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Instructional Technology Classroom Integration and Math Scores of the Fifth Grade Students

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Abstract
This study examined the instructional technology integration and Mathematics scores of 5th grade students in PARCC state assessment in school district of Maryland, USA. Constructed in the theoretical framework of Unified Theory of Acceptance And Use Of Technology (UTAUT) by Venkatesh, Morris, Davis and Davis (2003), key variables that significantly contributes to outputs and the conceptual framework had been designed in the context of socio-demographic characteristics, instructional technology utilization, content delivery for mastery, and behavioral intentions to assess students mathematics performance through the use of instructional technology. Using descriptive and correlational designs, respondents were 91 students and 8 teachers participated in the study. Results revealed that instructional technology utilization played significant role in the teaching and learning process. The amount of time in using technology along with the socio-demographic characteristics such as area of specialization and educational attainment of parents were found to be positive predictors to students' mathematics achievement. Further in-depth study on what procedure that contributes to student learning in mathematics whether learning the software process of computation versus manual calculation had been recommended.

Keywords: content delivery, assessment, instructional technology, mathematics achievement.

1. Introduction

Establishing relationship between technology integration in the classroom and student achievement is a viable and potent research. While the investment in technology over the last couple of years has been tremendous, there is little to nothing of research that directly states the impact of technology use on student achievement.

Educators in the United States are held accountable for student achievement as outlined in the No Child Left Behind (NLCB) Act of 2001. Alongside NLCB was the simultaneous proliferation of technology. Technology is ever present in our daily lives. The study Managing Teachers' Barriers to ICT Integration in Singapore Schools, authored by Lim and Khine (2006) found thatover the past few decades rapid technological development and innovations have created unprecedented impacts on our day-to-day activities. Likewise, Wozney, Venkatesh, and Abrami (2006) have found that schools are experiencing exponential growth in the use of computer technology for learning in K-12 schools. Oyebolu and Olusiji (2013) noted that Information and Communication Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of ICT as part of the core of education, alongside reading, writing, and numeracy (Muhaimin et al., 2020; Prasojo et al., 2020; Rakimahwati et al., 2022).

The NCLB Act raised the standard for student achievement. Along with it came increased mandated accountability in the form of state reporting mechanisms. In the state of Maryland, student achievement is measured using the Partnership for Assessment of Readiness for College and Careers (PARCC). It is a group of states working together to develop a set of assessments that measure whether students are on track to be successful in college and careers. Given the legislation and the abundance of technology, the researchers wondered whether technology has an impact on student data. If technology is available and used in the classroom, does it translate to results as measured by assessments, such as the PARCC state assessment. While there is undoubtedly significant investment in technology in schools that establish the connection between its utilization and academic performance, there seemed to be limited research that establishes a connection between technology integration in terms of the amount of time utilized for content mastery and the performance of students on high-stakes achievement tests. This study seeks to determine if a relationship exists in the use of technology and achievement scores of students in 5^{th} grade in the PARCC assessment.

Students are exposed to a variety of technology during instruction that teachers and administrator believe promote exponential growth in children. Growth, called student achievement, is measured by state assessments that become the basis of accountability reporting system. Scores on the National Assessment of Educational Progress indicate that technology affects student achievement in some surprising ways (Wenglinsky, 2006). But not everybody agrees on this one. Wenglinsky wrote some researchers argued that computers had a deleterious effect on young children's social, emotional, and physical development. In addition to the critics of computers in the lower grades, some criticized the use of computers in education in general. Most famously, Choy (2014) argued that history was rife with examples of schools requiring teachers to use some new, unproven technology in the classroom; computers were just the latest example. In case studies at various grade levels, Choy found that advocates' claims about computers' benefits were overstated. Oginni (2015) went further, presenting stories of simplistic, mindless assignments that would never have passed muster had they not had the window dressing of using a computer. With the polarizing views on instructional technology and its relationship with student achievement, this study aims to look at whether there is a relationship between technology usage and assessment scores in students in 5^{th} grade in the PARCC assessment.

The general aim of this study was to find out the relationship on the use of instructional technology on students' performance in state assessments in mathematics administered by Partnership for Assessment of Readiness for College and Careers (PARCC). Specifically, the researcher sought to: a) find out the relationship between the socio-demographic characteristics of student respondents and their academic performance in mathematics; b) find out the relationship of the socio-demographic profile of teacher respondents and their students' performance in mathematics during Spring 2018 thru PARCC Assessment; c) find out the relationship between teacher respondents' instructional technology integration and students' performance in mathematics in Spring 2018 thru PARCC Assessment; and d) find out variables that predict student's score thru PARCC assessment in mathematics.

2. Review of related literature

To put the discussion into perspective, it is worthwhile to define what technology is. Instructional technology integration is the innovation, change, or modification of the classroom environment in order to satisfy student needs. It comprises the entire instructions and encompasses engineering know-how and design, manufacturing expertise, and various technical skills (Parkay et al., 2014). For this study, instructional technology is used in the context of modification of the classroom environment, including instruction, to meet the needs of digital native students. It would be amiss to only think of technology in terms of the hardware and software, especially in the context of the classroom. Teachers play a huge role in the selection and implementation so that technology is not only received by students but also use it to access content and help develop more in-depth mathematical under-standing knowledge (Meagher, 2012).

Various studies have engaged in instructional technology utilization (Parkay et, al, 2014; Meagher, 2012; Nicholas & Ng, 2012; Yu-Liang, 2011; Mulyono, Bátyi, & Mukminin, 2023; Velasco, Ibarra, & Mukminin, 2022; Susanti, Hadiyanto, & Mukminin, 2022). Integrating technology early in education may allow the student to become more aware not only on how to use the technology, but also may give the student more confidence in the subject, especially mathematics. Another study confirmed this by reporting students felt more comfortable using technology since it allowed the student to be more accurate in mathematics. Although not all students feel comfortable using technology, most students in one study reported the use of technology alleviated some of the anxiety with mathematics and the anxiety associated with students taking tests (Meagher, 2012). If familiarity of using technology in the mathematics classroom can benefit students by allowing the students to feel more comfortable, then educators need to take the opportunity to incorporate technology in the pedagogy on a regular basis. Educators of course must have professional training to use the technology in the classroom and must feel comfortable using the technology themselves. The competence of the technology use by the instructor and the attitude of the instructor behind the technology can have the most effective action toward the success of the mathematics in the classroom (YuLiang, 2011).

More research confirmed this by stating that teacher attitude with technology integration and successful implementation of technology in the classroom can be more significant than any other factor when incorporating technology into the curriculum (Hidayati & Budiyono, 2018; Nicholas & Ng, 2012). Administrators, curriculum leaders, and teachers need to have professional training in technology, be supportive of the process of technology integration, and be willing to assist others in the use of technology throughout the curriculum since “technology cannot be grafted onto existing curricula; it must be integrated thoughtfully” (Parkay, Anctil, & Hass, 2014, p. 49). Murphy (2016) examined instructional technology in learning mathematics, especially early in education is crucial to the development of a student’s mathematical abilities as the student progresses through the educational process. Mathematics concepts are hierarchical in content where one topic must be understood before the next topic is introduced. If students miss key components of one topic, then that could hinder the student fully grasping not only that concept, but also the concepts to follow. Students need to be engaged in the learning of mathematics, and it is a necessity that educators use methods in the classroom that will help in the process of student engagement to help motivate the students to get a deeper understanding of mathematics. If students stay motivated in the pedagogy of the learning process, then students will more likely be successful in mathematics, and this is especially likely for male students. One strategy to help in this process is to implement technology throughout the curriculum and especially in the mathematics classrooms. Using technology in the classrooms, as the studies suggested, can increase student engagement, increase motivation to learning, allow for better teacher-student interaction, support student collaboration, assist in the accuracy of mathematical computation, and help students not only feel more comfortable with learning mathematics but also allow for a deeper understanding of the mathematical concepts. The positive effect of using technology throughout the curriculum can assist student learning mathematics to higher-order thinking that can help students even beyond the classroom.

To this extent, the use of technology within the curriculum from elementary to high school is necessary for the betterment of learning mathematics. Finally, it is expectant that educators will continue to use technology in new ways in the classroom to help students be prepared for today’s ever-changing technology driven society. Rosas and Campbell (2010) explored instructional technology using iPad integration in a geometry classroom to increase student engagement which then could result in higher tests scores, and higher levels of self-efficacy and meta-cognitive self-regulation. Although the use of the iPads may have some drawbacks that can be overcome, the increased student engagement in the classroom was observed. One of the implications of the study indicates that iPad professional training and pedagogy is important in not only content delivery, but for on-task student behavior as well. It is crucial for educators to have professional training in the use of technology so that the motivation behind the use of the technology is being transferred to the students (Rosas & Campbell, 2010). Further research is needed by educators to explore iPad integration in other mathematics courses along with different instructional methods. In addition, the iPads in this study were only used in the geometry class. Because of the limited use of the iPads, students could have been new to its use and the novelty could have had a factor as students were exploring the extent of the iPad. One possible solution to this could have been iPad integration throughout the curriculum in all subjects so that students would be familiar to the iPad. Integrating technology throughout the curriculum in all subjects allows students to be more engaged in the classrooms, and have more confidence in the technology, which may lead toward a greater confidence in the subject (Allsopp, McHatton& Farmer, 2010).

3. Methods and materials

This study was anchored on the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris, Davis and Davis (2003). Technology integration into the classrooms has almost become one of the most rated topics to discuss after the introduction of the technology to the classrooms. This theory integrated elements from eight Information Technology Acceptance Models to create their model. Gender, age, experience, and voluntariness of use were added to the model and were hypothesized to moderate the impact of four constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions on intention to use and usage behavior. Both the quantitative descriptive and correlation design were utilized to identify, analyze, and describe the instructional technology integration in relation to student academic performance in mathematics. Two groups of participants on the study via total enumeration sampling were utilized. There were ninety-one 5^{th}-grade students in a general education classroom on the diploma track and 8 mathematics and non-mathematics major teachers at Bladensburg Elementary School in Prince George's County Public Schools.

Two types of research survey instruments were used: Instrument for Teacher-Respondents and for Student-Respondents. The first instrument was for teacher-respondents consisting of the three parts: a) socio-demographic characteristics, b) perceptions on three subcomponents of instructional technology integration such as the use of instructional technology, content delivery in using instructional technology, and 3) behavioral intentions. Included in the performance of 5^{th} grade students in Mathematics was through PARCC Assessment scores. Data from academic year Fall 2017 and Spring 2018 have been tabulated and described according to five levels such as Level 1 (Did Not Meet Expectations) with the score range from 650-699, Level 2 (Partially Met Expectations) with the score range from 700-724, Level 3 (Approach Expectations) with the score range from 725-750, Level 4 (Met Expectations) with the score range from 751-809, and Level 5 (Exceeded Expectations) with the score range from 810-850. These numerical scores are standard values given by PARCC Assessment in the whole United State of America. This part of the instrument had been filled out by the teacher respondents for individual student score.

The Second Instrument is for Student Respondents consisting of two main parts: Part I consists of a checklist for the description of the socio-demographic profile of student respondents. The instrument provided a checklist about their socio-demographic characteristics like age, sex, ethnicity, parents' highest educational attainment, father's occupation, mothers' occupation, and inclination to technology. Part II includes students' perceptions on Instructional Technology Utilization in the classroom such as type of technology utilized for learning mathematics, amount of time spent in using technology website/software for learning mathematics, technology website/software used for learning mathematics, level of skills in using technology, and amount of time utilized by students for content mastery.

In determining the reliability of the instrument, a pilot testing was conducted to selected mathematics teachers who used instructional technology in teaching mathematics and 5^{th} grade students in the neighboring elementary school county. The results were analyzed using the Statistical

Package for Social Science (SPSS) and got a Cronbach coefficient alpha of 0.812 for its internal consistency suggesting the instruments' consistent validity and reliability. Different statistical tools have been utilized for this study to analyze the data. Pearson Product Moment Correlation was used to find out the significant relationship between independent and dependent variables. The multiple linear regressions were also utilized to determine whether the socio-demographic profile could be predictors of mathematics score in PARCC Assessment test.

4. Results and Discussion

4.1 Relationship between teacher's socio-demographic profile and student's performance in mathematics

Table 1 presents the relationship between teacher's socio-demographic profile and student's performance in Mathematics by the 5th grade students at Prince George County Public School in Maryland, USA.

Table 1. Relationship between teacher's socio-demographic profile and student's performance in mathematics

Teacher's Socio-Demographic Profile	Performance in Mathematics	
	r	**p-value**
Age	0.109	1.034
Sex	0.447	0.199
Ethnicity	0.211	1.239
Highest Educational Attainment	0.572	0.028
Years of Teaching	-0.899*	0.013
Area of Specialization	0.597*	0.033
No. of Personal IT Equipment	0.448*	0.039

Legend: * significant at $p < 0.05$

To determine whether the teacher's socio-demographic profile is related to their student's mathematics performance, correlation using Pearson r was computed. Results showed that area of specialization had moderate positive correlation ($r = 0.597$, $p <0.05$). It indicated that student with math major teacher seems like to perform better than those who have non-math major teacher. This correlation result was in conformity with the findings of Moein et al. (2018)stating that students who had access to the modules prepared by mathematics teacher as his or her area of specialization performed significantly better in their post-test, with their scores improving by 13 percent compared to students who used modules prepared by non-mathematics teacher respectively. The students' feedback indicated that they felt more engaged in the course by using the instructional technology modules. Participant feedback provided evidence of the advantages of using student-centered classrooms and integrating technology in lecture-based courses when prepared by pure mathematics teacher. Correspondingly, the number of personal IT equipment of the teacher had strong moderate correlation to student's mathematics performance ($r = 0.448$, $p <0.05$). It only showed that number of personal IT equipment of the teacher mattered, the more possession of IT equipment by the teacher most likely indicates higher performance of the students in mathematics. The result confirmed with the findings of Ratnayake and Oates (2016) about various types of technology equipment teachers utilized in the classroom for learning mathematics which states that the more equipment are provided for the teaching and learning process, the better student involvement and engagement which produce greater outputs.

On the other hand, further analysis of the data revealed that years of teaching was related to the students' mathematics performance ($r = -0.899$, $p < 0.05$). The negative value of r indicated that teachers who are new in service seemed to relate more on the mathematics performance of students. This result was in lined with the research findings of Oginni (2015)young mathematics teachers and Vogel-Walcutt et al.(2010) relative to teacher's years of tenureship and students' mathematics performance. Both studies revealed that young mathematics teachers were most likely to innovate compared to older ones. As such, teachers who were young in service tended to perform better in using instructional technology that produced greater output by the students. Further, gender and instructional technology was found to influence academic performance of students in mathematics. These meant that a male teacher who is new to teaching career tends to perform better which greatly influences students' performance in math using such instructional technology. To aptly put, the lesser years of teachers' teaching performance using instructional technology, the higher the students' engagement and output in mathematics. Therefore, the null hypothesis stating that there is no relationship between teacher's socio-demographic profile and student's performance in mathematics was hereby rejected.

4.2 Relationship of students' socio-demographic profile and students performance in mathematics through PARCC

Table 2 presented the relationship between students' socio-demographic profile and student performance in Mathematics thru PARCC state assessment. Among the eight items being run for correlations, there were two variables that established significant relationships: the father's highest educational attainment and mother's occupation. To determine whether the student's socio-demographic profile is related to their mathematics performance, correlation using Pearson r was computed. As depicted on the table, results showed that father's highest educational attainment had moderate positive correlation ($r = 0.586$, $p < 0.05$). It indicated that the higher the educational attainment of the father, the higher the mathematics performance of the student. The result was in agreement with the findings of Hill and Ball (2014) that educational attainment of parents played significant role in the academic achievement of their children. In mathematics achievement, students which professional fathers were found to most likely perform better compared to students having non-professional parents. Similarly, mother's occupation had strong positive correlation to student's mathematics performance ($r = 0.709$, $p < 0.05$). It only pointed out that students having a mother with white collar jobs tended to perform better in mathematics than those students having a mother with blue collar job.

Table 2. Relationship between Students' Socio-demographic Profile and their Performance in Mathematics thru PARCC

Students' Socio-Demographic Profile	Performance in Mathematics	
	r	p-value
Age	0.237	0.207
Sex	0.112	0.442
Ethnicity	0.441	0.287
Father's Highest Educational Attainment	0.586*	0.034
Mother's Highest Educational Attainment	0.122	0.104
Father's Occupation	0.132	0.111
Mother's Occupation	0.709*	0.027

Legend: * significant at $p < 0.05$

Results were similarly chronicled as that of Leung and Bolite-Frant (2015) and Means (2010) about type of parents' occupation that greatly influenced their students' academic performance in mathematics. In the findings of Leung and Bolite-Frant, they noted that mothers who assumed the work position or white-collar job performing managerial, professional, and administrative designations may greatly influence academic achievement of their children in Mathematics and

English compared to mothers with blue collar job working as working-class people who perform manual labor. Consequently, the null hypothesis stating that there is no relationship between students' socio-demographic profile and their performance in mathematics thru PARCC was hereby rejected.

4.3 Relationship of teacher respondents' instructional technology utilization and students performance in mathematics through PARCC

Table 3 presented the relationship of Teacher Respondents' Instructional Technology Utilization and Students Performance in Mathematics thru PARCC. To determine whether teacher's instructional technology integration is related to the mathematics performance of their students, correlation using Pearson r was computed. Results showed that all the items in instructional technology utilization was related. Specifically, type of technology utilized($r = 0.321$, $p < 0.05$), amount of time spent in preparing instructional technology($r = 0.425$, $p < 0.05$), technology website/software used for learning mathematics ($r = 0.316$, $p < 0.05$), amount of time utilized by students for content mastery had strong positively correlation to student's mathematics performance ($r = 0.779$, $p < 0.05$), level of skills in using technology($r = 0.632$, $p < 0.05$), and related instructional technology training attended ($r = 0.377$, $p < 0.05$). It only indicated that the instructional technology utilization matters, that the higher the utilization of the teacher, the higher the mathematics performance of the students.

The foregoing results concurred with the findings of Kuppalapalle and Tammy (2016) that improving student performance and retention in mathematics classes requires inventive approaches through instructional technology. Kuppalapalle and Tammy found out that instructional technology utilization, in-class problem solving and application (or discussion) sessions are important factors in the enhancement of students' deep understanding of mathematics. These details included various components of the course like daily online homework sets, online skills tests, application sessions and projects, in-class tests, and comprehensive final exam and discuss how we obtained optimal results enhancing the traditional teaching techniques.

Table 3. Relationship between Teacher's Instructional Technology Utilization and Student's Performance in Mathematics thru PARCC

Instructional Technology Integration	Performance in Mathematics	
	r	**p-value**
tructional Technology Utilization	***0.569****	***0.037***
1. Type of Technology Utilized	0.321*	0.038
2. Amount of Time Spent in Preparing Instructional Technology	0.425*	0.037
3. Technology Website/Software Used	0.598*	0.022
4. Amount of Time Spent in Using Technology Website/Software	0.861	0.078
5. Level of Skills in Using Technology	0.632*	0.049
6. Related Instructional Technology Training Attended	0.377*	0.019
Content Delivery Using Instructional Technology	***0.238***	***0.108***
1. Amount of Time Utilized by Students for Content Delivery	0.617	0.251
2. Amount of Time Utilized by Students for Content Mastery	0.008	0.119
3. Amount of Time Utilized for Assessment Mastery	0.216	0.342
Behavioral Intentions	***0.333***	***0.322***
1. Performance Expectancy	0.419	0.079
2. Effort Expectancy	0.290	0.065
3. Social Influence	0.422	0.153
4. Facilitating Conditions	0.511	0.265

Legend: * significant at $p < 0.05$

The result on the amount of time spent by students for content mastery confirmed the findings of Leung and Bolite-Frant (2015) and Means (2010) about the time duration spent by students in learning specific concept in Mathematics. Their findings highlighted the importance of integrating ample time as school practice in the areas of mathematics class using various software as well as teacher practices concerning management and use of software-generated student performance. This meant that the more time students spend in instructional technology, the greater their mathematics performance output. Level of skills in using instructional technology was likewise found to have strong significant correlation with student achievement in mathematics using instructional technology. This result conformed with the findings of Ratnayake and Oates (2016) about the level of teachers and students' use of instructional technology. They found that skills of younger teachers in an institution performed significantly higher compared to older teachers, this finding paved way to suggesting the intervention provided with respect to task design led to improved pedagogical technology knowledge for the teachers, and hence a richer task. The delivery of the intervention could be of assistance in focusing professional development programs so they may better facilitate the training of teachers in the use of digital technology in teaching mathematics.

Training attended revealed to have significantly correlated with student performance in mathematics. These findings confirmed Hill and Ball (2014) that one of the prime source of knowledge and skills of teachers to acquiring instructional technology skills coming from the technology conferences and seminars which will significantly be used in student learning process. This premise confirmed the results of this study that the more teachers attend conferences related to instructional technology, the better their teaching performance through the use of supplementary materials and ideas obtained from the conferences. Therefore, the null hypothesis stating that there is no relationship between teacher's instructional technology utilization and student's performance in mathematics thru PARCC was hereby rejected.

4.4 Relationship between student's instructional technology utilization and their performance in Mathematics

Table 4 presented the student respondents' instructional technology utilization and its relationship to their performance in Mathematics. To determine whether student's instructional technology utilization is related to their mathematics performance, correlation using Pearson r was computed. Results showed that technology website/software used for learning mathematics had weak positive correlation ($r = 0.316$, $p < 0.05$). It indicated that student who used technology website/software for learning mathematics tended to perform better than those who did not. The findings of Umuginareza et al. (2018) further indicated that learners' propensity to use instructional technology in instructional practice was associated with demographic factors related to teaching and learning experience, gender, level of study and participation in professional learning activities. The study also showed that learners who have constant utilization and access to internet instructional resources have higher levels of confidence and achievement in mathematics, and hold broader beliefs about the nature of mathematics, and increase the skills in learning mathematics than learners who do not use and exposed to the instructional technologies.

Table 4. Relationship between students' instructional technology utilization and their performance in Mathematics

Students' IT Utilization	**Performance in Mathematics**	
	r	**p-value**
A. Type of Technology Utilized for Learning Mathematics	0.388	0.058
B. Amount of Time Spent in Using Technology Website/ Software for Learning Mathematics	0.142	0.186
C. Technology Website/Software Used for Learning Mathematics	0.316*	0.033
D. Level of Skills in Using Technology	0.231	0.234
E. Amount of Time Utilized by Students for Content Mastery	0.779*	0.016

Legend: * significant at $p < 0.05$

Likewise, the amount of time utilized by students for content mastery had strong positive correlation to student's mathematics performance ($r = 0.779$, $p < 0.05$). It showed that the higher the time the student utilized for content mastery the better performance in mathematics. Results of the study on the amount of time using instructional technology for content mastery confirmed the findings of Parkay et al (2014), Meagher (2012), Nicholas and Ng (2012) and Yu-Liang (2011).

In the study of Parkay et al. (2014), integrating technology for a period of time in classroom discussion may allow the student to become more aware of not only how to use the technology, but also may give the student more confidence in mathematics. Meagher (2012) confirmed this by reporting students felt more comfortable using instructional technology for at least 15-20 minutes per session since it allowed the student to be more accurate in mathematics. Although not all students feel comfortable using technology, most students in one study by Nicholas and Ng (2012) reported the use of technology during class hours alleviated some of the anxiety with mathematics and the anxiety associated with students taking tests. Yu-Liang (2011) found that familiarity of using technology in the mathematics classroom during class sessions can benefit students by allowing the students to feel more comfortable, then educators need to take the opportunity to incorporate technology in the pedagogy on a regular basis. The amount of time combined withthe competence of the technology use by the instructor and the attitude of the instructor behind the technology can have the most effective action toward the success of the mathematics in the classroom. Therefore, the null hypothesis stating that there is no relationship between student's instructional technology utilization and their performance in mathematics was hereby rejected as well.

4.5 Socio-Demographic Profile as Predictor to Students Performance in Mathematics

Table 5 presents the multiple regression predicting the students' mathematics performance thru PARCC Assessment in Spring 2018. It can be seen from the table that there were identified predictors for students' academic performance in Mathematics. As depicted on the table, data have been presented the multiple regression analysis that determined the predictors of students' mathematics performance thru PARCC assessment. Preliminary assumption testing was conducted to check on normality, linearity, multi-collinearity, and homoscedasticity with no serious violation noted. Analysis was performed at 0.05 significance level.

Table 5. Multiple regression predicting the students' mathematics performance through PARCC Assessment

PREDICTORS	β	Std. Error	t	*p*
Constant	27.423	3.364	4.507	0.000
Father's Highest Educational Attainment	0.322	0.420	-0.321	-0.412
Mother's Occupation	11.602	0.148	-2.535	0.056
Amount of Time Utilized by Students for content Mastery	6.660	0.134	0.498*	0.033
Teacher's Highest Educational Attainment	0.640	0.207	3.211	0.376
Teacher's Area of Specialization	-3.207	0.111	2.555*	0.021
Teacher's Length of Service	-6.421	0.534	0.412*	0.031
Number of Personal IT Equipment	7.308	0.601	0.277	0.054
Instructional Technology Utilization	3.51	0.236	2.126*	0.032

Note: Regression coefficient is unstandardized.
$R^2 = 0.311$, Adj. $R^2 = 0.297$, $F_{(7, 83)} = 154.06$, $p < 0.05$
Mother's Occupation: 1 - Government, 2 – Private, Teacher's Area of Specialization: 1 – Math, 2 – Non-Math

Analysis of the data revealed that amount of time utilized by the student for content mastery significantly affects mathematics performance (β = 6.660, Std. Error = 0.134, $t_{(7,83)} = 0.498$, $p < 0.05$). The regression coefficient was positive indicating that students tend to perform better if they maximize the amount of time utilized for content mastery. This result was consistent with the findings of Umugiraneza et al. (2018) and Murphy (2016) that students' performance in mathematics tends to increase when they are given consistent ample time to master specific mathematics content during class discussion.

Likewise, instructional technology utilization is a positive predictor ($\beta = 3.510$, Std. Error = 0.236, $t_{(7,83)} = 2.126$, $p < 0.05$) denoting that the utilization of IT equipment matters, the higher the IT utilization of the teacher the more likely the students perform better in mathematics. This corroborates with the findings of Kuppalapalle and Tammy (2016), that improving student performance and retention in mathematics classes requires inventive approaches and constant utilization through instructional technology. An innovative teaching method that incorporated computers software with application sessions in mathematics classes found to increase student performance in mathematics.

On the other hand, further analysis of the data revealed that teacher's area of specialization significantly affects the students mathematics performance ($\beta = -3.207$, Std. Error = 0.111, $t_{(7,83)} = -2.555$, $p < 0.05$). The negative coefficient indicated that teachers who are math majors seem to affect in the performance of students in mathematics than those who are non-math majors. This result coincided with Yu-Liang, (2011) that the teaching competence of the technology use by the mathematics instructor and the attitude of the instructor behind the instructional technology can have the most effective output toward the success of the learners in mathematics in the classroom compared to those given instruction by non-mathematics teachers.

Similarly, teacher's length of service was a negative predictor of students mathematics performance ($\beta = -6.421$, Std. Error = 0.534, $t_{(7,83)} = -0.412$, $p < 0.05$) specifying that teachers that are new in service tend to contribute more on the mathematics performance of the students. The result was consistent with the findings of Tella (2017) that teaching performance of newly hired teachers had significant correlation with student academic performance in mathematics which means that teachers who are just starting to teach mathematics through technology most likely to be productive in the teaching and learning process that seems to influence student learning compared to old mathematics teachers.

Taken together all the predictors of students' mathematics performance, the R^2 is 0.311. This finding indicated that 31.10% of the variability of the dependent variable which is students' mathematics performance thru PARCC assessment is explained by the predictors of the study. The other 68.90% is explained by the other factors not included in the present study. Meanwhile, father's highest educational attainment, mother's occupation, teacher's highest educational attainment, and number of personal IT equipment do not predict the student's mathematics performance. Therefore, the null hypothesis stating that there would be no variable predictors that would forecast the students' mathematics performance thru PARCC assessment was likewise rejected since there had been identified variables that would predict student academic performance in Mathematics using instructional technology integration in the classroom.

5. Conclusions

It indicated that student with math major teacher equipped with personal instructional technology in mathematics seems like to perform better than those who have non-math major teacher. It only showed that teachers' possessing personal instructional technology equipment mattered, the more owned instructional technology equipment be likely to have higher the performance by the students in mathematics. Further, for student socio-demographic profile and students' mathematics performance, it indicated that the higher the educational attainment of the father definitely suggests student's higher the mathematics performance. Similarly, student having a mother with white collar jobs tends to perform better in mathematics than those students having a mother with blue collar job.

For instructional technology utilization, all the items in instructional technology utilization were related such as type of technology utilized, amount of time spent in preparing instructional technology, technology website/software used for learning mathematics, amount of time utilized by students for content mastery established were positively correlated to student's mathematics performance. These include level of skills in using technology and related instructional technology training attended. It was concluded that the higher the teachers' use of instructional technology would most likely suggest students' higher mathematics performance. Moreover, predictors to student performance that significantly affects students' mathematics include the amount of time utilized by the student for content mastery, instructional technology utilization, teachers' area of specialization and years of teaching. Equally, students tend to perform better if they maximize the amount of time utilized for content mastery. Utilizing instructional technology equipment matters, the higher the teacher's utilization of instructional technology the more likely the students perform better in mathematics.

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