers the students a good result. Using ICT in mathematics teaching improves understanding with an average score of 3.87. More ICT integration in mathematics teaching helps students with a median score of 3.80. Also, ICTs in mathematics show students with an average score of 3.60 mathematical principles.

The analysis demonstrates that most Mathematics Professors who use ICT in teaching mathematics demonstrate to researchers' mathematical principles that students use technology to identify mathematical ideas and grasp them in closer collaboration with research findings using ICT shows a strong result [32].

The cumulative mean is 3.61, which is optimistic in terms of the commitment of ICT to students' mathematical inclusion. This optimistic attitude indicates that mathematics teachers are conscious of the positive impact ICT may have on students' learning. Integration of ICT in mathematics instruction adds enthusiasm to the problem solving of the students. This result is parallel to the literature on the improvement in learning statistics called The function of technology. Following the results, mathematics instructors are numerous for the beneficial impact ICT may have on student learning [37]. Similarly, the results of the study showed that these optimistic behaviors reveal the positive impact ICT may have on student learning. Integration of ICT in mathematics instruction gives students enthusiasm for solving questions.

Table 3. ICT commitment attitude of teachers towards student mathematics learning

Indicators	Mean	Qualitative Description
1. ICT allows it easier for students to learn.	3.33	Neutral
2. The use of ICT in mathematics instruction improves comprehension.	3.87	Agree
3. Students profit from the usage of ICT in mathematical education.	3.80	Agree
4. The use of ICT in mathematics facilitates student self-learning.	3.47	Agree
5. The usage of ICT in mathematical education teaches pupils the values of mathematics.	3.60	Agree
Overall Mean	**3.61**	**Agree**

Level of Perceptions of Teachers' Emotion towards ICT in the Mathematics Classroom

The level of perceptions of teachers' emotion towards ICT in the Mathematics classroom is positive. Engaging in ICT does not scare them in presenting their lesson.

Table 4 explains the emotion of teachers in the Mathematics Classroom against ICT. As seen in the table above, most mathematics teachers have constructive feelings about using ICT in mathematics. Most respondents believe they felt good about the use of ICT in instruction. As if dealing with ICT, I don't fear the average score of 4.00, ICT also doesn't frustrate me with a medium score of 3.67, but ICT is also not upset with the average score of 3.60.

The research found that most of the respondents engaging with ICT were not scared of it, were not frustrated, and ICT does not make them feel angry. This is comparable in the study of [38] because the findings revealed that engaging in ICT does not scare, does not feel angry, and doesn't frustrate Mathematics teachers. Likewise, the analysis showed that the faculty has somewhat favorable attitudes towards ICT and respect for diversity while sharing the positive interactions with colleagues through which ICT is used, examine and focus on the activities of classrooms to increase success with such technologies.

It shows that the overall mean of 3.61 means that mathematics teachers have favorable emotions towards mathematics classrooms. They will use ICT in teaching with the provision of ICT training and workshops. This finding is related to the results of [39] that ICT helps to improve classroom management as students are well-behaved and more focused; however, teachers have some knowledge about internet use in teaching and learning, teacher's knowledge about ICT is very limited, which was also revealed in the research that provision of training and workshops for teachers are necessary. This research suggests that mathematics teachers will use ICT to provide training and workshops for teachers.

Table 4. Teachers' Emotion towards ICT in the Mathematics Classroom

Indicators	Mean	Qualitative Description
1. It is fun to interact with ICT.	3.40	Agree
2. It is fun to use ICT to teach mathematics.	3.47	Agree
3. ICT engagement doesn't make me feel tired and exhausted.	3.53	Agree
4. ICT engagement doesn't frustrate me.	3.67	Agree
5. ICT engagement doesn't make me mad.	3.60	Agree
6. ICT engagement doesn't frighten me.	4.00	Agree
Overall Mean	**3.61**	**Agree**

The degree of self-perception of teachers in the presence of ICT in the classroom of mathematics

The degree of self-esteem and control of teachers in the presence of ICT in mathematics is positive. They feel confident and in charge of their classroom instruction. This can be found in Table 5. It explains the teacher-respondents' self-esteem and power in mathematics while ICT is present. It demonstrates that teachers in secondary mathematics are knowledgeable, monitor their instruction, experience a sense of accomplishment, and thriving in the teaching classroom. As seen in the table above, I will have a mean score of 3.53 in charge of my teachings. Moreover, I will have a feeling of integrity in the classroom, and if I communicate with ICT, I will feel a sense of skill in the classroom with a mean score of 3.47 if I communicate with ICT. Also, I can have a sense of satisfaction with a mean score of 3.40 if I deal with ICT.

This finding was comparable to the results [40] since mathematics teachers are competent, have a sense of control and achievement, and also have an effective teaching experience in the classroom, which showed that most teachers agree that the use of technology can motivate and make mathematics more enjoyable, help them gain a greater understanding.

The total average of 3.46 suggests that mathematics correspondents are willing and capable of integrating ICT into the lesson. The machine availability will also help the instructor feel more in charge of his/her teaching. This result was close to the study [12] since the test results show that mathematics teachers felt supervised, knowledgeable, and performing. These results were comparable to the research. Both teachers and learners see how e-learning allows students to learn, has diversification activities, stimulates the inherent impetus of learning, and enables introverted students to engage in how the instructor feels their teaching.

Table 5. The self-esteem and control of teachers in the presence of ICT in classroom mathematics

Indicators	Mean	Qualitative Description
1. If I engage with ICT, I might have a feeling of competence in the classroom.	3.47	Agree
2. If I engage with ICT, I will be in control of my guidance.	3.53	Agree
3. I can feel satisfied when I work with ICT.	3.40	Agree
4. My job will be more successful if I engage with ICT.	3.47	Agree
Overall Mean	**3.46**	**Agree**

Degree of teacher perceptions of ICT use of mathematics

The extent of expectations of the purpose of teachers to use ICT in mathematics is nice. Teachers in mathematics intend to use ICT in mathematics instruction. They are well informed of the optimistic outcome of incorporating ICT into the lesson. This is seen in Table 6.

The purpose of teacher interlocutors to use ICT in mathematics is outlined. It revealed that mathematics teachers expect to use ICT in math. I intend to use ICT in mathematics, as seen by the average score at 4.13 in the graph. Also, I am willing to use ICT in math with a mean score of 4.07. Besides the average score of 4.00, I want to use ICT in teaching mathematics.

This is linked to research [41], as the results suggest that most mathematics teachers are prepared to use ICT for teaching mathematics. The application of ICT in higher education and learning: Two findings from the study indicate some teachers who were able to utilize ICT and were consistently using the techniques and registered an essential difference in the manner in which they developed and taught. These teachers considered ICT usage to be vital in teaching and studying and regularly using the in-service education coordinated by the school and the high school delegation.

The overall mean of 4.06 means that the teacher-respondents have a positive intention to use ICT in mathematics teaching. The finding is similar to the study of [42] entitled Preparedness of Educators to Implement Modern Information technologies in their Work with Preschool Children "the fact in our research is that educations are not passive when it comes to implementing computers in the process of realizing the contents of the Preparatory Pre-school program. As similar to the findings that the Mathematics teachers are willing to integrate ICT in their teaching.

Table 6. Intention of teachers to use ICT in mathematics

Indicators	Mean	Qualitative Description
1. I am eager to use ICT in mathematics instruction.	4.07	Agree
2. I want to use ICT in mathematics instruction.	4.00	Agree
3. I plan to use ICT in mathematics teaching.	4.13	Agree
Overall Mean	**4.06**	**Agree**

Summary of Level of Perception of the Mathematics Teachers

This illustrates the readiness of teachers to integrate ICT into teaching mathematics. It showed that the introduction of ICT into mathematics instruction was accepted favorably. It means that teachers of mathematics have the right mindset and can use ICT in teaching mathematics. Therefore, it helps learners understand and continue and love the learning experience at the same time.

It demonstrates the willingness of teachers to integrate ICT into teaching mathematics. It revealed that teachers' intervention to the ICT in mathematics has the highest mean of 4.06. It also showed an overall mean of 3.59, which means agreeing to integrate ICT in mathematics teaching. It means that mathematics teachers are confident and can use ICT for mathematics and intervene in mathematics. Thus, it will help learners explore, appreciate, and learn more while enjoying the teaching-learning process. However, the lowest mean of 3.38 is teachers' perception of their ability. It means that teachers need proper training in using ICT in teaching mathematics to help boost their confidence in using ICT in teaching mathematics and other learning areas.

This was reaffirmed in the study [38] as most teachers in Mathematics show positive behavior and readiness to use ICT in their teaching, which is also demonstrated by the study[32], which shows that teachers are ready to integrate technology into their instruction. It means that the incorporation of ICT into the lesson helps the students grasp the task better.

Table 7. Summary of Level of Perception of the Mathematics Teachers

Indicators	Mean	Qualitative Description
Perception of teachers' capacity	3.38	Neutral
Attitudes of teachers towards teaching in ICT	3.45	Agree
Teachers' attitude towards the application of ICT to student mathematics	3.61	Agree
ICT teacher passion in the algebra classroom	3.61	Agree
Self-esteem and instructor power in the case of ICT in the math	3.46	Agree
ICT interference by instructors in mathematics	4.06	Agree
Overall Mean	**3.59**	**Agree**

The Pretest Performance of the Control and Experimental Group

The control and experimental group's pretest performance shows significant differences between the two groups. It shows that the experimental group got high results in the pretest. It means that they perform better than the control group, as shown in table 8.

Since the mean score of the experimental group is 16.5882, a variance score of 3. 4616 is greater than the mean score of the control group, 12.9629 with a variance score of 8.1908. The research hypothesis is confirmed, which means that there is a significant difference between the two groups. It implies that the experimental group performs better than the control group. The parents-teachers conferences revealed that most parents of the experimental group attended meetings. It also revealed that both parents were in the home guiding their children. Compared to the control group, where most of the students lived with their relatives, and others were underwent boarding, these students came from other barangays like Palitud and Poblacion. It was also revealed that most parents were working in the government, few were contractors, and the rest were farmers, as was seen in the School Form 1 of the experimental group.

This finding was related in the study of [43] that parent involvement can increase academic performance, which is interrelated in the results of this study that both parents were in the home guiding their children. It denotes that parents have a vital role in guiding their children.

Table 8. Control and experimental group pretest output

	Control Group	***Experimental Group***
Mean	12.96296296	16.58823529
Variance	8.190883191	3.461675579
Observations	27	34

Significant Difference of the Pretest Performance of the Control and Experimental Group

The control and experimental group's pretest performance shows a significant difference in their performance between the two groups. It shows that the experimental group got high results in the pretest. It means that they perform better than the control group. This implies that factors that cause the experimental group's high performance include socio-economic status, parental involvement, and both students' and parents' attitudes on mathematics education. These were seen in their School Form 1 filed by the adviser. In addition to most of the students, the experimental group was composed of more excelling students with modest family backgrounds. These factors are crucial for learners to be guided in the studies to succeed in their chosen endeavor.

Table 9 revealed that the t-computed value is -5.6953 is greater than the t-critical value of 2.0166 with a degree of freedom of 43 at a 0.05 level of significance. The research hypothesis is confirmed, which means that there is a significant difference between the two groups. It shows that the experimental group performs better than the control group.

These findings were associated with [44] because socio-economic status, parental involvement, and both students' and parents' attitudes on mathematics education impact students' achievement, similar to this finding that financial-status and parents involvement affect the performance of their children in the classroom.

It is also connected to the study of [45] states that their higher Socio-Economic Status students have the confidence to make sense of mathematics, similar to this finding that most parents worked in the government. It shows that parents can help their children academically and financially, like assisting their children in their assignments and projects compared to the lower economics-status.

Table 9. Significant Pretest Performance of the Control and Experimental Group

	Control Group	***Experimental Group***
Mean	12.96296296	16.58823529
Variance	8.190883191	3.461675579
Observations	27	34
Df	43	
t Stat	-5.695300182	
t Critical two-tail	2.016692199	

The Posttest Performance of the Control and Experimental Group

The posttest performance of the experimental group has a higher score than the control group. It means that the experimental group performs better than the control group. It shows that Computer Integration of Data Analysis (CIDA) using Microsoft Excel contributes to the experimental group's performance. It implies that using or integrating computers in the lesson will add to the lesson's understanding more.

Table 10 denotes that the experimental mean score of 20.91176 with a variance score of 7.0525 is greater than the control group mean score of 13.6666 with a variance score of 7.3846. The research hypothesis was confirmed, which means that there is a difference between the two groups. It implies that the experimental group performs better with the Computer Integration of Data Analysis using the Microsoft Excel in Solving Statistics than the control group, which did not use the CIDA.

The previous study [25] The impact of Computer Assisted Instruction on the achievement of 7th-grade mathematics shows the findings that MobyMax has improved student performance compared to those receiving the standard Direst Instruction. This is parallel to the research findings revealed that using the Computer Integration of Data Analysis using Microsoft Excel increased the students' performance in Statistics of the Grade 11 students. It indicates that using ICT has a significant effect on the performance of the learners.

Table 10. The Posttest Performance of the Control and Experimental Group.

	Control Group	***Experimental Group***
Mean	13.66666667	20.91176471
Variance	7.384615385	7.05258467
Observations	27	34

Significant Difference of the Posttest Performance of the Control and Experimental Group

The posttest performance of the experimental group was higher than the control. It means that the experimental group performs better than the control group. It shows that Computer Integration of Data Analysis (CIDA) using Microsoft Excel contributes to the experimental group's performance. It implies that using or integrating computers in the lesson will add to understanding the task more.

Table 11 revealed that the t-computed value of -10.4472 is greater than the t-critical value of 2.0040 with a degree of freedom of 55 at a 0.05 level of confidence. The research hypothesis is confirmed, which means that there is a statistically significant difference between the two groups. It implies that the experimental group performs better with the Computer Integration of Data Analysis using the Microsoft Excel in Solving Statistics than the control group, which did not use the CIDA.

It confirms that the previous researches by [46] showed that teachers who used CAI required better ways to bring technology into the classroom to enjoy the benefits. Equally [47] found reasons Computer-Aided Instruction could be more effective than traditional instruction. These findings were related to this study's results because it indicates that using Microsoft Excel marks students' better performance than those who did not use the software. It designates that ICT affects the performance of the students.

Table 11. Significant of the Posttest Performance of the Control and Experimental Group.

	Control Group	***Experimental Group***
Mean	13.66666667	20.91176471
Variance	7.384615385	7.05258467
Observations	27	34
Df	55	
t Stat	-10.44724722	
t Critical two-tail	2.004044783	

Significance Difference in the Pre and Post Tests

The difference between the control and the experimental group before and after testing is essential. It means that the experimental group exposed to Computer Integration of Data Analysis (CIDA) using Microsoft Excel performs better than the control group who are not exposed. It implies that computer integration in the lesson offers dynamic understanding in the lesson. It also implies that manipulating the technology in the learning process gives a broad and deep appreciation of the lesson while learning by doing.

Table 12 revealed that the t-computed value of -1218 is greater than the t-critical value of 2.0048 with a degree of freedom of 54 at a 0.05 level of confidence. The research hypothesis was confirmed, which means that there is a significant difference between the two groups. It shows that the experimental group improved performance than the control group. It implies that the use of Microsoft Excel in solving Statistics has a positive effect on the performance between the two groups.

This finding interrelated to the studies of [48] that their results showed that students who have a computer available at home and school tend to perform better and showed a significant positive relationship between students who used computers at home and their Mathematics achievement. Their findings were related to the result of this study, which revealed that using Microsoft Excel in solving Statistics has a positive effect on the students' performance. It suggests that the integration of ICT in teaching directly affects the performance of the students.

Table 12. The Significant Difference in the Pre and Post Test of the Control and Experimental Groups

	Pretest of the Control Group	***Posttest of the Experimental Group***
Mean	12.96296296	20.91176471
Variance	8.190883191	7l05258467
Observations	27	34
Df	54	
t Stat	-11.12188357	
t Critical two-tail	2.004879288	

CONCLUSIONS

The following conclusions are taken based on the findings: The mathematics teachers were unwilling to use ICT, but they had constructive attitudes and had to incorporate ICT into mathematics teaching. The students' success improved with their parents' ongoing participation. The students' success has been further developed with continuous parental involvement in student academic activities. After exposure, students gained fundamental knowledge such as ICT skills, skills in solving, and analytical thinking skills using Microsoft Excel to solve statistics problems. The students' efficiency is improved using the Microsoft Excel computer integration of data analysis. The incorporation of data analysis by Microsoft Excel has enhanced student success in solving statistical problems.

RECOMMENDATIONS

As a logical offshoot of the findings surfaced, the following are highly recommended: (1) Teachers should be ready to integrate ICT in their lessons in teaching Mathematics. (2) The school should encourage stakeholders, especially parents, to involve in their children learning routines. (3) Emphasize home-visitation and stress students' counseling should be done regularly. (4) The acquired basics skills should be applied in the learning classroom as well as real-life situations. (5) Sustain the Computer Integration of Data Analysis (CIDA) application using Microsoft Excel in solving problems in Statistics in the Mathematics Department. (6) Mathematics teachers should integrate ICT in teaching Mathematics. And (7) Potential future action research should investigate whether technology integration's gained in student engagement results in a corresponding increase in student achievement.

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