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Impact of AVMs on Learning: Disadvantaged Learner Perspective in Bangladesh

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Abstract:

The art of teaching-learning in education have been changing in association with digital technologies. In recent years, formal primary schools as well as nonformal primary schools have started to conduct their teaching-learning activities by using digital materials to tap with the flow of technology enrichment. The objective of this paper was examining impact of audio visual materials (AVM) on learning of nonformal primary school learners. Quasi experimental (pre & post) research design was used to conduct the study. Therefore, this study administered quantitative approach to explore the perception of students considering the impact of intervention. Purposive & convenient sampling techniques have been followed in sample selection. Two groups of students of Grade IV were the sample. Students' achievement test was used as tool. This study recognized that AVMs had significant impact on students' learning in the context of creating motivation, testing prior knowledge, ensuring active participation in the classroom. Finally the study recommended that professional training for teachers is required for effective pedagogy with AVMs in classroom practices in nonformal primary schools in Bangladesh.

Key Words:

AVMs, Nonformal Primary School, Students' Perception.

1. Introduction

Technology added innovative mechanism to the teaching learning process by replacing digital learning materials in lieu of traditional teaching aids in the classroom activities. The 21st century accentuated more education institutions to modernize its systems and practices to make the conventional ways of teaching learning as innovative practices. These kind of pedagogical practices are considered as concepts of knowledge based society which is emerging pedagogy for 21st century skills (Ottestad, 2010). By the course of time, different techniques and materials

are incorporated in classroom teaching including AVMs for effective learning. AMVs increased learning the pace of learning opportunities especially in nonformal education and support teachers to analyze the contents. In Bangladesh, along with government initiatives, the national and international Non-Government Organizations (NGOs) are also providing technical support to use digital materials in nonformal schools. However, there were found a limited study on impact of AVMs on learning. Thus, the study was conducted to identify impact of AVMs on learning of nonformal context. In this study, researchers self-developed AVMs targeted to specific lessons of text book were used for the examination of the impact by assessing the learning outcome of the students in accordance with National Curriculum and Text Book Board (NCTB) primary level competencies.

2. What Literature Says

The sense organs are the medium that contributes in people's learning and understanding of the environment and thus leads them to the way of knowledge. In a school environment, knowledge is acquired through ears and eyes in most cases. AVMs are the materials that stimulate learning by simulating the real situation using objects, pictures and motion graphics before students. AVM is defined by Rather (2004) as the instructional material mostly used in classroom teaching learning activities in order to make the learning interesting and easier. Literally the word 'Audio' means "something related to hearing" and "visual" means something which is related to vision or seeing. Briefly, materials which help to clear the concept through senses are called AVMs. Charts, diagrams, maps, blocks, models, film, motion graph, projectors radio and television are commonly used AVMs which are also called as instructional materials. However, these materials used in classroom teaching for giving students hands on experience and make the learning near about to real acquaintance. Worldwide research has shown that digital communication technology can lead to improve students' learning and better teaching methods. Regarding the issue Swank (2011) reported that the estimated percentage of visual experience related to concept is about 40% and 25% upon auditory whereas rest of 35% is upon tactile, taste smell and other organic sensation. The book of Edgar Dale (1969) "*Audio visual Methods in Teaching*", suggested about "cone of experience" to give more credit to visual learning shown in figure 1:

Cone of Experience

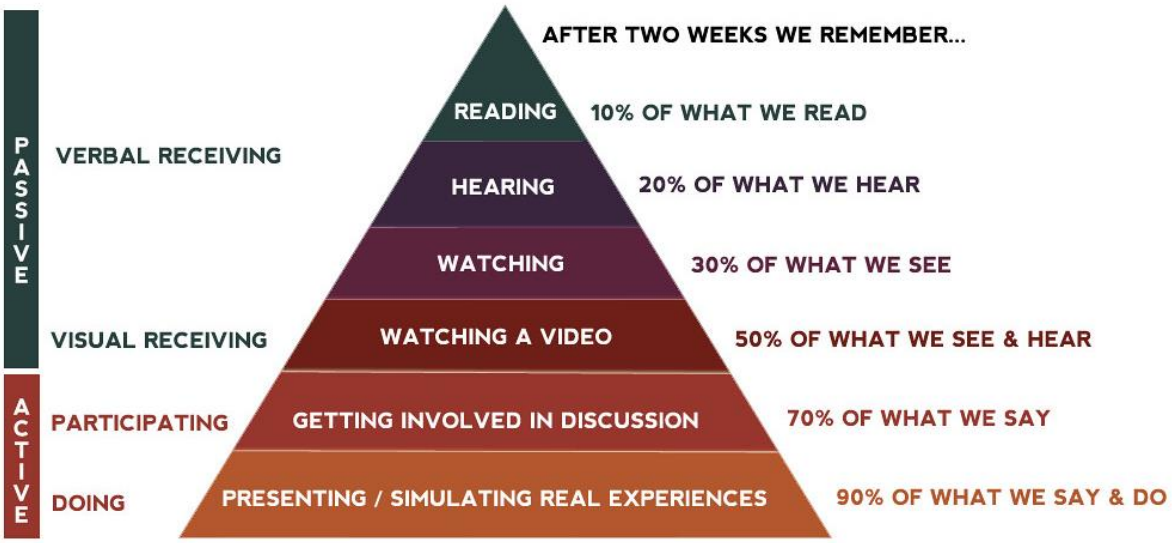

Figure1: Cone of Experience by Edgar Dale

Note: Above graphic was derived from Metiri Group (2008) which represents a new formation of Dale's model with percentage, as Dale's original "cone of experience" does not contain any percentages.

There are different types of AVMs are used all over the world. Broadly AVMs are three types: Auditory Material which is to the hearing, Visual Material (VM) which we see and can be seen and understood by observing the visual aspect of any objects and the AVMs are the combination of Auditory and VMs. Based on the secondary literature, researchers modified these three categories of AVMs include some more materials as in figure 2:

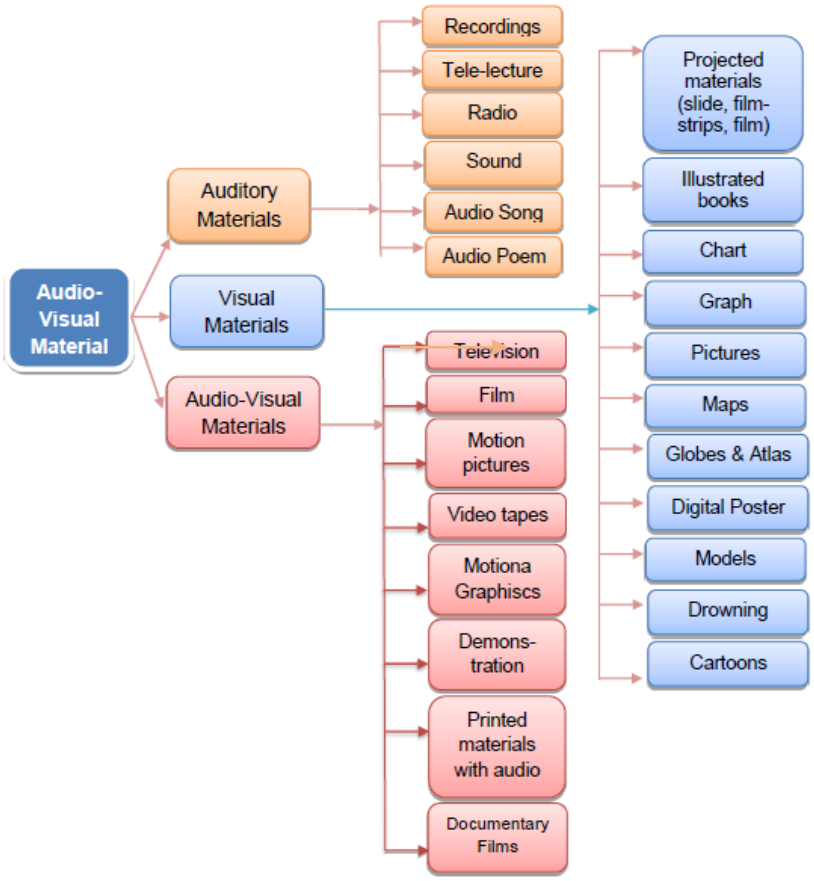

Figure 2: Different types of AVMs

Various kinds of teaching materials can positively improve learning because of the stimulation of learners attention is significantly focused during teaching-learning activities in the classroom. AVMs can enhance the learning through joyful learning environment and encouraging for deep understanding of the topic. Connecting with this Jarosievitz (2015) discussed about the flipped classroom that incorporate the blended mode of teaching learning using online resources and motivate learners towards audio visual learning materials. In another study by Malik and Agarwal (2012) have recognized AVMs as a constructivist learning tools, allows students to pursue and go in for their learning. Further study conducted by De Sousa and Van Eeden (2009) found the significance of AVMs in teaching learning regarding active participation and enabling in-depth understanding of contents. Thenceforth, AVMs is described one of the effective instrument to transform teaching learning practices to purely student-centered ensuring active learning for all students in the classroom. These tools are also significantly considered for providing on students' easy and clear understanding. Furthermore, it also increased learners' critical thinking and problem solving ability which recognized by Shah and Khan (2015) that graphical presentations as well as onscreen materials fit out a better learning experience rather than printed materials in order to develop critical thinking ability.

Bangladesh, as a developing and middle-income country government intends to extend the advantage of Information and Communication Technology (ICT) especially digital materials in education process at every level (National Education Policy, 2010). Along with government schools, there are significant national & international NGOs working in the field of nonformal primary education of Bangladesh. However, nonformal education process being a comparatively flexible system and is operated to meet the basic learning needs of underprivileged group and it is availed at any age yet the main target group of this education is the group of children who have never went to school or being dropped out from formal school. In this flexible arena, it always feels challenging to retain learner in schooling system. So the teaching-learning process and materials used in their teaching is somewhat different in nature in order to make the learning environment easy and enjoyable. In this circumstance, digital materials specifically AVMs can contribute more to hold the learner in the classroom and make the learning activities more active and permanent. In connection to this issue, Eze (2013) argued that humans learn easily and in the shortest period of time by audio visual processes as compared to verbal explanations solely. Martin (2009) identified another significant factor that AVMs in the learning environment can be used to motivate the learners.

3. Objectives of the study

The prime objective of this study was to identify the impact of using AVMs on learning of Nonformal Primary School students. The specific objectives of the study were to:

- test the influence of AVMs on students' achievement
- explore the applicability of using AVM in nonformal primary school from pedagogical point of view

3.1 Hypothesis

The hypotheses of this study were as following:

H_{01}: There is no significant difference between achievement scores of control and experimental group using AVMs

H_{02}: There is no significant difference between the achievement scores of pre and post-test of experimental group

4. Methodology

The nature of the study was Quasi Experimental (pre and post-test) design to justify the cause and effect relationship between two variables (AV intervention and students' achievement

score). Students of Grade IV in a nonformal primary school operated by JAAGO Foundation were purposively selected as the sample of this study. Two classes (Section 'A'&'B') were selected where 'Section A' was 'Control Group' (CG) and 'Section B' was 'Experimental Group' (EG). Data were collected by using achievement test (pre and post-test) and structured interview. However, this study confirmed all possible ethical considerations and proper consent from the participants.

5. Major Findings

Hypothetical Test (H_{01})

The first hypothesis of the study was to determine whether there was any significant differences between the achievement mean of the pre-tests and post-tests' score of control and experimental groups

H01: There is no significant difference between achievement test scores of control and experimental group regarding the use of AVMs.

5.1 Analysis of Achievement Mean Score

According to the figure 3, data recognized that the range of the difference in mean score between two groups in pre-test was least but after intervention experimental group scored better than that of control group. Consequently, identified range of the difference in mean score between experimental and control groups was higher in post-test score comparing pre-test. Thus, data affirmed that there was a significance difference using AVMs between achievements mean score of experimental and control group.

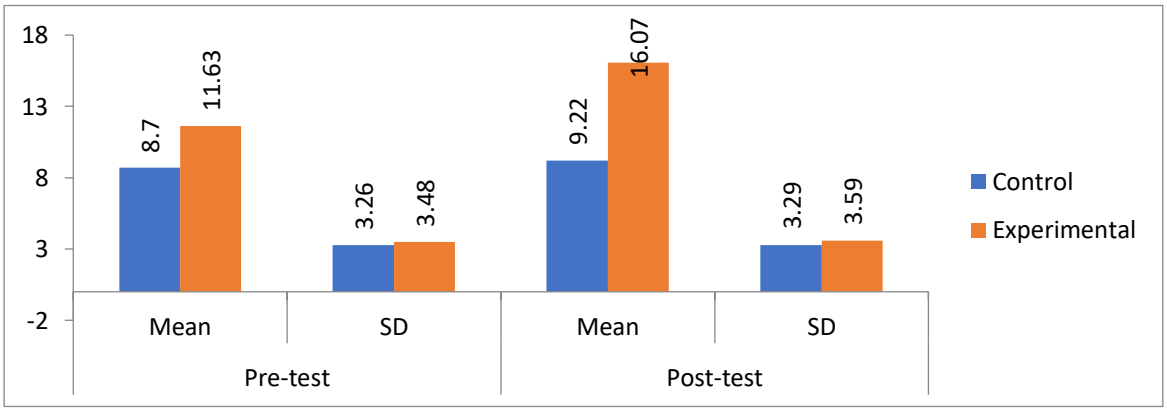

Figure 3: Achievement Mean score and Standard Deviation of learners

The result mentioned in table 1 revealed that there was found a significant difference between achievement mean score of experimental group and control group considering the influence of AVMs on learning. From the above table the calculated t value is-7.311. For t-value -7.311 and 52 degrees of freedom, the p value is .000 which is less than 0.05 (p=<.05). The test result clearly confirmed that, at 95% level of confidence interval, the Null hypothesis H_{01} (There is no significant difference between achievements score of control and experimental group) had been rejected. So the alternative hypothesis had been accepted which indicated significant difference between achievement mean score of control and experimental group.

Table 1: Achievements mean scores of CG &EG (t-test)

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Post-test	Equal variances assumed	1.292	.261	-7.311	52	.000
	Equal variances not assumed			-7.311	51.587	.000

5.2 Gender wise Analysis

The data stated in figure 4, clearly identified that the rate of girls' improvement was higher than that of boys for control and experimental groups regarding post-test score which acknowledged impact of AVMs in girls' achievement than boys'.

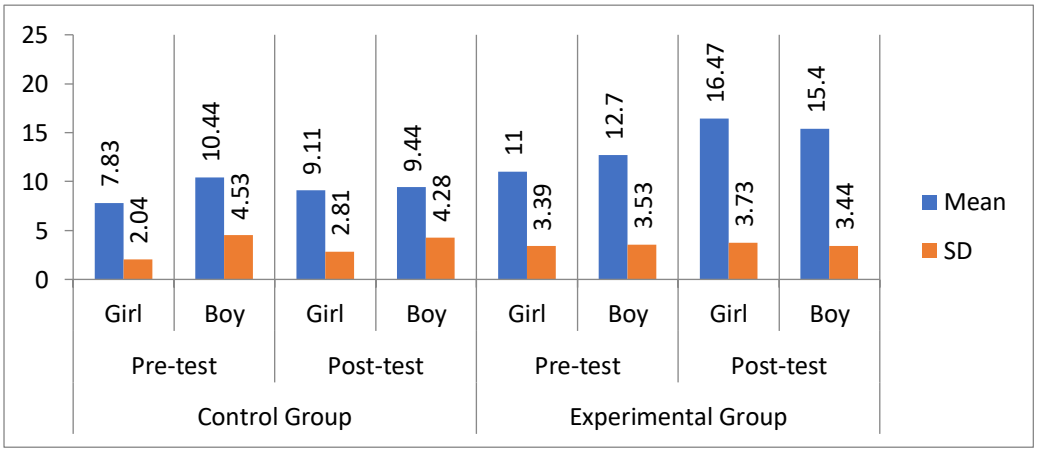

Figure 4: Gender wise analysis of achievement score

5.3 Domain wise Analysis

The mentioned table 2 indicated that students of experimental group showed improved performance in post-test regarding knowledge & comprehension item as they scored less than control group in pre-test. Though control group scored better in post-test than pre-test regarding knowledge, comprehension and psychomotor based items but the range was very low comparing that of experimental group and surprisingly control group scored less regarding post-test than pre-test in application and analysis based item. But students' performance of experimental group in post-test was considerably higher than that of pre-test comparing the performance of control group in every question item which indicated that the intervention using AVMs had significant impact on their achievement. More significantly, the intervention helped students to increase their creative skills regarding cognitive and psychomotor skills.

Table 2: Domain wise analysis of achievement test

	Question Item	**Pre-test**				**Post-test**			
		Control		**Experimental**		**Control**		**Experimental**	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
Cognitive	Knowledge	0.85	0.53	0.78	0.50	1.22	0.80	1.33	0.78
	Understanding/ Comprehension	0.22	0.51	0.19	0.40	0.37	0.57	1.07	0.62
	Application & Analysis	1.19	0.88	1.81	1.00	0.85	0.91	2.00	1.39
Psychomotor		0.19	0.40	1.00	0.78	0.44	0.70	1.19	0.88

Hypothetical Test (H_{02})

Second hypothesis of the study was to determine whether there was any significant differences between the means of the achievement pre and post-tests' score of the experimental group.

H_{02}: There is no significant difference between achievement scores of pre and post-test of experiment group

5.4 Analysis of Achievement Mean Score

The data in table 3 clearly assured significant differences in achievements mean score of pre & post-test of experimental group after using AVMs as intervention.

Table 3: Achievements mean scores of EG

Experimental Group		
Score Type	**Mean**	**Std. Deviation**
Pre-test	11.63	3.48
Post-test	16.07	3.59

The paired sample t-test mentioned in table-4 revealed the significant difference between achievements mean score of pre and post-test of experimental group. From the above table calculated t value is – 8.792.For t-value – 7.311 and 26 degrees of freedom, the p value is .000 which is less than 0.05 (p=<.05).Thus, the test result clearly confirmed that, at 95% level of confidence interval, the Null hypothesis H_{02} (There is no significant difference between the achievements mean score of pre and post-test of experiment group) had been rejected. By this t-test the alternative hypothesis had been accepted which indicated significant difference between achievements mean score pre & post-test of experimental group.

Table- 4: Significant differences between achievements mean score (t-test)

Score Type	**Paired Differences**		**t-test for Equality of Means**		
	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pre-test & Post-test	-4.444	2.792	-8.272	26	.000

5.5 Correlation between AVM and Achievement Scores

The table 5 of correlations showed that the value of 'r' is .712 that means there was a strong positive relationship between the two variables (r = .712 > 0.7). Because, the formula of Pearson correlation stated that if the r value crosses .7 then the correlation will be positively strong. Thus, data indicated strong positive relationship between the intervention and achievement score of experimental group regarding AVMs.

Table 5: Significant Correlation between AVM and Achievement Score of EG

Correlations			
		Intervention	Post-test score
Intervention using AVM	Pearson Correlation	1	.712**
	Sig. (2-tailed)		.000
Post-test total Score	Pearson Correlation	.712**	1
	Sig. (2-tailed)	.000	
**. Correlation is significant at the 0.05 level (2-tailed).			

5.6 Gender wise Analysis

On the basis of gender, data table 6 indicated that audio visual intervention was more effective for girls than boys regarding post-test achievement score.

Table 6: Gender wise analysis of achievement score of EG

	Experimental Group			
	Pre-test		Post-test	
	Girl	**Boy**	**Girl**	**Boy**
Mean	11	12.7	16.47	15.4
SD	3.39	3.53	3.73	3.44

5.7 Domain wise Analysis

Data of the table 7 identified that the students of experimental group improved their understanding after the intervention period and more significantly found that using AVMs in teaching-learning helped students to increase their creative skills regarding cognitive and psychomotor skills.

Table 7: Domain wise analysis of achievement score of EG

	Question Items	**Pre-test**		**Post-test**	
		Mean	**SD**	**Mean**	**SD**
Cognitive	Knowledge	0.78	0.50	1.33	0.78
	Understanding/ Comprehension	0.19	0.40	1.07	0.62
	Application & Analysis	1.81	1.00	2.00	1.39
Psychomotor		1.00	0.78	1.19	0.88

6. Students' Perception towards AVMs

Data represented in the figure 5 claimed that major portion of the students had positive perception towards using AVMs in teaching-learning of BGS subject. Significant number of students agreed that AVM is an effective tool for content understanding whereas less significant portion disagreed to this.

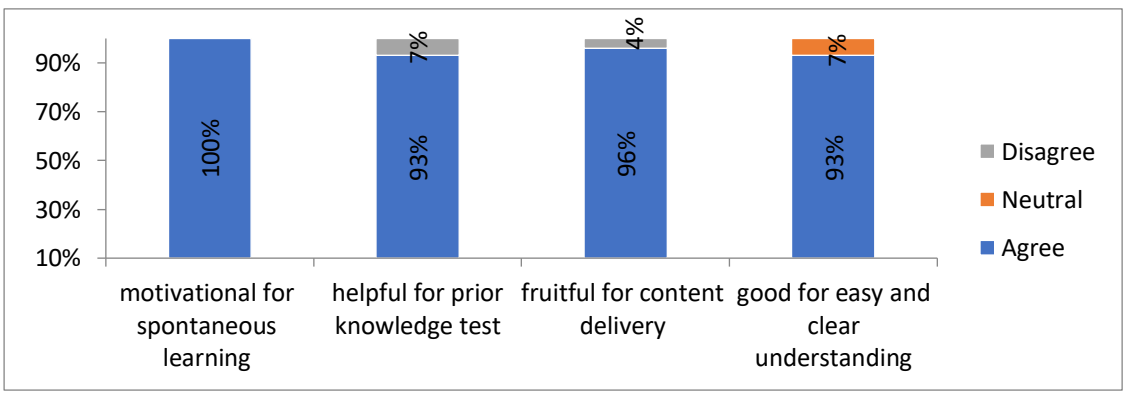

Figure 5: Effect on content understanding

The figure 6 indicated that almost all students and in some cases more than three-fourth of all students perceived AVMs positively as effective tool for active learning in the classroom especially for BGS class whereas less than one-fourth disagreed with this.

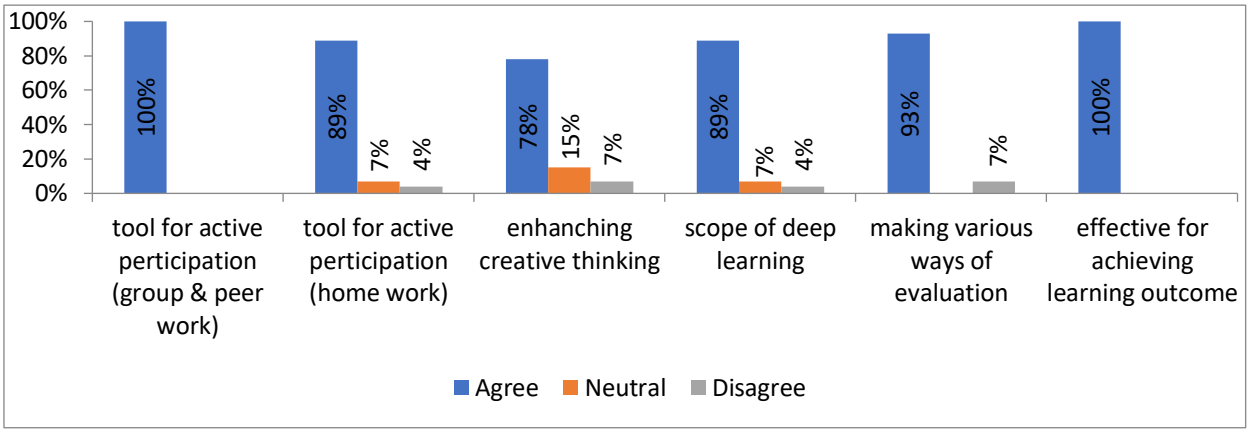

Figure 6: Effect on Active Learning

Data in figure 7 disclosed that majority of all students rejected the negative statement regarding AVMs and they perceived the intervention as educational aids rather than disturbing and time consuming tool whereas very minor portion of the students agreed that AVM is time consuming.

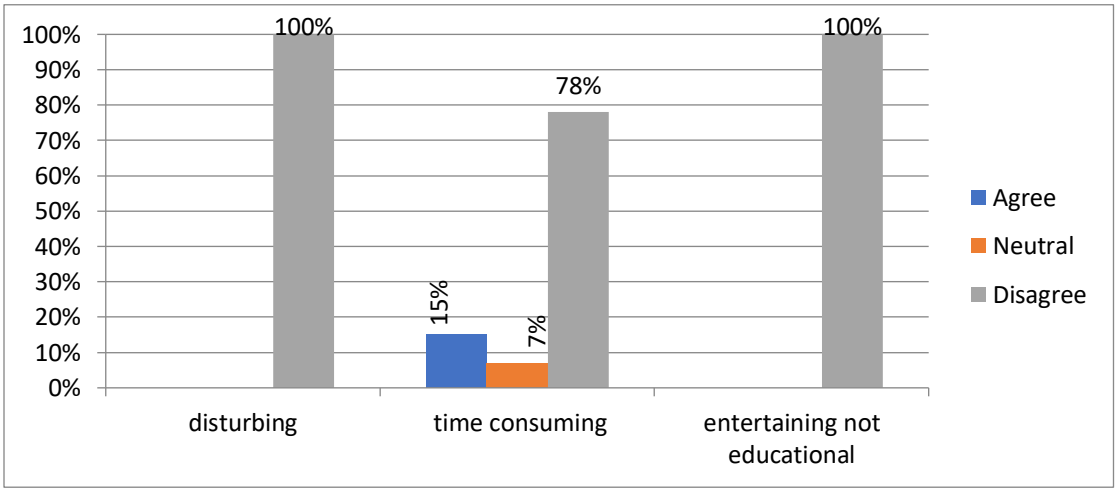

Figure 7: Perception on negative effect

Although, all data disclosed that majority of the students' perception towards AVMs was positive, it is too difficult to claim that only AVMs contribute to achieve the better performance

of experimental group but there could be contributed some other factors as like teacher's delivery of lesson, learning environment, topic of the lesson and students' self-motivation.

7. Discussions and Conclusion

Presence of new dimensions of advanced technology in teaching-learning system has enlarged opportunity of teaching beyond classrooms and traditional methods. This study revealed that use of AVM in classroom teaching-learning activities, increases the interaction between students-teacher, students-students and students-content which is greatly supportive to achieve the learning outcome. A study by Ashaver & Igyuve (2013) significantly found that using audio visual method in classroom teaching-learning benefits the teachers more rather than using conventional teaching techniques (e.g. lecture, discussion, question-answer) in terms of getting students' attention and confirming their active participation in different forms (e. g. peer work, group work) in the classroom. The data also indicated that AVM is helpful for the teachers in context of effective classroom management which is supported by the study of Gilakjani (2012) where identified the AVM is effective in strengthening teaching with graphical and visual presentation for acquiring higher order thinking skills of learner. According to GSCI Strategic Plan (2009), it is affecting the student-teacher relationship, quality of teaching-learning activities as well as educational administration and management.

The data of this study claimed that AVMs in classroom teaching-learning have positive impact on students' learning due to the significant scope for students' prior knowledge test, joyful active participation through peer work, group work, home-work, scope for deep learning, easy and clear understanding of the topic. A study conducted by Kunari (2006) stated that AVMs as a functional tool in order to enhance lesson plan as well as an effective way to give students more information about lesson topic. The study also disclosed that AVMs are fruitful aid to escalate students' motivation to the study, increasing critical thinking ability; creativity and imagination skills. In this connection, Mishra & Yadav (2004) claimed that diverse presentation is possible by using AVMs.

The study also identified some major challenges for effective conduction of AVMs in teaching learning activities though these are found significant and impactful on learning. Mostly, the challenges are found related to infrastructural limitations, insufficient spaces for all students in the classroom or lab, difficulties in clear sound system, and poor projection system. Nevertheless sometimes it seems entertaining to a portion of the students in the classroom and then it values nothing pedagogically. Expert remarks stated that too much use of audio visual

aids, such as with presentations, removes the learning experience from the classroom and can risk students' active leaning.

Although the benefits of using AVMs in the classroom teaching learning process identified in research, constraints and drawbacks associated with its use still exist. As Frederick, Schweizer and Lowe (2006) denoted that, dynamism, special needs and disquiet of students over standardized test results are found as the main challenges regarding the use of AVMs. However, in order to minimize the constraint and challenges of using AVMs, a team of Indira Gandhi National Open University (2010), presented the model of "7 Rs of audio visual aids" (in figure 8).

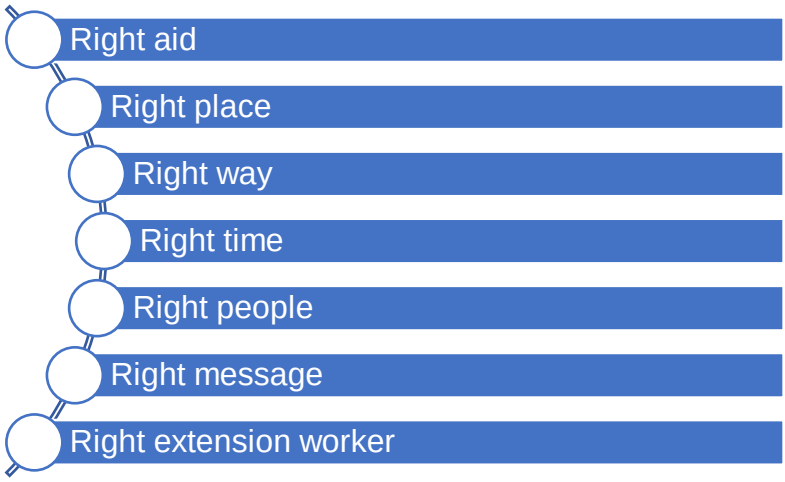

Figure 8: 7 Rs of audio visual aids

Based on the findings, it can claim that AVMs facilitate teaching-learning activities effectively by fighting the boredom that learners faced as long as they are in learning situation. Ordinarily, the findings deploy the pragmatic perception to the impact of AVMs on learning of nonformal primary school setting that resulted in identifying the specific interruption to fruitfully utilize AVMs. It is suggested that teachers could develop AVMs by her/him-self and the materials should undergo a review to ensure appropriateness.

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