

IMPACT OF LEARNING MATHEMATICS USING CARTOON

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Abstract

It is noteworthy to examine the influence of cartoon in today's generation. The experience is warm, charming and memorable. The study sought to investigate the impact of learning Mathematics using cartoon, the moderating roles of gender on participants' achievement in Mathematics was also examined. A pre-test, post-test, control group experimental design was adopted. One hundred and ninety (190) co-educational private primary two pupils from four purposively selected primary schools from Ijebu-Ode Local Government Area of Ogun State constituted the sample for the study. Three hypotheses were tested. Three instrument was used for the study: two procedural instruments was used for teaching and one measurement for data collection. The data collected were subjected to Analysis of Covariance (ANCOVA) test at 0.05 level of significance. Results showed that there was significant main effect of cartoon on the academic achievement of pupil's in Mathematics. It was recommended among others that Mathematics teachers should incorporate the use of cartoon into the teaching and learning of Mathematics in order to enhance students' academic achievement in Mathematics.

Keywords: Cartoon, Gender, Mathematics Achievement.

Introduction

Its a busy world for both parents, both are in the labour market and each has to contribute their quarter to the family's purse. Mothers work full time and are not too available. Parents look for ways of keeping their wards busy in order to reduce intrusion of external bodies to come stay with them and somehow the use of technology is engaged. Children are introduced to the watching of television at a very early stage of their life, through it they are entertained and occupied. Most children are introduced to cartoon watching as early as ages five to six months and by ages two to three years they are trained to developed interest in watching cartoons to the extents that they become addicted viewers which becomes problematic not only because they watch cartoon but because they watch too much television not taking into cognizance it negative impact both mentally and emotionally couple with brain and eye injuries and other risk involved with television

watching. Mathematics is a subject offered by children from pre nursery school up to the secondary school and sometimes even to the university level. Mathematics as a school subject, it is being perceived to be too abstract in nature and difficult to copy with. Most student have this preconceived notion right from their early years and this in turn affects their achievement, the situation that has prompted investigations into different strategies that could enhance student achievement in Mathematics. This study sought to establish if the use of cartoon in instruction would improve pupils achievement with the moderating effect of gender being also investigated.

Communicating with cartoon is an easy communication which isn't complicated. Shazia, *et al* (2017) said cartoons are often expressive, comedic, political, cultural, religious, scientific etc. Cevat & Oğuzhan (2014) expressed cartoons to be effective tools which are used in order to teach and advise in addition they are funny. Cartoons can be easily detected by children. Micheal & Wyk (2011) said cartoons are methods that can be used to support teaching in class or outside of class. They stated that cartoons might support teaching in constructive learning, contextual learning, social skills, collaborative learning, critical thinking and small group learning. Cartoon frequently incorporate humour, which is another source of student motivation. Humour helps pupils' get into a positive emotional state, which leads to greater engagement and learning. Using a humorous "bit" is a great way to liven up a lesson. This can be a funny story, purposely crafted unit of humour. Properly adding humorous bits to your lessons can increase student retention of material, lead to higher student results on test and create more student engagement. It could also make some particular points memorable and this helps pupil's break their prejudice (Doring, 2010). According to Efe (2004), a teacher who knows cartoon and can use the best save today's youth from the cartoons which are distasteful, and only include elements of humor.

Cevat & Oğuzhan (2014) said no tool can make teaching as interesting as a cartoon. They further said cartoon visual aids motivates the pupils and creates the opportunity to discussion. Türkmen (2012) stated that cartoons are a door which opens to imaginary world from the real world and explained that children can fictionalize themselves in this realm freely and transfer what they learn or see in this world they entered the real life, and it is possible to shape the children and, in a sense, their way of life through the world of cartoons. Doring (2002) supported the use of cartoons in class and stated that they prevent students' destructive behaviors, ease boredom and increases the amount of interest and connection, therefore helping build a positive learning environment. He added that using cartoons is very useful for eliminating the contradiction between perception and reality because phenomena and events are generally exaggerated to succeed in the explaining action. Macgillivray (2011) stated that cartoons helps students determine and analyze prejudiced behaviors, phenomena and events. Özalp (2006) acclaimed that cartoon helps students to think in creative and critical manner. Uslu (2007) opined that cartoon improves students' critical thinking and problem solving skills and they also allow them to express

themselves, think freely, imagine, tell their thoughts and feelings orally and in writing. Mc Morris & Lin (2009) also established that cartoon can grab the attention of the pupils' by making them healthy and interested in learning. Cartoon stimulates students to engage in critical thinking in order to assess and formulate their views and opinions. Barak *et al* (2011) verified that cartoon developed students thinking skills, information understanding, applying and judging skills, their level of contacting with daily life and apprehending its importance for future. Guastello (2009) asserted that cartoon assist pupil's to build scenarios for understanding a lesson's concepts. Mayer (2011) attested that cartoon provides the needed structure that allows learners to effectively select, organize and integrate new information. Cartoon develop motivation, understanding, retention of concepts, as well as discovery potentials among learners. It reduces the cognitive load on learning new material because learners "attentions are directed to the significant elements in a topic and away from items of less importance".

Cevat & Oğuzhan (2014) validated that the teaching done by using cartoon provided significant differences in increasing students' academic achievement and increases the level of knowledge retention. Brandenburg *et al* (2009) substantiated that cartoons were an effective way to encourage students to discuss the advantages and disadvantages of their preferred strategies for solving addition problem and to find out how students approach the calculation. Toh (2009) found out that student motivation was increased in algebra lessons when cartoon was used. Sexton (2010) discovered that cartoons provided students an opportunity to reflect their perceptions of effective Mathematics learning environments, and that more than half of the students indicated that they preferred a constructivist approach. Mahsud *et al* (2009) authenticated that male and female viewers have different preferences and even different behavior change and that both male and female children spent almost equal time watching cartoons. In the light of the above, the study sought to investigate the impact of learning Mathematics using cartoon as well as the moderating roles of gender on participants' achievement in Mathematics.

The following hypotheses were tested in this study

1. There is no significant main effect of cartoon on the academic achievement of pupil's in Mathematics.
2. There is no significant main effect of gender on the academic achievement of pupil's in Mathematics.
3. There is no significant interaction effect of cartoon and gender on the academic achievement of pupils' in Mathematics.

Methodology

This study adopted a pre-test, post-test, control group quasi experimental design. The population consisted of all private, co-educational, primary two pupils' in Ijebu-Ode Local Government Area of Ogun state. The sample for the study comprised of one hundred and ninety private co-educational primary two pupils' from four schools in Ijebu-Ode

Local Government Area of Ogun State. A purposive sampling technique was used to select the four schools used. In order to reduce interaction that could possibly occur among the groups, schools were selected from different locations in Ijebu-Ode, in each of the selected school, intact classes were used. Three instrument were used for the study, two procedural instruments and one measurement instrument. The procedural instruments included cartoon instructional guide and conventional instructional guide. Cartoon videos clips were downloaded on basic Mathematics for addition, subtraction, multiplication and differentiating between big and small objects and these video clips along with an instructional guide were adopted for the study. Conventional method instructional guide presented the step by step procedure in a lecture method class. While the Mathematics Achievement Test (MAT) was the measurement instrument used. The Mathematics Achievement Test (MAT) was a multiple choice questions with options.

Results

Hypothesis one:

There is no significant main effect of cartoon on the academic achievement of pupil's in Mathematics.

Table 1: ANCOVA analysis of the effect of cartoon on pupil's academic achievement in Mathematics.

Dependent Variable: post-test

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	451.899 ^a	8	56.487	9.402	.000	.467
Intercept	1188.529	1	1188.529	197.824	.000	.697
Pretest	394.967	1	394.967	65.740	.000	.433
Treatment	82.021	3	27.340	4.551	.005	.137
Gender	7.695	1	7.695	1.281	.261	.015
treatment * gender	54.901	3	18.300	3.046	.033	.096
Error	516.690	86	6.008			
Total	39692.000	95				
Corrected Total	968.589	94				

a. R Squared = .467 (Adjusted R Squared = .417)

The result from table 1 indicated that there is an overall statistical effects of treatment on the performance of pupil's in Mathematics, $F_{(8,86)} = 9.402$, $p < 0.05$.

Table 2: Levene's Test of Equality of Error Variance

Dependent Variable: post-test

F	df ₁	df ₂	Sig.
1.591	7	87	.149

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

- a. Design: Intercept + pretest + treatment + gender + treatment * gender

The result from table 2 indicated that $0.149 > 0.05$ hence, there is significant difference in the pupil performance after been exposed to the treatment, It can be seen that their performance is significant from that of pre-test in table 1. That is, the post-test achievement scores of the pupil's exposed to the different instructional strategies are significantly different. As a result, it is concluded that there is significant main effect on the academic achievement of pupil's after been exposed to the instructional processes.

Hypothesis two:

There is no significant main effect of gender on the academic achievement of pupil's in Mathematics.

Table 3: Summary of analysis of covariance on pupils' achievement score according to gender

Table 3: Descriptive Statistics

Dependent Variable: post-test

Treatment	Gender	Mean	Std. Deviation	N
School I	Male	18.70	2.214	10
	Female	20.33	1.877	15
	Total	19.68	2.135	25
School II	Male	19.70	2.003	10
	Female	20.33	1.988	15
	Total	20.08	1.977	25
School III	Male	22.12	2.642	8
	Female	20.41	6.215	17
	Total	20.96	5.334	25
School IV	Male	19.89	2.147	9
	Female	20.09	1.514	11
	Total	20.00	1.777	20
Total	Male	20.00	2.472	37
	Female	20.31	3.619	58
	Total	20.19	3.210	95

The table 1 shows that there is no significant effect of gender on the pupils' academic performance, $F_{(1,86)} = 1.281, 0.261 > p$. The result of the main effect of gender in table 1 on pupil's academic scores revealed that there is no significant effect of gender on pupils achievement score in Mathematics. The result obtained in table 3 implied that the post-test mean achievement scores of male and female pupil's that were exposed to different procedural presentation are not significantly different. However, this outcome implies that the female pupil's recorded better achievement scores than that of male across all the schools used in this study. Although the obtained difference in post-test mean achievement scores was not statistically significant.

Hypothesis Three

There is no significant interaction effect of cartoon and gender on the academic achievement of pupils' in Mathematics.

The table 1 shows the interaction of treatment and gender that no statistical difference in performance, $F_{(3,86)} = 3.046, 0.033 > p$ at 0.05 level of significance. The interaction effect of treatment show no statistical difference, $F_{(3,86)} = 4.551, 0.005 > p$. It can also be seen in the pretest score that there is no significance difference in the pupil's pretest performance score at 0.05 level of significance, $F_{(1,86)} = 65.740, 0.00 > p$. The table 3 further gives a confirmation that there is no statistical difference in the mean score performance of male and female pupil's in two schools out of the four used in this study. School I and school II has no significant difference in the mean score of the female pupil's $20.33 > p$ and different of 1.0 in the mean score of the male pupil's, but have the same number of N in the descriptive statistics.

Summary of findings

The major findings in this study are summarized as follows:

1. There was significant main effect of cartoon on the academic achievement of pupil's in Mathematics.
2. There was no significant main effect of gender on the academic achievement of pupil's in Mathematics.
3. There was no significant interaction effect of cartoon and gender on the academic achievement of pupil's in Mathematics.

Discussions

The study was designed to examine whether the use of cartoon are in anyway more effective than the conventional method used in the teaching of Mathematics and also to investigate how gender interacted with the strategy as it influence pupils achievement. The findings of the study revealed that there was significant main effect of cartoon on the academic achievement of pupil's in Mathematics. It was observed that there was improvement in pupils' achievement after receiving this instructional strategy. This finding

corroborates with the assertion of Cevat & Oğuzhan (2014), that the teaching done with cartoons affects students' achievements and knowledge retention positively. This finding agrees with Toh (2009) who explored and found out that student motivation was increased in algebra lessons when cartoon was used. The finding also corroborate with Sexton (2010) that discovered that students' taught with cartoons are provided with the opportunity of reflecting their perceptions of effective Mathematics learning environments, and that more than half of the students indicated that they preferred a constructivist approach. The findings also agrees with the result of Brandenberg *et al* (2009) they reported that students taught with cartoons discovered their preferred strategies for solving addition problem and find out how to approach calculation. Doring (2002) supported the use of cartoons in class and stated that they prevent students' destructive behaviors, ease boredom and increases the amount of interest and connection, therefore helping build a positive learning environment. By implication therefore when the need arises to consider the most effective strategy to be used in teaching Mathematics, cartoon could be considered the effective because it is an effective tools which are used in order to teach and advise in addition they are funny and sustain pupils interest.

The result of the main effect of gender revealed no significant main effect of gender on the pupils' achievement scores in Mathematics. The result implied that the post-test mean achievement scores of male and female pupil's that were exposed to different procedural presentation are not significantly different. However, this outcome implies that the female pupil's recorded better achievement scores than that of male across all the schools used in this study. Although the obtained difference in post-test mean achievement scores was not statistically significant.

The result of the 2-way interaction effect of treatment and gender revealed there was no significant interaction effect of cartoon and gender on the academic achievement of pupil's in Mathematics. This result also supports Mahsud *et al* (2009) findings that male and female viewers have different preferences and that both male and female children spent almost equal time watching cartoons

Recommendations

Based on the findings of this study, it was recommended that teachers should be encouraged to incorporating cartoon into the teaching of Mathematics to enhance pupils achievement and increase interest, attitude and retention of learners'. More educational cartoon especially the ones that are mathematically based should be developed and encouraged for usage in the teaching learning process

References

- Barak M, Ashkar T & Dori YJ (2011). Learning science via animated movies: Its effect on students' thinking and motivation. *Computers Education*. 56(3),839-846.
- Brandenburg, R., Gervasoni, A., & Sexton, M. (2009). Using a concept cartoon to gain insight into children's calculation strategies. *Australian Primary Mathematics Classroom*, 14(4), 24-28.
- Cevat Eker & Oğuzhan Karadeniz (2014). The Effects of Educational Practice with Cartoons on Learning Outcomes. *International Journal of Humanities and Social Science*. 4(14)
- Doring A (2002). The use of cartoons as a teaching and learning strategy with adult learners. *New Zealand J. Adult Learn.* 30(1), 56- 62.
- Efe, H. (2004). Karikatür ve Popüler Kültür Soruşturması. *Bilim ve Aklın Aydınlığında Eğitim Dergisi*, 57.
- Guastello, S. J. (2009). Evolutionary game theory and leadership. *American psychologist*. 64(1), 53-54.
- Macgillivray L. K (2011). Using cartoons to teach students about stereotypes and discrimination: one teacher's lessons from south park. *Journal of Curriculum and Pedagogy*. 2(1), 133- 147
- Mashud. M. N., Rawan, B., & Yasir, N., (2009). The Effect of Cartoon Network on the Aggressive Behavior of School Going Children. *Global Media Journal, Allama Iqbal University, Islamabad*. 1.
- Mayer, R. E. (2011). *Applying the science of learning*. Upper Saddle River, NJ: Pearson
- Mc Morris & Lin (2009). Protective factor for students' academic success, particularly for those who exhibit behavioral.
- Özalp, I. (2006). Karikatür Tekniğinin Fen ve Çevre Eğitiminde Kullanılabilirliği Üzerine Bir Araştırma. Yayınlanmamış yüksek lisans tezi, Celal Bayar Üniversitesi, Manisa.
- Özer, A. (2005). Karikatür eğitimcinin yazı tahtası üzerindeki işini fazlasıyla kolaylaştırır. *Hürriyet gösteri sanat edebiyat dergisi*, 73.

Sexton, M. (2010). Using concept cartoons to access students' belief about preferred approaches to mathematics learning environments. *MERGA33-2010: Shaping the Future of Mathematics Education*. 515-522.

Shazia Akbar Ghilzai¹, Rabia Alam, Zubair Ahmad, Amina Shaukat & Syeda Shahum Noor (2017). Impact of Cartoon Programs on Children's Language and Behavior. *Insights in Language Society and Culture*. 2, 104-126.
www.sienajournals.com

Toh, T. L. (2009). Use of cartoons and comics to teach algebra in mathematics classrooms.

Türkmen N (2012). Carton film's cultural role in the transmission and Pepe. Cumhuriyet University. *The Social Science Journal*. 36(2).

Uslu, H. (2007). Eğitimde Karikatür. *Bilim ve Aklın Aydınlığında Eğitim*. 84(7), 15-18.
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<http://baae.meb.gov.tr/index.php/joomlaorg/viewcategory/8-2007>.

Wyk V, & Micheal M (2011). The use of cartoons as a teaching tool to enhance student learning in economics education. *The Social Science Journal*. 26(2), 117-130