



A QUANTITATIVE ANALYSIS OF THE IMPACT OF YOGA AND AEROBIC EXERCISE ON THE VITAL CAPACITY OF SCHOOL BOYS

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Abstract:

The study was to find out the effect of yogic practice and aerobic exercises on vital capacity among school boys. To achieve the purpose of the study, 45 students were selected from Colleges in Pudukkottai. The age of the subjects was ranged between 18 to 25 years. 45 subjects were selected at randomly and the subjects were divided into three equal groups namely experimental group I and experimental group II and Control Group. Thus each group consisted of 15 subjects. The investigator selected one of the physiological variables such as vital capacity. The experimental group I was under went six week of yogic practices and experimental group II was under went six weeks of aerobic exercises training programme and the control group was not involves any specific training. The pre test and post test was taken to all the three groups in before and after training programme respectively. To analysis the data investigator used ANCOVA for this study. If 'F' ratio is found significant the investigator used Scheffe's-Post hoc test to find out the better group. The study was concluded that the experimental group I (yogic practices) and experimental group II (aerobic exercises) was significantly improved on vital capacity among school boys. And also it was concluded that the experimental group I (yogic practices) was better than the experimental group II (aerobic exercises) on vital capacity among School Boys.

Key Words: Aerobics, Yoga and Vital Capacity

Introduction:

Yoga means the union or communication or unity with our inner being. 'Asana' means a state of being in which we can remain steady, calm, quiet and comfortable with our physical body and mind. Asanas are an integral part of yoga. Yoga uses the body to exercise and controls the mind so that at a later stage the body and the mind together may harmonize with the soul. The yogasanas affect and penetrate every single cell and tissues making them come to life. Yoga helps to tone up the entire body to regularize blood compositions and improve blood circulations, tones up glands and visceral muscles. Robson states that "yoga develops flexibility and vital capacity". Regular practice of yoga helps to keep our body fit, controls cholesterol level, reduces weight, normalizes blood pressure and improves heart performances. Further, preliminary studies in the United States and India suggest that yoga may be helpful for specific conditions, such as asthma, epilepsy, anxiety, stress and others.

Regular exercise results in an increase in the blood flow and improves oxygen carrying and waste removal capacity and further increases work load capacity (Frank Vitale, 1973). Exercise increases the volume of haemoglobin and erythrocyte of the blood. Also blood vessels are seen to maintain elasticity and suppleness when stressed systematically probably by the beneficial effect of the heart. "Aerobic" basically means living or working with oxygen. Aerobics or endurance exercises are those in which large muscle groups are used in rhythmic repetitive fashion for prolonged periods of time. Aerobics is a good way to decrease our percentage of body fat and to attain the other metabolic benefits of fitness. Aerobics is also a very good way to develop muscular skeletal fitness while building strength, flexibility, co-ordination. Aerobics is a progressive physical conditioning programme that stimulates cardio respiratory activity for a time period sufficiently long to produce beneficial changes in the body. To do any work we need energy and even while at rest some physiological functions have to be carried within our body and for that purpose some calories of energy will be burnt. As the intensity and duration of work increases the demand for the fuel in the working muscles also increases. The organs which supply the needful should cope with the demand.

Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inspiration. It is equal to the inspiratory reserve volume plus the tidal volume plus the expiratory reserve volume. A person's vital capacity can be measured by a spirometer which can be wet (LMAO) or regular spirometer.

Statement of the Problem:

The purpose of the study was to find out the effect of yogic practices and aerobic exercises on vital capacity among school boys.

Hypotheses:

- It was hypothesized that there would be significant difference on the effect of yogic practices and aerobic excises on vital capacity among school boys.

Delimitations:

This study was delimited in the following aspects and these delimitations were taken into consideration while interpreting the results.

- Subjects of the present study were delimited to Colleges in Pudukkottai only.
- Only school male students were selected for the purpose of the study
- The sample of the study was 45 boys.
- The age group of the subject was ranged 18 to 25.
- As far as physiological variables were concerned it was delimited to Vital capacity only
- The period of training programme was delimited to six weeks only.
- The selected criterion variables for the study were assessed by the standardized test items.
- The data were collected on selected criterion variables prior to and immediately after the training period.

Methodology:

Selection of Subjects:

The purpose of this study was to find out the effect of yogic practice and aerobic exercises on selected physical fitness and physiological variables among school boys. To achieve the purpose of the study, 45 students were selected from Colleges in Pudukkottai. The age of the subjects was ranged between 18 to 25 years. 45 subjects were selected at randomly and the subjects were divided into three equal groups namely experimental group I and experimental group II and Control Group. Thus each group consisted of 15 subjects.

Selection of Variables:

The research scholar reviewed the available scientific literatures pertaining to the problem understanding from books, journals, magazines and research papers considering the feasibility of criteria and availability of instruments and the following variables were selected.

Independent Variables:

The following were the independent variables selected for this study

- Yogic Practice
- Aerobic exercise

Dependent Variables:

The following were the dependent variables selected for this study

- Vital capacity

Table 1: Selection of the Test Items

S.No	Variables	Test items	Units
1	Vital Capacity	Wet Spiro Meter	Milliliters

Analysis of the Study:

Table 2: Computation of Analysis of Covariance Results on Vital Capacity among Experimental Groups and Control Group

Test	Yoga	Aerobic	Control	Source of Variance	Sum of Square	Df	Mean Square	Obtain 'F'
Pre-test Mean	2660.00	2640.00	2633.33	BG	5777.77	2	2888.88	0.03
Pre-test S.D	206.32	352.13	246.88	WG	3185333.33	42	75841.20	
Post-test Mean	2880.00	2846.66	2660.00	BG	421777.77	2	210888.88	3.28
Post-test S.D	200.71	315.92	229.28	WG	2697333.33	42	64222.22	
Adjusted Post-Test Mean	2866.81	2850.43	2669.41	BG	359639.78	2	179819.89	18.03
				WG	408718.85	41	9968.75	

* Significant at 0.05 level.

Required table value at 0.05 level of significance for 2 & 42 and 2 & 41 degree of freedom = 3.23

The table 2 shows that the pre-test mean value on vital capacity of experimental group I (yogic practice), experimental group II (aerobic exercises), and control group are 2660.00, 2640.00, and 2633.33 respectively. And standard deviation values of experimental group I, experimental group II and control group are 206.32, 352.13 and 246.88 respectively. The obtained 'F' ratio of 0.03 for pre-test score is less than the required table value of 3.23 for df 2 and 42 at 0.05 level of confidence on vital capacity. The post-test mean value on vital capacity of experimental group I (yogic practices), experimental group II (aerobic exercises) and control group are 2880.00, 2846.66, and 2660.00 respectively. And standard deviation values of experimental group I, experimental group II and control group are 200.71, 315.92 and 229.28 respectively. The obtained 'F'

ratio of 3.28 for post-test score is greater than the required table value of 3.23 for df 2 and 42 at 0.05 level of confidence on vital capacity. The adjusted post-test mean value on vital capacity of experimental group I (yogic practices), experimental group II (aerobic exercises) and control group are 2866.81, 2850.43, and 2669.41 respectively. The obtained 'F' ratio of 18.03 for adjusted post-test score is greater than the required table value of 3.23 for df 2 and 41 at 0.05 level of confidence on vital capacity.

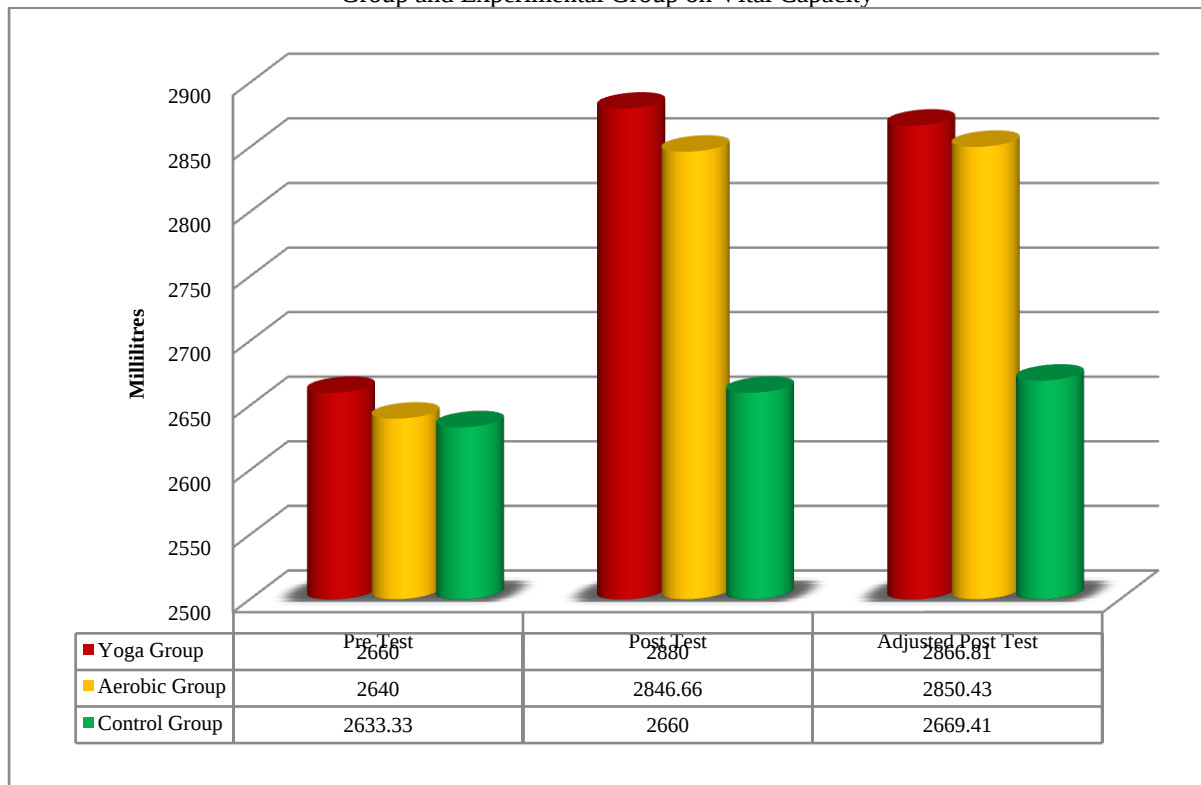
The results of the study indicated that there was a significant difference between the adjusted post-test means of yogic practice group, aerobic exercises and control groups on vital capacity. Whenever they obtained 'F' ratio of adjusted post-test mean was found to be significant, the investigator go for the Scheffe's post hoc test to find out the paired mean differences and it was presented in table 3.

Table 3: Scheffe's Post Hoc Test for Adjusted Mean Values for Yoga Aerobic and Control Group on Vital Capacity

Yoga	Aerobic	Control	Mean Difference	Confidence Interval Value
2866.81	2850.43	-	16.38	87.83
2866.81	-	2669.41	197.4*	
-	2850.43	2669.41	181.02*	

The table 2 shows that the mean difference value between, experimental group I (yogic practice) and experimental group II (aerobic exercises) is 16.38 on vital capacity, it is less than the confidence interval value of 87.83, it indicates that there is no significance difference between experimental group I and experimental group II on vital capacity. The mean difference value between experimental group I (yogic practices) and control group is 197.4 on vital capacity, it is greater than the confidence interval value of 87.83, it indicates that there is a significance difference between experimental group I and control group on vital capacity. The mean difference value between experimental group II and control group is 181.02 on vital capacity, it is greater than the confidence interval value of 87.83, it indicates that there is a significance difference between experimental group II and control group on vital capacity. The pre, post and adjusted post-test mean value of experimental group I (yogic practices), experimental group II (aerobics exercises) and control group on vital capacity were graphically represented in figure 1.

Figure 1: Cylinder Diagram Shows the Mean Values of Pre and Post Tests and Adjusted Post Test of Control Group and Experimental Group on Vital Capacity



Discussion on Findings:

The result of the study indicates that vital capacity is improved by 8% in experimental group I (yogic practices) and 7% in experimental group II (aerobic exercises). The training shows a better improvement than the control group. This is due to the training adapted by the subjects in the training period this clearly shows the yogic practice is a suitable training to improve the vital capacity. From the result of Scheffe's post hoc test the experimental group I (yogic practices) is better than the experimental group II (aerobic exercises).

Discussions on Hypothesis:

The second hypothesis of the study is stated that there would be a significant difference in vital capacity due to effect of yogic practices and aerobic exercises. The results of the study revealed that there is a significant difference in vital capacity due to effect of yogic practices and aerobic exercises. Hence the investigator's hypothesis was accepted.

Conclusion:

Within the limitation of the present study, the conclusion were drawn

- It was concluded that the experimental group I (yogic practices) was significantly improved on vital capacity among school boys.
- It was concluded that the experimental group II (aerobic exercises) was significantly improved on vital capacity among school boys.
- It was concluded that the experimental group I (yogic practices) was better than the experimental group II (aerobic exercises) on vital capacity among school boys.

References:

1. K.G. Promoth, (2010) "Effect of Step Aerobics Training on Selected Physical and Physiological Variables of Physical Education Students, "Pondicherry University, Pondicherry, July, 2010).
2. Prabakaran, T. and Chidambara Raja, S. (2012). Effect of yogic practices on Vital capacity and total cholesterol. *Internat. J. Phy. Edu.* 5(1): 32-34.
3. Gore, M.M., Bhogal, R. S., Kulkarni, D.D. and Bera, T.K. (2003) effects of yoga and aerobics training on cardio respiratory functions in obese people" *Yoga Mimamsa*, Vol. XXXV, No.1 and 2: 35-53, April 2003 and July 2003.
4. A. Dinesh Kumar, R. Sivaraman, Asymptotic Behavior of Limiting Ratios of Generalized Recurrence Relations, *Journal of Algebraic Statistics*, Vol 13, No. 2, 2022, 11-19
5. R. Sivaraman, J. Suganthi, A. Dinesh Kumar, P. N. Vijayakumar, R. Sengothai, On Solving an Amusing Puzzle, *Specialusis Ugdyms, Special Education*, Vol 1, No. 43, 2022, 643-647
6. A. Dinesh Kumar, R. Sivaraman, Analysis of Limiting Ratios of Special Sequences, *Mathematics and Statistics*, Vol 10, No. 4, 2022, 825-832
7. A. Dinesh Kumar, R. Sivaraman, On Some Properties of Fabulous Fraction Tree, *Mathematics and Statistics*, Vol 10, No. 3, 2022, 477-485
8. P. Senthil Kumar, R. Abirami, A. Dinesh Kumar, Fuzzy Model for the Effect of rhIL6 Infusion on Growth Hormone, *International Conference on Advances in Applied Probability, Graph Theory and Fuzzy Mathematics*, 2014, 246-252
9. C. Narayanan, A. Dinesh Kumar, S. Priyadharshini, S. Revathy, Cardiac Disorder Diagnosis Through Nadi (Pulse) Using Piezoelectric Sensors, *International Journal of Multidisciplinary Research and Modern Education*, Vol 1, No. 1, 2015, 209-214
10. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Effect of Gallbladder Contraction Result Using Uniform Distribution, *Arya Bhatta Journal of Mathematics and Informatics*, Vol 6, No. 2, 2014, 323-328
11. M. Vasuki, A. Dinesh Kumar, R. Prabhakaran, A Study on GSM-Mobile Phone Network in Graph Theory, *International Journal of Current Research and Modern Education*, Vol 1, No. 1, 2016, 772-783
12. S. Rajivgandhi, A. Dinesh Kumar, R. Sundareswaran, V. Vineeth, Synthesis and Characterization of ZnO Nanoparticles, *International Journal of Innovative Research in Technology, Science & Engineering*, Vol 1, No. 5, 2015, 73-78
13. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, Stochastic Model to Estimate the Insulin Secretion Using Normal Distribution, *Arya Bhatta Journal of Mathematics and Informatics*, Vol 7, No. 2, 2015, 277-282
14. A. Victor Richardson, A. Dinesh Kumar, S. Suthagar, E. Neduncheralathan, Thermal Performance Enhancement of Heat Pipe Using TiO₂ Nanofluid, *International Journal of Multidisciplinary Research and Modern Education*, Vol 1, No. 1, 2015, 64-75
15. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Multidrug Resistance in Human Gallbladder Carcinoma Results Using Uniform Distribution, *International Journal of Emerging Engineering Research and Technology*, Vol 2, No. 4, 2014, 278-283
16. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to find the Gallbladder Motility in Acromegaly Using Exponential Distribution, *International Journal of Engineering Research and Applications*, Vol 4, No. 8, 2014, 29-33
17. Nishant B. Narnaware, A. Dinesh Kumar, Educational Development and Evaluation: A Case Study from Nepal, *Saudi Journal of Engineering and Technology*, Vol 7, No. 9, 2022, 513-519
18. A. Dinesh Kumar, M. Vasuki, A Study on Challenges Faced in Palmyrah Cultivation With Special Reference to Perambalur District, *Indo American Journal of Multidisciplinary Research and Review*, Vol 7, No. 1, 2023, 81-84

19. M. Vasuki, A. Dinesh Kumar, Customers Preference and Satisfaction Towards Tamil Nadu Palm Products Development Board, International Journal of Multidisciplinary Research and Modern Education, Vol 9, No. 1, 2023, 142-149
20. K. Veerakumar, A. Dinesh Kumar, People Preference towards Organic Products, International Journal of Recent Research and Applied Studies, Vol 4, No. 7, 2017, 73-75
21. K. Veerakumar, A. Dinesh Kumar, Challenges of Agricultural Development, International Journal of Recent Research and Applied Studies, Vol 4, No. 5, 2017, 76-79
22. M. Suresh Kumar, A. Dinesh Kumar, Effect of Mental Training on Self Confidence among Professional College Students, International Journal of Recent Research and Applied Studies, Vol 4, No. 12, 2017, 51-53
23. M. Suresh Kumar, A. Dinesh Kumar, A Statistical Approach towards the Effect of Yoga on Total Cholesterol of Overweight Professional College Students, International Journal of Recent Research and Applied Studies, Vol 4, No. 2, 2017, 126-128
24. R. Sindhuja, A. Dinesh Kumar, A Study on the Level of Work-Life Balance among Medical Representatives, International Journal of Recent Research and Applied Studies, Vol 5, No. 12, 2018, 28-33
25. S. R. Boselin Prabhu, P. Rajeswari, A. Dinesh Kumar, An Analytical Review of Fiber-Optic Sensors and Biosensors, Journal of Engineering, Scientific Research and Applications, Volume 2, No. 1, 2016, 58-61
26. S. R. Boselin Prabhu, N. Balakumar, P. Rajeswari, A. Dinesh Kumar, Wireless Electricity Transfer Methodologies Using Embedded System Technology, Journal of Engineering, Scientific Research and Applications, Vol 2, No. 1, 2016, 81-89
27. S. R. Boselin Prabhu, P. Rajeswari, A. Dinesh Kumar, Analysis of Decentralized Clustering Hierarchy for Highly Distributed WSN, Journal of Engineering, Scientific Research and Applications, Vol 2, No. 2, 2016, 45-49
28. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Mathematical Model by Using Birth Death Processes to Estimate the Gallbladder Mean Emptying Curves, International Journal of Applied Research, Vol 1, No. 4, 2015, 34-37
29. P. Dhinakaran, S. Suthagar, E. Neduncheralathan, A. Dinesh Kumar, Investigation and Numerical Analysis as Cast Heat Treated Aluminium Alloy (Al-20% with MG) By Tensile Test, International Journal of Applied Research, Vol 1, No. 6, 2015, 114-117
30. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model for Finding the Gallbladder Ejection Fraction Results, International Journal of Applied Research, Vol 1, No. 2, 2015, 91-94
31. A. Dinesh Kumar, M. Vasuki, P. Pavithra, S. Srinithi, Estimate the Insulin Secretion Stimulated by GLP-1 Using Yule & CMJ Process, International Journal of Mathematics and Computing, Vol 1, No. 1, 2015, 1-4
32. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, A New Stochastic Model to Estimate the Influence of Insulin on Circulating Ghrelin Using Gamma Distribution, International Journal of Applied and Advanced Scientific Research, Vol 1, No. 1, 2016, 4-8
33. M. Vasuki, A. Dinesh Kumar, Mohamed Usman Ali, Antony Raja, Bio Mathematical Model to Find the Gallbladder Contraction Outcomes Using Normal Distribution, International Journal for Research in Applied Science & Engineering Technology, Vol 4, No. 2, 2016, 233-236
34. A. Dinesh Kumar, M. Vasuki, Optimal Proportional Reinsurance with a Constant Rate of Interest, International Journal of Computational Research and Development, Vol 1, No. 1, 2016, 26-35
35. A. Dinesh Kumar, M. Vasuki, Estimate the Adrenocorticotrophic Hormone on Cortisol and DHEA'S Production through HJB Equations Using Stochastic Analysis, International Journal of Computational Research and Development, Vol 1, No. 1, 2016, 6-10
36. A. Dinesh Kumar, M. Vasuki, J. Malathi, A Study on Irredundance and Insensitive Arc in Fuzzy Graphs, International Journal of Current Research and Modern Education, Vol 1, No. 1, 2016, 736-747
37. A. Dinesh Kumar, M. Vasuki, A Study on Pythagorean Triples, International Journal of Interdisciplinary Research in Arts and Humanities, Vol 1, No. 1, 2016, 14-21
38. P. Senthil Kumar, K. Balasubramanian, A. Dinesh Kumar, Stochastic Model to Estimate the Changes in Plasma Insulin and FFAs During OLTT and OGTT Using Normal Distribution, Bulletin of Mathematics and Statistics Research, Vol 3, No. 3, 2015, 10-16
39. A. Dinesh Kumar, R. B. Ramyaa, S. Thilaga, N. Punitha, A New Mathematical Model to Estimate the Plasma Cortisol Concentration Using Gamma Distribution, Adalya Journal, Vol 7, No. 2, 2018, 55-59
40. P. Senthil Kumar, A. Dinesh Kumar, M. Vasuki, Stochastic Model to Find the Diagnostic Reliability of Gallbladder Ejection Fraction Using Normal Distribution, International Journal of Computational Engineering Research, Vol 4, No. 8, 2014, 36-41

41. M. Vasuki, P. Senthil Kumar, N. Rajesh, On Anti-Q-Fuzzy Deductive Systems of Hilbert Algebras, International Journal of Analysis and Applications, Vol 21, No. 42, 2023, 1-15
42. M. Vasuki, P. Senthil Kumar, Said Broumi, N. Rajesh, On Radical of Neutrosophic Primary Submodule, International Journal of Neutrosophic Science, Vol 22, No. 3, 2023 36-52
43. M. Vasuki, R. Sivaraman, Solving Quadratic Diophantine Equation for Integral Powers of 37, International Journal of Mathematics and Computer Research, Vol 12, No. 1, 2024, 3996-3998
44. A. Dinesh Kumar, R. Sivaraman, Ramanujan Summation for Pascal's Triangle, Contemporary Mathematics, Vol 5, No. 1, 2024, 817-825
45. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study on Professional Competence of Mathematics Teachers in Higher Secondary Schools, International Journal of Multidisciplinary Research and Modern Education, Vol 10, No. 1, 2024, 40-44
46. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study on Job Satisfaction of Mathematics Teachers in High Schools, International Journal of Engineering Research and Modern Education, Vol 9, No. 1, 2024, 15-20
47. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, Social Maturity of Under Graduate Students of Mathematics Group, International Journal of Current Research and Modern Education, Vol 9, No. 1, 2024, 11-16
48. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study on Teaching Effectiveness of Mathematics Teachers", International Journal of Scientific Research and Modern Education, Vol 9, No. 1, 2024, 33-37
49. A. C. Lal Kumar, A. Dinesh Kumar, M. Vasuki, A Study of Occupational Stress towards Higher Secondary Teachers of Mathematics, International Journal of Applied and Advanced Scientific Research, Vol 9, No. 1, 2024, 17-22