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Learning Styles: Tools for Understanding Media Selection and Learners' Academic Achievement in Physics

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ABSTRACT

The study examined learners' learning styles and media format on academic achievement among physics distance learners. Two hundred and Ninety-five learners were used for the study and were selected through purposive sampling techniques by balloting. Fleming NARK model Index of Learning Style questionnaire (ILSQ) and PAT Physics Achievement Test with reliability coefficient of 0.88 and 0.78 using test-retest method and KR-21. The two instruments were used for data collection. Data collected were analyzed using Analysis of Covariance (ANCOVA). The results showed that no significant difference exists in the achievement of learners with varied learning styles (visual, auditory and kinesthetic) when taught using print format, audio and audio visual. However, results indicated that Kinesthetic is the most effective learning style when learners were taught with audiovisual media format which significantly influences learners' achievement. The study recommends that there is need for teachers to diversify their strategy to compliments all types of learners.

1. Introduction

Teaching is a process of engaging learners in order for them to understand and apply the acquired knowledge, concepts and processes to solve life situation and problems which they will be confronted with and eventually realized a civilized community (Ali, 2009). The content of what the teacher transmit to learners in physics is dependent on the learning resources put together and the mode of dissemination for effective learning to take place (Murundu, Okwara, Otienoh & Murundu, 2017). Physics has always perceived by students as abstract and difficult to understand. These had made students' academic achievement in the subject to be relatively poor (Fanuel Wesonga & Aurah, C, 2019).

For objectives of the subject to be realized, physics should be taught using adequate instructional strategies. For improved performance and implementation

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of learning activities in physics, there is need for physics teachers to support learners in gaining appropriate knowledge and practice desired skills. This could be achieved by using adequate learning facilities to improve the quality of teaching the teacher implements. Critical look at teachers' class is heterogeneous in nature where learners have different ways of learning which makes the rate of assimilation to differ from one learner to another (Franzoni & Assar, 2009). Often times teachers fail to acknowledge individual differences that exists among learners, if these is done, transmitting knowledge, learning becomes less stressful and natural and the rate of assimilation is high (Murundu, Okwara, Otienoh & Murundu, 2017).

Physics contents could be presented in many different media that conveys information between learners and the teacher and carried messages with instructional purposes. These assist learners to understand what the teacher teaches in a more convenient way, motivates, stimulates, capturing attention and engaging learners in a meaningful learning experiences which leads to effective learning outcomes (Bingimlas, 2009). No two media present knowledge and information the same way, therefore, no one media can claim effectiveness or superiority over the other. The use of one or combination improves the quality of the presented content (Hashim & Hashim, 2015). According to Ramdhani & Muhammadiyah (2015) defined media learning as a strategy, tool and technique used by teachers to communicate and interact with learners for teaching effectiveness. In the same vein, Nurseto (2011) stated that media learning is a means of channeling information, instructions to learners. He further stated that embarking on the use of media instruction will assist physic teachers to achieve learning objectives within a short time, simplify teaching materials and concretized materials abstracts. Methods of representing knowledge in media are through.

- 1) Textual presentation- Material in printed form
- 2) Video or Audio-visual presentation- television, video cassettes, CD-ROM, Satellite and cable transmission.
- 3) Audio presentation-cassettes, radio and telephones (Edorgan, 2010).

In selecting any of the methods, it must be done with the learning objectives of the lesson and the selection process, the way the subject is taught, teachers' and learners' variables, instructional resources, administrative factors to mention a few (Luvisa, 2003). Learners' factor is an important factor that affects media selection because not every individual has the same way of learning and rate of assimilation differs. Some learnt through visual, auditory and prints. It is important to know that media learning should improve learners' achievement which is characterized by a positive change in the behavior and attitude of learners (Edorgan, 2010). Faronzi & Assar (2009) opined that learning resources should not just reflect teachers' style, but should accommodate all kinds of students with different learning styles. Ramdhani & Muhammadiyah (2015) stated that learning media is very important in message delivery, stimulates thoughts, feelings and encourages learning process if appropriately deployed and learners' learning

styles are considered. To achieve this, learning styles of learners should be considered in making any decision on appropriate media format to be deployed.

According to Dunn (1990) that learning style is perceived as the way in which learner begins to ponder on, absorb, and retain new and difficult information. Learning style can also be described as a set of variables, behaviors and attitudes that facilitate learning for an individual in a given situation (Sternburg, 1990). Furthermore, Akinbobola (2015) described learning style as distinctive behaviors which serve as indicators of how a person learns from and adapts to his/her environment. Riding and Rayner (1998) opined that students' learning style has a tendency to approach cognitive tasks with a preferred mental set. Yakasai (1991) stated that learning style is the way and individual thinks, reasoned, handled and decisions taken when confronted with a problem. From the above, it is discernible that learning styles provides direction to teaching and learning. Al-Zayed (2017) studied the relationship between learning styles on English as a foreign Language at the tertiary level. He found out that most students preferred auditory learning styles and Kinesthetic styles while visual styles were the least. Akinbobola (2015) also investigated a study on the effects of learning styles and teaching strategies on students' achievement in physics. He discovered that guided discovery is the most effective instructional strategy for physics students with sensing/intuitive learning styles while active/reflective learning styles was the second preferred for facilitating students' achievement in physics.

In contrary, Naqvi and Naqvi (2017) investigated the effect of learning styles and gender on the performance scores of undergraduate students. He discovered that there is no significant difference on learning styles and gender. Sara (2010) investigated the effects of learning styles on career preference of senior school students in Jigawa state and the finding discovered that significant sex difference exist in students' learning styles. Murundu, Okwara, Otienoh & Murundu (2017) conducted a study on factors affecting selection and use of media for Christian religious education and learning outcomes. The study adopted descriptive survey design. The study revealed that learners' and teachers' related variables, available time and media, cost of media, and other constraints were among factors affecting selection and use of media for Christian religious education learning outcome.

The theoretical framework is hinged on the Fleming NARK model (2015). He proposed learning style theory that is based on four sensory modalities i.e Visual, Auditory, Write/Read and Kinesthetic learning. He stated that visual learners have preference for sight (graphs, charts, diagrams) or any symbol that convey messages. Auditory learners learnt through listening (lectures, discussions, tapes etc.) while kinesthetic learners learn by doing (touching, hands-on and exploring the world).

When teachers put the learning styles of the students into consideration in teaching, this will help students gain competence in what the teacher is teaching them and in turn improves students' academic achievement (Faniel Wesonga & Aurah, C, 2019). Understanding learners and the way they learn will make the teacher to gain insight into making academic information more accessible to

learners, increase their commitment and interest in the subject which will assist the teacher to impart new knowledge. Understanding learning styles helps the teacher in designing instruction and gives learners more understanding of their strengths and weaknesses. There is thus paucity of researches on students' preferred learning styles on media selection on learners' academic achievement in physics among distance learners in Nigeria despite the fact that physics is a course that helps technology and scientific development. It is therefore becoming imperative to examine the effectiveness of learners' learning styles and media format on academic achievement among physics learners in distance learning institute, University of Lagos, Nigeria.

The Problem Statement

It has been generally observed that traditional method of teaching commonly used could not accommodate the preferred learning style most especially that there is a paradigm shift from face to face learning to virtual learning due to COVID-19 pandemic. There is always a misunderstanding between students' learning styles and particular media to use to effect learning. It is expedient that any media format selected to use in teaching physics, learning styles of learners should be adequately considered. Therefore, would significant difference exist in learners' academic achievement with different learning styles when exposed to different media format of instruction?

Objectives of the Study

This research tends to examine the effectiveness of learning styles and media formats among physics learners' academic achievement in distance learning institute, university of Lagos. Specifically, the study was designed to investigate the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) NARK model (2015) when taught using different media format.

Research Hypotheses

Based on the objectives of the study, the following hypotheses were formulated at 0.05 level of significance

- H01: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using print format
 - H02: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using audio format
 - H03: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using audiovisual format
 - H04: No significant main effect of learning style on physics learners' achievement
 - H05: No significant interaction effect of treatment (media format) and learning styles on Learners' achievement
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2. Methodology

The researcher adopted quasi-experimental research design for the study. The population of the study consisted of Year One physics education learners for 2018/2019 academic session. However, out of the population, two hundred and ninety-five learners (295) participated as sample size of the study using the sample table provided by Kreycie and Morgan (1971) they were selected through balloting using purposive sampling technique. The criteria used were

- i. Learner that registered for 2018/2019 academic session and registered for PHS 112(Introductory Physics II)
- ii. Those that are willing to participate in the study
- iii. Those that score minimum of 50% in PHS 111(Introductory Physics 1)

The Index of Learning Styles Questionnaire (ILSQ) and Physics Achievement Test (PAT) were used as instrument for data collection. Learners were made to fill the ILS questionnaire which comprise of 44 items with option A to B adapted from Felder- Silverman (1988) was used to categorized and determine the strength and preferences for learners learning styles. After filling the questionnaire learners were distributed to different learning styles they belong using their responses. Thirty-four (34) were visual learners, forty-six (46) are auditory while thirty-one (31) were kinesthetic learning style respectively. PAT comprises of 25 items with 3 options and one distracter. Each correct answer carries 4marks. The validation of PAT was done by physics educators and reliability of the instruments ILSQ and PAT were computed using Pearson product moment correlation and KuderRichardson-21. The instrument was trial tested on 20 learners who are not part of the study but met the criteria and the reliability were 0.88 and 0.78 respectively.

Research assistance were exposed to training on the interaction and deployment of the course materials in different formats (print, audio and audiovisual) on the learning management system (LMS). The training lasted for one week and the course materials in different media formats were deployed and pretest was administered. After the expiration of the treatment which lasted for four-week interaction with PHS 112 with the guidance of the research assistance online, posttest was administered. The data collected were analysed using Analysis of Covariance (ANCOVA), Post-Hoc Tests and hypotheses tested at 0.05 level of significance.

3. Results and Discussion

Research Hypothesis 1: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using print format through the LMS.

Table 1. Achievement in Physics gain by different learning styles taught using print media format

Learning Styles Test		N	Minimum	Maximum	Mean	Std. Deviation
Visual	Pre-Test Achievement	34	0	9	2.26	2.745
	Post-Test Achievement	34	8	22	14.85	3.963
	Gain/Loss	34	8	13	12.59	
Auditory	Pre-Test Achievement	46	0	9	3.09	2.589
	Post-Test Achievement	46	9	23	15.30	3.632
	Gain/Loss	46	9	14	12.21	
Kinesthetic	Pre-Test Achievement	31	0	7	1.48	1.823
	Post-Test Achievement	31	10	23	14.39	3.528
	Gain/Loss	31	10	16	12.91	

Source: Researcher's Estimations 2021.

The paired results indicated that there is gain in achievement in Physics by different learning styles when taught using print media format with a mean gain of 12.59, 12.21 and 12.91 respectively. The test for significance effect of different learning styles taught using print media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA).

Table 2. Summary of Analysis of Covariance (ANCOVA) effect of different learning styles of learners taught using print media format on Physics Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	200.235	3	66.745	5.490	.002
Intercept	10773.481	1	10773.481	886.151	.000
Pre Achievement	184.494	1	184.494	15.175	.000
Learning Styles	.073	2	.036	.003	.997
Error	1300.864	107	12.158		
Total	26177.000	111			
Corrected Total	1501.099	110			

Dependent Variable: Post Achievement.

The test for significant main effect of different learning styles of learners taught using print media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed there is no significant main effect of treatment on learners' achievement in Physics at F-value = .003. Therefore, the hypothesis is accepted. Hence, there is no significant difference in the achievement of physics learners with different learning styles (visual, auditory and kinesthetic) taught using print format. Consequently, there is no learning style preference by learners taught using print media format.

Research Hypothesis 2: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) taught using audio format

Table 3. Achievement in Physics gain by different learning styles taught using audio media format

Learning Styles Test		N	Minimum	Maximum	Mean	Std. Deviation
Visual	Pre-Test Achievement	37	0	14	2.65	3.129
	Post-Test Achievement	37	10	24	15.78	3.874
	Gain/Loss	37	10	10	13.13	
Auditory	Pre-Test Achievement	33	0	13	2.33	3.099
	Post-Test Achievement	33	10	21	16.61	3.230
	Gain/Loss	33	10	8	14.28	
Kinesthetic	Pre-Test Achievement	40	0	12	1.95	2.689
	Post-Test Achievement	40	10	23	16.30	3.818
	Gain/Loss	40	10	11	14.35	

Source: Researcher's Estimations 2021.

The paired results indicated that there is gain in achievement in Physics by different learning styles taught using audio media format with a mean gain of 13.13, 14.28 and 14.35 respectively. The test for significance effect of different learning styles taught using audio media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA).

Table 4. Summary of Analysis of Covariance (ANCOVA) effect of different learning styles of learners taught using audio media format on Physics Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	140.911	3	46.970	3.790	.013
Intercept	15954.779	1	15954.779	1287.212	.000
Pre Achievement	128.697	1	128.697	10.383	.002
Learning Styles	18.077	2	9.039	.729	.485
Error	1313.852	106	12.395		
Total	30388.000	110			
Corrected Total	1454.764	109			

Dependent Variable: Post Achievement.

The test for significant main effect of different learning styles of learners taught using audio media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed no significant main effect of treatment on learners' achievement in Physics at F-value = .729. Therefore, the hypothesis is accepted. Hence, there is no significant difference in the achievement of physics learners with different learning styles (visual, auditory and kinesthetic) taught using audio format. Consequently, there is no learning style preference by the learners taught using audio media format.

Research Hypothesis 3: No significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using audiovisual format

Table 5. Achievement in Physics gain by different learning styles taught using audiovisual media format

Learning Styles	Test	N	Minimum	Maximum	Mean	Std. Deviation
Visual	Pre-Test Achievement	28	0	6	.79	1.424
	Post-Test Achievement	28	10	22	13.86	3.577
	Gain/Loss	28	10	16	13.07	
Auditory	Pre-Test Achievement	28	0	12	2.64	3.832
	Post-Test Achievement	28	10	23	15.75	3.668
	Gain/Loss	28	10	11	13.11	
Kinesthetic	Pre-Test Achievement	18	0	11	3.28	3.953
	Post-Test Achievement	18	10	24	18.06	4.007
	Gain/Loss	18	10	13	14.78	

Source: Researcher's Estimations 2021.

The paired results indicated that there is gain in achievement in Physics by different learning styles taught using audiovisual media format with a mean gain of 13.07, 13.11 and 14.78 respectively. The test for significance effect of different learning styles taught using audiovisual media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA).

Table 6. Summary of Analysis of Covariance (ANCOVA) effect of different learning styles of learners taught using audiovisual media format on Physics Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	296.954 ^d	3	98.985	7.884	.000
Intercept	10731.660	1	10731.660	854.739	.000
Pre Achievement	102.740	1	102.740	8.183	.006
Learning Styles	106.592	2	53.296	4.245	.018*
Error	878.883	70	12.555		
Total	19172.000	74			
Corrected Total	1175.838	73			

Dependent Variable: Post Achievement. * Main effect is significant at 5% level.

The test for significant main effect of different learning styles of learners taught using audiovisual media format on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed a significant main effect of treatment on learners' achievement in Physics at F-value = 4.245 ($p < 0.05$). Therefore, the hypothesis is rejected. Hence, there is significant difference in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) taught using audiovisual format. Consequently, there is learning style preference by the learners taught using audio media format. The most significant treatment effect is determined using pairwise mean comparison.

Table 7. Post-Hoc Tests: Pairwise Comparisons of Means for Achievement

(I) Treatment	(J) Treatment	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval for Difference Lower Bound Upper Bound	
Kinesthetic	Visual	3.255*	1.120	.005	1.021	5.489
Kinesthetic	Auditory	2.065*	1.074	.049	-.076	4.207
Auditory	Visual	1.190	.978	.228	-.762	3.141

*. The mean difference is significant at the .05 level. Based on estimated marginal means.
Pairwise comparisons: Least Significant Difference.

The pairwise comparison results indicated that Kinesthetic is the most effective learning style taught by audiovisual media format which significantly influences learners' achievement, since there is significance mean difference compared to other learning styles at 3.255 ($p < 0.05$) and 2.065 ($p < 0.05$) respectively.

Research Hypothesis 4: There is no significant main effect of learning style on physics learners' achievement

Table 8. Achievement in Physics gain by different learning styles

Learning Styles	Test	N	Minimum	Maximum	Mean	Std. Deviation
Visual	Pre- Achievement Test	99	0	14	1.99	2.701
	Post-Achievement Test	99	8	24	14.92	3.864
	Gain/Loss	99	8	10	12.93	
Auditory	Pre- Achievement Test	107	0	13	2.74	3.097
	Post-Achievement Test	107	9	23	15.82	3.534
	Gain/Loss	107	9	10	13.08	
Kinesthetic	Pre- Achievement Test	89	0	12	2.06	2.789
	Post-Achievement Test	89	10	24	15.99	3.953
	Gain/Loss	89	10	12	13.93	

Source: Researcher's Estimations 2021.

The paired results indicated that there is gain in achievement in Physics by different learning styles with a mean gain of 12.93, 13.08 and 13.93 respectively. The test for significance main effect of different learning styles on learners' achievement in Physics is determined using analysis of covariance (ANCOVA).

Table 9. Summary of Analysis of Covariance (ANCOVA) effect of different learning styles of learners on Physics Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	543.496a	3	181.165	14.315	.000
Intercept	38416.718	1	38416.718	3035.510	.000
Pre Achievement	479.139	1	479.139	37.859	.000
Learning Styles	51.088	2	25.544	2.018	.135
Error	3682.829	291	12.656		

Total	75737.000	295
Corrected Total	4226.325	294

Dependent Variable: Post Achievement.

The test for significant main effect of different learning styles of learner on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed no significant main effect of learning styles on learners' achievement in Physics at F-value = 2.018. Therefore, the hypothesis is accepted. Hence, there is no significant main effect of learning style on physics learners' achievement. Consequently, there is no learning style preference by the learners.

Research Hypothesis 5: There is no significant interaction effect of treatment (media format) and learning styles on learners' achievement

Table 10. Achievement in Physics gain by Media Format and learning styles Interaction

Media Format	Learning Styles	N	Minimum	Maximum	Mean	Std. Deviation
Print	Visual Achievement	68	0	22	8.56	7.187
	Auditory Achievement	92	0	23	9.20	6.897
	Kinesthetic Achievement	62	0	23	7.94	7.075
Audio	Visual Achievement	74	0	24	9.22	7.480
	Auditory Achievement	66	0	21	9.47	7.847
	Kinesthetic Achievement	80	0	23	9.12	7.931
Audiovisual	Visual Achievement	56	0	22	7.32	7.125
	Auditory Achievement	56	0	23	9.20	7.586
	Kinesthetic Achievement	36	0	24	10.67	8.458

The results indicated that there is gain in achievement in Physics by auditory learning style of learners taught using print and audio media formats with a mean gain of 9.20 and 9.47 respectively while there is gain in achievement in Physics by Kinesthetic learning style of learners taught using audiovisual media format with a mean gain of 10.67. The test for significance interaction effect of treatment (media format) and learning styles on learners' achievement is determined using analysis of covariance (ANCOVA).

Table 11. Summary of Analysis of Covariance (ANCOVA) interaction effect of Media Format and Learning Styles on Learners' Achievement

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	720.855 ^a	9	80.095	6.512	.000
Intercept	36920.102	1	36920.102	3001.659	.000
Pre Achievement	404.060	1	404.060	32.851	.000
Media Format	108.946	2	54.473	4.429	.013
Learning Styles	72.627	2	36.314	2.952	.054
Media Format * Learning Styles	76.850	4	19.213	1.562	.185
Error	3505.471	285	12.300		
Total	75737.000	295			
Corrected Total	4226.325	294			

Dependent Variable: Post Achievement.

The test for significant main interaction effect of media formats and learning styles on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed there is no significant main interaction effect of media formats and learning styles on learners' achievement in Physics at $F\text{-value} = 1.562$. Therefore, the hypothesis is accepted.

Discussion of Results

According to the result of the study, hypothesis 1 which stated that no significant difference exists in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when exposed to print format. The results revealed no significant main effect of treatment on learners' achievement in Physics at $F\text{-value} = .003$. Therefore, the hypothesis is accepted. Hence, there is no significant difference in the achievement of physics learners with different learning styles (visual, auditory and kinesthetic) taught using print format. Consequently, there is no learning style preference by learners taught using print media format. The finding is supported by Akinbobola, (2011a and 2015) found that visual learners get more information from visual images and verbal written and spoken which characterize of conventional methods and prints. He went further that audial and visual learners performed significantly better than kinesthetic learners when exposed to traditional method of print.

Hypothesis II stated that there is no significant difference in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) when taught using audio format. The findings from the test of significance, the results revealed no significant main effect of treatment on learners' achievement in Physics at $F\text{-value} = .729$. Therefore, the hypothesis is accepted. Hence, there is no significant difference in the achievement of physics learners with different learning styles (visual, auditory and kinesthetic) taught using audio format. Consequently, there is no learning style preference by the learners taught using audio media format. This is in line with the findings of Rahadian and Budiningsih (2017) that when learners discovered their learning styles, it is much easier to switch and accommodate any media format for instruction.

The findings also revealed that the results revealed a significant main effect of treatment on learners' achievement in Physics at $F\text{-value} = 4.245$ ($p < 0.05$). Therefore, the hypothesis is rejected. Hence, there is significant difference in the achievement of physics learners with different learning styles (visual, Auditory and Kinesthetic) taught using audiovisual format. Consequently, there is learning style preference by the learners taught using audio media format. The most significant treatment effect is determined using pairwise mean comparison. The pairwise comparison results indicated that Kinesthetic is the most effective learning style taught by audiovisual media format which significantly influences learners' achievement, since there is significant mean difference compared to other learning styles at 3.255 ($p < 0.05$) and 2.065 ($p < 0.05$) respectively. This is supported by Rahadian and Budiningsih (2017) that students need autonomy and the ability to make their decision for improved achievement. This outcome collaborated that of Erica, Wehrwein, Stephen, and DiCarlo, (2007) who reported

that majority of male students used in their study preferred kinaesthetic learning whereas majority of female students preferred visual.

The results revealed no significant main effect of learning styles on learners' achievement in Physics at $F\text{-value} = 2.018$. Therefore, the hypothesis is accepted. Hence, there is no significant main effect of learning style on physics learners' achievement. Consequently, there is no learning style preference by the learners. According to Franzoni, & Assar, (2009) stated that using different learning resources helps students with different characteristics and satisfied with the electronic media used. The approach was embraced by students who felt that introducing new idea can help them have a better performance while learning.

The test for significant main interaction effect of media formats and learning styles on learners' achievement in Physics is determined using analysis of covariance (ANCOVA). The results revealed there is no significant main interaction effect of media formats and learning styles on learners' achievement in Physics at $F\text{-value} = 1.562$. Therefore, the hypothesis is accepted. This is in line with the study of Bronack (2011) infer that media characteristics enhances learning process when learning style is identified which has led to improved effectiveness in academic achievement. This further affirm that flexibility, asynchrony, interactivity and richness of media improves academic achievement.

4. Conclusion

From results, it was evident that students' learning style and aligning to media format selection have proven beneficial for improving learner's achievement in physics. this implied that there should be a proactive approach and urgent need for teachers to select media format that suit the heterogeneous class. The results also imply that all the media formats can be used to improve achievement of physics students.

Recommendation

Based on the strength of the study findings recommend that

1. Learning styles of learners should be identified to ensure the media formats or instructional strategies to be deployed.
 2. Students' with multiple learning styles should be catered for in the curriculum
 3. Teachers professional development should be organized for teachers on teaching effectiveness through the use of learning styles and media selection among distance learners.
 4. Students should have idea about their preferred learning styles for easy comprehension
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