

**Assessment of Assimilation and Academic Performance of Students During
Winter and Summer Seasons**

**Avaliação da Assimilação e Desempenho Acadêmico dos Alunos Durante as
Temporadas de Inverno e Verão**

**Evaluación de la Asimilación y Rendimiento Académico de los Estudiantes
Durante las Temporadas de Invierno y Verano**

Received: 08/25/2020 | Reviewed: 10/20/2020 | Accept: 12/11/2020 | Published: 12/11/2020

Abubakar Muhammed Dadile

ORCID: <https://orcid.org/0000-0002-1999-3984>

Department of Forestry and Wildlife, Federal University Gashua, Yobe State Nigeria

E-mail: abubakardadile@gmail.com

Abubakar Muhammad Dadile

ORCID: <https://orcid.org/0000-0003-2403-6406>

Department of computer science, Umar Suleiman College of Education Gashua,

Yobe State Nigeria

E-mail: abubakarmdadile@gmail.com

Habu Mohammed Dadile

ORCID: <https://orcid.org/0000-0003-0523-3201>

Department of Nursing, Shehu Sule College of Nursing and Midwifery Damaturu, Nigeria

E-mail: habudadile@gmail.com

Nuruddeen Mohammed

ORCID: <https://orcid.org/0000-0003-0047-599X>

Department of Agriculture Technology, Yobe State College of Agriculture, Science and

Technology Gujba, Nigeria

E-mail: nuruddeenmb88@gmail.com

Abstract

The study was conducted at Gashua, Yobe State. The weather condition of the area during summer is so terrible to the extent that the majority of inhabitants are searching for ice blocks

or cold water to drink in order to feel a bit comfortable. In the school, both teachers and students were not comfortable during summer and winter seasons and these made teaching and learning processes boring. Therefore, the study is aimed at assessing the assimilation and academic performance of students during the summer and winter seasons. A random selection of past examination record sheets of students in Yusad secondary school, Gashua was used, and information on their academic performance for summer and winter season were obtained from senior secondary one and two (SS1 and SS2) classes. Ten student record books were selected at random for their academic performance on the subject area of biology. Their scores of the academic performance records were subjected to a descriptive statistics where mean, standard deviation was calculated and Z-test was determined. The results of this study revealed that the summer and winter seasons do not affect the assimilation and results reveals that the academic performance of students varies between - 0.58 in SS1 to - 0.72 in SS2 which means that the summer and winter seasons had no influence on the assimilation and performance of students but might cause inconvenience, unfavorable, disturbance and unsuitable conditions for teaching and learning processes.

Keywords: Assimilation; Academic performance; Summer and winter seasons.

Resumo

O estudo foi realizado em Gashua, estado de Yobe. As condições climáticas da região durante o verão são tão terríveis que a maioria dos habitantes procura blocos de gelo ou água fria para beber em outro lugar para se sentir um pouco confortável. Na escola, professores e alunos não se sentiam confortáveis durante as temporadas de verão e inverno, o que tornava o processo de ensino e aprendizagem entediante. Portanto, o objetivo do estudo é avaliar a assimilação e o desempenho acadêmico de alunos durante as temporadas de verão e inverno. Uma seleção aleatória de folhas de registro de exames anteriores de alunos na escola secundária Yusad, Gashua, foi usada, e informações sobre seu desempenho acadêmico para o verão e inverno foram obtidas nas classes do ensino médio um e dois (SS1 e SS2). Dez livros de registro de alunos foram selecionados aleatoriamente para seu desempenho acadêmico na área disciplinar de biologia. Suas pontuações nos registros de desempenho acadêmico foram submetidas a uma estatística descritiva onde a média, o desvio padrão foi calculado e o teste Z foi determinado. Os resultados deste estudo revelaram que as estações de verão e inverno não afetam a assimilação e os resultados revelam que o rendimento escolar dos alunos varia entre - 0,58 no SS1 a - 0,72 no SS2 o que significa que as estações de verão e inverno não

influenciaram na assimilação e desempenho dos alunos, mas pode causar inconvenientes, desfavoráveis, perturbações e condições inadequadas aos processos de ensino e aprendizagem.

Palavras-chave: Assimilação; Performance acadêmica; Estações de verão e inverno.

Resumen

El estudio se realizó en Gashua, estado de Yobe. La condición climática de la zona durante el verano es tan terrible que la mayoría de los habitantes busca bloques de hielo o agua fría para beber en otros lugares para sentirse un poco cómodos. En la escuela, tanto los profesores como los estudiantes no se sentían cómodos durante las temporadas de verano e invierno y esto hacía que los procesos de enseñanza y aprendizaje fueran aburridos. Por tanto, el estudio tiene como objetivo evaluar la asimilación y el rendimiento académico de los estudiantes durante las temporadas vs verano e invierno. Se utilizó una selección aleatoria de hojas de registro de exámenes anteriores de estudiantes de la escuela secundaria de Yusad, Gashua, y se obtuvo información sobre su rendimiento académico para la temporada de verano e invierno de las clases de secundaria superior uno y dos (SS1 y SS2). Se seleccionaron al azar diez libros de registro de estudiantes por su desempeño académico en el área temática de biología. Sus puntuaciones de los registros de rendimiento académico se sometieron a una estadística descriptiva donde se calculó la media, la desviación estándar y se determinó la prueba Z. Los resultados de este estudio revelaron que las temporadas de verano e invierno no afectan la asimilación y los resultados revelan que el rendimiento académico de los estudiantes varía entre - 0.58 en SS1 a - 0.72 en SS2 lo que significa que las temporadas de verano e invierno no tuvieron influencia en la asimilación y desempeño de los estudiantes pero que puedan ocasionar molestias, desfavorables, perturbaciones y condiciones inadecuadas para los procesos de enseñanza y aprendizaje.

Palabras clave: Asimilación; Desempeño académico; Temporadas de verano e invierno.

1. Introduction

The study conducted at Yusad secondary school Gashua, to determine the influences of environmental factors (summer and winter seasons) on the assimilation and performance of the students in secondary school. Meanwhile, Gashua is located in the northern part of Yobe state with intense heat during summer and extreme cold and dust during winter, which was

suspected to affect the assimilation and academic performance of students. Meanwhile one of the researchers reported that academic performance in a school subject is symbolized by a score or marks on the achievement test (Epunnam, 1999); while retention of learning according to Momoh-Olle (1999) is the repeated performance by a learner of the behavior earlier acquired, elicited after an interval of time. It is affected by the degree of original learning, the methods of learning and learners' memory capacity among others (Demmert 2001).

Many researchers at different angles of the world shared different views on the effect of temperature in the teaching and learning process. Gaines and Curry (2011) reported that the learning environment affects the assimilation and performance of students. Noise, unfavorable temperature, lack of sufficient light, overcrowded classes, misplaced boards and inappropriate classroom layout make up factors that could be confounding variables distracting students in class. Meanwhile, Marsden (2005) reported that safe and orderly class room environment (aspect of instructional space), school facilities (accessories) were significantly related to students academic performance in school the three researchers. Similarly, Feng and Li (2016), Glass man (1994) reported that a comfortable and caring environment among other treatment helped to contribute to student academic performance. Studies have reported little if any loss under extreme temperature exposure (chiles *et al.*, 1958, Pepler 1959, Colquhoun, 1969 and Grether *et al.*, 1971) where as other studies have reported performance decrement (Mock 1947, Fraser *et al.*, 1961, Pepler 1960)

Meanwhile, poor maintenance and ineffective ventilation systems lead to poor health among students as well as teachers, which leads to poor performance and higher absentee rates. These factors can adversely affect student behavior and lead to a higher level of frustration among teachers and poor learning attitudes among student (Frazier 2002, Lyons, 2001 and Ostendorf 2001). Rats observed under a thermal condition in order to determine the effect of temperature on the memory, the rats were expose to cool condition for 60 minutes and the hot for 30 minutes and were selected on the basis of the pilot work conducted which realized some change in the memory than that of cool condition and brought a slow changes in the memory than that of hot condition (Okuno *et al.* 1965).

Several of effects have been devoted to research on factors affecting performance especially in tertiary institution of learning studies of children's educational achievement over time have shown that social background remains one of the main success of educational inequality (Graetz 1995, 2008). Other factors, such as parent support could also account for

variation in student's performance. A high level of parental support has been found to be positively corrected with students achievement regards basic skills (Haanr *et al.* 2005). The study is aimed at determining the effects of summer and winter seasons on the assimilation and academic performance of student in Yusat secondary school, Gashu'a Yobe State.

2. Methodology

The study was a case study research conducted at Yusad secondary school Gashua, Yobe state of Nigeria and covered a period of six weeks. However, the study was achieved by using past or previous student examination records sheets that were examine during summer and winter seasons. Ten students were randomly selected from senior secondary one (SS1) and SS2 classes for their performance on the subject areas of Biology irrespective of science, commercial or arts students. Their academic performance scores of each of the ten selected students were taken, observed and recorded separately for both winter and summer seasons. Meanwhile, a descriptive statistics were use to analyze the variation between the performance in winter and summer seasons by Z- test method whereby the academic performance scores for winter and summer were symbolize as X_1 and X_2 respectively, and their Means and standard deviations are calculated and Z- values were obtained using the following equation;

$$Z = X_1 - X_2 / S.D \dots\dots\dots (1)$$

3. Result and Discussion

The result of the study reveals that the mean values for summer season ranged from 50.2 to 56.8. Meanwhile, the standard deviation varies from 6.52 to 23.86 respectively (Table 1 and 2); this implies that the assimilation and academic performances of the two classes vary significantly with one another in that the SS2 class performed better than the SS1 class under the same weather condition. Meanwhile, the mean and standard deviation for winter season was found to be 54.9 and 6.52 in the SS1 class and 70.7 and 22.89 in the SS2 class (Table 1 and 2). However, this implies that the students in the SS2 are better than the SS1 students in terms of assimilation and academic performance in the school.

Meanwhile, the results obtained from the Z- tests of both SS1 and SS2 for the summer and the winter seasons ranged from - 0.58 to - 0.72, respectively (Table 1 and 2) which

meant that there was no significant differences in the assimilation and academic performance of students during the summer and the winter seasons but might cause inconvenience, disturbance and unfavorable conditions in the teaching and learning processes and this is in line with the reports of Razmjou and Kjellberg (1992), that hot weather destabilized the attention of the students but not affecting their performance. However, Chiles *et al.* (1958) reported that little if any performance loss under extreme temperature exposure, where as other have reported performance decrement (Fraser *et al.*, 1961). Meanwhile, the results of the winter season reveal that there was no significantly influence on the assimilation and academic performance of students but rather favorable environmental factors influences teaching and learning process and this disagreed with the report of Okuno *et al.*,(1965) which stated that cool condition brought slow changes in the memory than that of hot condition.

Table 1. Show the results of the summer and winter seasons on the assimilation and performance of Yusat secondary school, Gashu’a for the SS1 class on the subject of biology.

	Mean	S	S.D	Z-value	Critical value
Heat season	50.2	13.99	6.52	-0.72	±1.69
Cold season	54.9	15.12	6.25		

S is the standard error, S.D is the standard deviation. Source: Authors.

The Table above shows the Z-value which signifies the level academic performance of Yusad secondary school Gashua for the SS1 class in the summer and winter seasons.

Table 2. Show the results of the summer and winter seasons on the assimilation and performance of Yusat secondary school, Gashu’a for the SS2 class.

	Mean	S	S.D	Z-value	Critical value
Heat season	56.8	280.56	23.89	- 0.58	±1.69
Cold season	70.7	290.21	22.79		

S is the standard error, S.D is the standard deviation. Source: Authors.

The Table above shows the Z- test value which signifies the level academic performance of Yusad secondary school Gashua, for the SS2 class in the summer and winter seasons.

4. Recommendation

It is recommend that the school premises should be made environmentally friendly in the sense that trees and ornamental plants should be plant to reduce the adverse effect of high solar radiation that usually occurred during summer season so as minimize by providing sheds in the school premises as reported by Okuno *et al*, (1965) that cold weather influence learning processes.

It is also recommend that summer season has no significant influence on academic performance of students but can destabilize the attention of the student towards learning activities and thereby resulting unperceivable teaching and learning activities. Therefore effort must be made to provide favorable and effective ventilation system that would enhance teaching and learning atmosphere.

It is recommend that government and private schools owners should take serious measures to provide a suitable environment for effective teaching– learning atmosphere in their various schools.

5. Conclusion

In conclusion, the study revealed that summer and winter seasons have no influence on assimilation and performance of students in school but create avenue for inconvenience and unfavorable condition for effective teaching and learning processes. Therefore, it is necessary to provides all possible measures to minimize the conditions for better and favorable teaching and learning environment.

Meanwhile, it is suggested that, the school environments should be made favorable for teaching and learning processes by providing necessary structures, teaching aids, cooling tools such as fans or air conditioners in the classrooms and also the doors and windows should be put in place or intact so that to maintain the inconveniences or unfavorable condition caused during these seasons.

References

Chiles, W.D (1955). *The effects of sleep deprivation on performance of a complex mental task* WADC TECHNICAL NOTE, 55-423, SEPTEMBER, AD 100 691

Colquhoun, P. (1969). *A Treatise on the Police of the Metropolis...*, facsimile of the 7th [1806] edn. Montclair NJ: Patterson Smith.

Demmert, W.G., Jr. (2001). *Improving academic performance among Native American students* <http://www.ael.org/eric/demmert.htm>., 2001

Epunnam, A.D. (1999). *Influence of school, environment variable on academic performance as perceived by students. Unpublished M.Ed thesis sub-Department of Science Education. University of Nigeria, Nsukka.*

Feng, H and Li, J (2016). *Head Teachers, Peer Effects, and Student Achievement. China Economic Review, University Huangzhou (Journal) Vol. 41, Pp 268-283*

Frazer, T.M., Hoover, G.N., Ashe, W.F (1961) *Tracking performance during low-frequency vibration. Aerospace Medicine, 32, 829-835*

Frazier, L.M. (2002). *Deteriorating School Facilities and Student Learning. Eric clearinghouse on Educational Management Eugene, Number 82. Retrieved from <http://ericae.net/edo/ED356564.htm>*

Gaines KS, and Curry ZD (2011). *The inclusive classroom: The effects of color on learning and behavior. Journal of Family and Consumer Sciences Education; 29(1), 46-57.*

Glassman, M.D and Butler, R (1994). *The effect of educational placement and Grade level on the self-perception of low Achievers and students with learning Disabilities. <https://doi.org/10.1177/1002221949402700509>*

Lyons, J.B. (2001). *Do school facilities really impact a child's education?* Retrieved from <http://www.coe.uga.edu/sdpl/articleandpaper/Lyons.html>

Momoh-Olle, J.Y. (1999). *Effects of cognitive preference and advance verbal organizers on the retention of an O'level Physics textual materials. The Nigeria teacher today*, 5(1&2): 26-33.

Okuno, A, Yamamoto, M and Itoh, S.(1965). *Lowering of the body temperature induced by vasopressin The Jananese Journal pf Physiology* 15 (4), 378-387.

Ostendorf, J. (2001). *Influence of school environment of the academic performance of secondary school student. Education*, Pp-50, 1-5

Pepler, R.D. (1958). *Warmth and lack of sleep: accuracy or activity reduced. J. comp. physiol. Psychol.* 52, 446 – 50

Pepler, R.D. (1960). *Warmth, glare and a background of quiet speech: a comparison of their effects on performance. Ergonomics* 3, 68 – 73

Razmjou, S and Kjellberg, A. (1992). *Sustained attention and serial responding in heat: mental effort in the control of performance. Aviation, Space, and Environmental Medicine*, 63(7), 594 – 601.

Percentage of contribution of each author in the manuscript

Abubakar Muhammed Dadile- 40%

Abubakar Muhammad Dadile – 22%

Habu Muhammed Dadile – 20%

Nuruddeen Mohammed – 18%