

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
P.M.B 65, MINNA, NIGER STATE, NIGERIA



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TABLE OF CONTENTS

1. Rethinking Curriculum Issues IN TVET and Science Education in the 21st Century **Professor Simon M. Yalams** Department of Vocational and Technology Education Faculty of Technology Education Abubakar Tafawa Balewa University, Bauchi. **1**
2. Electrical/Electronic Technology Education Implementation of the Curriculum Challenges in Oyo State's College of Education. **Adedeji, Soji Aderemi PhD.** (Technical Education Department, School of Vocational and Technical Education, Emmanuel Alayande College of Education, Oyo, Oyo State. **16**
3. Curriculum Innovation in Mathematics: A Remedy to Contemporary Issues in Science and Technology Education. **Isiyaka Maidabo Lawal.** (Department of General Studies in Education, School of General Education Federal College of Education Kontagora, Niger State.) **23**
4. Curriculum Issues in Biology Education and Food Security in Nigeria in 21st Century. **Muhammad Danjuma.** (Biology Department School of secondary education (sciences) Federal college of education, katsina). **29**
5. The Influence of School-Location, School-Size, Gender-Difference and Teacher-Variable on the Performance of Secondary School Students in Gombe State. **Abdullahi Salami Magaji.** (Federal College of Education (Technical) School Of Science Education, Mathematics Department Gombe, Gombe State.). **36**
6. Effect of Improvised Furnace on Students' Achievement and Retention in General Metalwork in Technical Colleges in Katsina State. **BalaK., Garba, B. F. and Yusuf, A. S.**(Department of Metalwork Technology, School of Secondary Education Technical, Federal College of Education (Tech).Bichi, Kano. **44**
7. Level of Availability and Utilization of Science Laboratory Equipment as Perceived by Secondary School Science Teachers and Students in Bosso Metropolis, Niger State. **Eze, I. E., Luka, S. S., Koroka, M. U. S., Ambrose, A. & Odeje, J. C.**(Department of Science Education, Federal University of Technology, Minna, Niger State.) **56**
8. Curriculum Issues in School Management and Administration. **Samuel Adekunle Meseko.** (Department of Educational Foundations and Management Federal College of Education Kontagora, Niger State.). **64**
9. Assessment of Students' Interest in Curriculum Innovation in Secondary Schools in Minna Metropolis, Niger State. **Bawa, Saratu; Laka, A.U.; Bauchi, U.S & Abuja, M.**(Science Education Department, Federal University of Technology Minna). **70**
10. An assessment of the Application of Peer Group Guided Inquiry in Solving, Learning and Retention in Biology among Senior Secondary Schools in Minna Metropolis. **Alamu J.O, Isah U, Ochigbo F. I, Juman S.** (Department of Science Education, Federal University of Technology Minna, Niger State.) **77**

11. Gender Perception of the Use of ICT for Classroom Instruction among Biology Teachers in Minna Metropolis of Niger State. **Olalere, J., Adekojo, V. O., Shopelu, B. O., Mary, J. N., & Koroka, M. U. S.** (Science Education Department, Federal University of Technology Minna, Niger State). **83**
12. Status of Science Education and the Challenges of its Curriculum Implantation in Nigeria: Matter Arising. **Aisha Hassan Sulaiman.** (Department of Arts and social Science education Yusuf Maitama Sule University, Kano). **92**
13. Assessment of Information and Communication Technology (ICT) Skills and Academic Qualification of Library Personnel on Information Service Delivery in University Library in Ogun State, Nigeria. **Onyenuloya, V.O., Bitagi, A. Ph.D&Prof. Oyedum, G. U.** (Department of Library and Information Technology, Federal University of Technology, Minna). **100**
14. Influence of Accessibility, Competency and Use of ICT on Knowledge Sharing among Librarians and Library Officers in Federal Universities in North Central Nigeria **Surajudeen Shola Yusuf, Ahmed Abduganiy Okanla, PhD & Philip Usman Akor, PhD.**(Kwara State Library Board, Ilorin – Kwara State, Federal University of Technology, Minna – Niger State). **109**
15. Utilization and Relevance of Educational Curriculum in Sustaining Peace and Stability among Teachers and Students in Nigeria. **Aminu Ibrahim.** (Department of Curriculum and Instruction Adamu Augie College of Education, Argungu, Kebbi State). **120**
16. Application of Scaffolding Techniques in the Improvement of Teaching and Learning of Contemporary Biology Concepts. **Laka, A. U.; Akeme, A.F.; Abbas, L., Abuja, U. M. & Adeniyi, K.A.** (Department of Science Education, Federal University of Technology, Minna, Nigeria). **127**
17. Enhancing Electrical/Electronic Technology Curriculum Through Proper Application of Information and Communication Technology. **Dr. Lasisi Basiru Toyin**(Technical Education Department School of Vocational and Technical Education Emmanuel Alayande College of Education, Oyo, Oyo State). **132**
18. Effect of 7ES Model of Constructivist Instructional Strategy on Interest of Students in Secondary School Biology in Kogi State. **Negedu, S.A (PhD), Ochijenu, M.A. & Olorunshola, S.O.** (Department of Science Education, Kogi State University, Anyigba, Kogi State). **142**
19. Curriculum of Mathematics Education; Problems and Prospects. **Olorunmaiye Ebun-Oluwa Olushola.** School of General Education Department of General Studies in Education, Federal College of Education, Kontagora, Niger State. **153**

20. Development and Validation of Economics Teacher-Made Test for Authentic Assessment of Students' Achievement in North Central States of Nigeria. **Allahnana, Kwanza Maikudi; Akande, Martina Taiwo; Uwelo, Danladi & Prof. I J. Kukwi.** (Department of Educational Foundations Faculty of Education, Nasarawa State University, Keffi, Nigeria., Department of Educational Foundations Faculty of Education, Nasarawa State University, Keffi, Nigeria; Department of Educational Foundations, Faculty of Education, Nasarawa State University, Keffi, Nigeria & Department of Educational Foundations, Faculty of Education Nasarawa State University, Keffi, Nigeria. **158**
21. Quality Teaching for Meaningful Learning of Basic Science and Technology Concepts with Computer Animation Strategy in 21st Century. **Sani Alhaji Umar & Wuyep Simvyap Lar.** (Department of Science Education, Federal University Kashere, Gombe). **170**
22. Influence of Analogy-Based Teaching on the Students' Attitudes Toward Chemical Equilibrium Among Secondary Schools in Nguru, Yobe State, Nigeria. **Idris Ibrahim and Mohammed Nafisa Nalado.** (Department of Science Education, Federal University of Kashere, Gombe State). **178**
23. Influence of Science Process-Skills Acquisition on Creativity among Secondary Biology Students in Zaria-Nigeria, for Science Education Advancement in the 21st Century. **Sadiq, Usman, F.K. Lawal & Adamu Mohammad, Fagge.** (Department of Science Education, Ahmadu Bello University, Zaria, Department of Science Education, Ahmadu Bello University, Zaria & Department of Integrated Science, Sa'AdatuRimi College of Education, Kano.). **185**
24. Factors Affecting the Implementation of Pre-School Science Curriculum in Nigeria. **Girgi Peter fayum & Tombowua Sooter.** (Primary Education Department College of Education, Katsina-Ala, Early Childhood Care and Education Department College of Education, Katsina-Ala). **195**
25. Impact of Convergent and Divergent Learning Styles on Chemistry Achievement and Motivation among Secondary Students in Bida Local Government, Niger State. **Yakubu, A. A., Ezenwa, V. I., Wushishi, D. I. & Jonathan, Y.** Department of Science Education, School of Science and Technology Education, Federal University of Technology, Minna Niger State, Department of Chemistry, School of Physical Sciences & Federal University of Technology, Minna Niger State. **206**
26. Integration of Apprenticeship Scheme into the NCE (Technical) Curriculum Programme towards Self-Reliance in The 21st Century. **Dopemu Olushola Afolabi, Jiya Umar Mohammed, Dr. Idris I. M & Dr. Rufai Audu.** Department of Automobile Technology Federal College of Education (Technical), Bichi – Kano State, Nigeria, FCT Department of Science & Technology Utako – Abuja & Department of Industrial and Technology Education Federal University of Technology, Minna - Niger State, Nigeria.). **216**

27. Assessment of Technical Education Teachers' Competency in Curriculum Development Skills for Delivery in the 21st Century in Tertiary Institution in Benue State. **Agada, Ameh Michael, Francis Oche Atama & Doowuese Adaga.**(Department of Vocational and Technical Education Abubakar Tafawa Balewa University, Bauchi; Bishop House, Catholic Diocese of Otukpo & Department of Vocational and Technical Education Abubakar Tafawa Balewa University, Bauchi. **224**
28. Stakeholders' Perception on Barriers to and Enablers of Innovations in Motor Vehicle Mechanic Work Curriculum in Nigeria. **Arah, A. S., Azuma, O.K., Adeyefa, M. A., Audu, R. & Mohammed, A.**(Department of Automobile Technology, Vocational Enterprises Institute, Karshi, Abuja, Nigeria; Department of Technology and Science, Federal Ministry of Education, Abuja, Nigeria; Department of Fisheries Technology, Federal College of Freshwater Fisheries Technology, New Bussa, Nigeria & Department of Industrial and Technology Education, Federal University of Technology, Minna, Nigeria. **234**
29. Curriculum Innovation in Technology Education: The way Forward. **Sa'atu, M.A; Jude, K.; Sani, Y. & Kagara A. B.** (Department of Industrial and Technology Education School of Science and Technology Education Federal University of Technology Minna). **243**
30. Development and Evaluation of Virtual Learning Environment for Learning Selected Technical Drawing Concept in Ilorin Metropolis. **Sanni, Tunde Abdulrahman & Sulaimon, Ismail Adekunle.** (Department of Industrial & Technology Education, Federal University of Technology Minna, Niger State Nigeria. **251**
31. Language Education Curriculum in Nigeria's Multilingual Context: Challenges and Prospects, **Ahmed Mohammed Sadik.** (Department of Communication & General Studies Federal University of Technology, Minna.). **264**
32. Learning About and Understanding Different Interpretations of Fractions and their Role in the Primary School Curriculum. **Aliyualhaji Zakariyya (Ph.D), Abubakar Bello SADIQ (Ph.D) & Kure DANJUMA.** Department of Mathematics, Niger State College of Education, Minna, Department of Mathematics, Federal College of Education, Yola& Department of Science Education, Ibrahim Badamasi Babangida University, Lapai, Niger State. **269**
33. Instructional Issues in Implementing Computer-Assisted Component of Senior Secondary School Technical Drawing Curriculum in Benue State. **Ukoha, Ukoha Akuma., Upwa, Fanen Emmanuel, Shitmi, L.N.& Hwande, T.** (Department of Industrial Technology Education Michael Okpara University of Agriculture, Umudike, Abia State; Department of Vocational & Technical Education, Benue State University, Makurdi& Department of Basic Studies Plateau State College of Agriculture, Garkawa. **276**
34. Assessment of Factors for Successful Implementation of Technology Education Curriculum in Secondary Schools in Plateau State. **Shitmi, Longkoom Nicholas; Nwokolo-Ojo, Joy & Upwa, Fanen Emmauel.** Department of Basic Studies Plateau State College of Agriculture, Garkawa& Department of Vocational & Technical Education Benue State University, Makurdi. **287**

35. Effects of Blog and Microblog on College of Education Pre-Service Teachers' Agricultural Science Learning Outcomes in Lagos State. **Ofoka, Eunice. Chinwe., Gambari, I. A & Alabi, T. O.** (Education Technology Department, School of Science and Technology Education Federal University of Technology Minna. **298**
36. Pre-Service mathematics teachers' perspective about learning Geometry using van Hiele's phase-based teaching strategy: A case study of Niger State College of Education, Minna Nigeria. **Hassan Usman, WunThiam Yew, Kure Isah Danjuma and Bashir Ahmad Usman.** (College of Education, Minna, Nigeria, School of Educational Studies Universiti Sains Malaysia 'Department of Sci Education, Ibrahim Badamasi Babangida University, Lapai, Nigeria, Department of Science Education, Federal University of Technology, Minna, Nigeria. **308**
37. Survey of Lecturers' Attitude, Competence and Utilization of Result Compiler Software (RCS) in Federal University of Kashere, Gombe State, Nigeria. **Bello, Ahmed, Ibrahim Abubakar Bello, Shahid, Sani Anka & Alleh, Roland Omokafe).** (Department of Science Education, Federal University Kashere, Gombe State, Nigeria; Department of Technology & Vocational Education Training Faculty of Science & Technology Education Kano University of Science & Technology Wudil, Kano State, Nigeria & Department of Office Technology and Management Abdu Gusau Polytechnic, Talata Mafara, Zamfara State, Nigeria & Department of Educational Technology, Federal University of Technology Minna, Niger State, Nigeria. **315**
38. Enhancement of Tertiary Institutional Workshop and Practices as a Strategy for Increasing Innovations in Technology Education. **Abdulganiyu O. Balogun, Odesanmi Atinuke & Isah Aliyu Mohammed.** Department of Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi. School of Vocational and Technical Education, Abubakar Tatari Ali Polytechnic, Bauchi.; Department of Technical Education. Modibbo Adama University of Technology, Yola. Abubakar Tafawa Balewa University, Bauchi. & Department of Vocational and Technology Education, Abubakar Tafawa Balewa University, Bauchi. & School of Vocational and Technical Education, Abubakar Tatari Ali Polytechnic, Bauchi. **328**
39. Curriculum Issues and Current Trends in Wood Work Technology. **Shiitu, B. K., Adamu, A. A., Okwori, R. O., Hassan, M. A. & Mohammed, B. M.** (Department of Woodwork Technology Education, Federal College of Education (Technical), Gusau, Nigeria; Department of Woodwork Technology Education Niger State College of Education, Minna, Nigeria & Department of Industrial Technology Education Federal University of Technology, Minna. **336**
40. Effects of Laboratory Technique Enriched with Safety Training on Interest and Performance Towards Practical Biology Among Secondary School Students in Lere, Kaduna. **Danjuma Sunday Ya'u Ahmad & Yusuf Muhammad Hayatu.** (Department of Science Education, Ahmadu Bello University, Zaria-Nigeria, Department of Science Laboratory Technology, Nuhu

- Bamalli Polytechnic, Zaria-Nigeria, Department of Science Education, Ahmadu Bello University, Zaria-Nigeria). **344**
41. Good Governance: The Pivot of Achieving Quality Primary Education in the 21st Century for Sustainable National Development. **Haruna Sheidu**. (Department of Social Studies, Federal College of Education, Katsina.). **354**
42. Youth Empowerment for Poverty and Unemployment Reduction in the 21st Century for Sustainable National Development. **Suleiman Jibril Samaila**(Department of social studies Federal College of Education, Katsina.). **364**
43. Critical Perspective on Social Studies Education Curriculum in Nigeria: Problems and Prospects **Muhammad Abubakar Giwa**Department of Social Studies, School of Senior Secondary Education, Arts and Social Sciences Federal College of Education, Katsina. **374**
44. Effects of Computer Drill, Practice and Demonstration Strategy on Junior Secondary School Students' Basic Science Achievement In Abuja. **Prof. (Mrs) Nsofor, C.C.; Dr. (Mrs) Umeh, A. E. & Adalikwu, M.T.** (Department of Educational Technology, Federal University of Technology, Minna). **380**
45. Awareness of Science Teachers in Science and Technical Schools About Nanoscience and Nanotechnology In F.C.T Abuja. **Aji, Elias Omoniyi; Celina, Shitnan Gana & Ramatu, Wodu Gimba.** (Department of Science Education, Federal University of Technology, Minna.). **388**
46. Influence of Utilization of Electronic Information Resources on Academic Performance of Postgraduate Students in Federal Universities in North Central Nigeria. (**Alao A. S.; Prof. P. U. Akor & Prof. J. N. Udensi**). (Department of Library and Information Technology, Federal University of Technology, Minna, Nigeria.). **398**
47. Occupational Standards in Industries: The Need for TVET Curriculum Review. **Ojeme Jennifer Aloiseghe & Ogbenna Mavis Ndid.** (Department of Industrial and Technology Education Federal University of Technology, Minna, Nigeria). **413**
48. Curriculum Issues and Innovations in Technology Education in the 21st Century for Sustainable Development in Nigeria. **Abdullahi Saidu, Muhammad Aliyu Vatsa, Zinabe Paul Zeyeme**(Department of Building Technology, Niger State College of Education, Minna., Department of Metal Work Technology, Niger State College of Education Minna. Department of Industrial and Technology Education, Federal University of Technology, Minna.). **424**
49. Policy Priorities and Challenges of Implementation of Innovations and Curriculum Development for Technology Education in Nigeria. **Alome, Sunday Adah & Umaru, Nathaniel.** (Industrial and Technology Education Department, Federal University of Technology, Minna.). **433**

50. Curriculum Issues in Science Education: Bridging B.ED Primary Education - Science and Primary School Science Curricula. **Geoffrey Aondolumun Ayua & Alhaji Bida Danjuma.** (Science Education Unit, Department of Curriculum and Teaching, Benue State University, Makurdi, Nigeria & Department of Physics Niger State College of Education, Minna, Nigeria.) **442**
51. Improving Creativity and Academic Performance of Secondary School Students in Organic Chemistry Concepts through Contemporary Teaching Strategies. **Ematum Ramatu Umahaba & Prof. Dantani Ibrahim Wushishi.** (Ahmadu Bello University Department of Science Education. Federal University of Technology, Minna, School of Science and Technology Education). **449**
52. Effect of Jigsaw-IV Cooperative Learning Strategy on Performance in Air Pollution Among Upper Basic Science Students in Zaria, Kaduna State, Nigeria. **Adamu Mohammad, Fagge & Salisu, HADI.** Integrated Science Department, SaadatuRimi College of Education Kumbotso, Kano; Social Studies Department SaadatuRimi College of Education Kumbotso, Kano. **458**
53. Adopting Innovative Strategies to Improve the Quality of Teaching and Learning of Basic Science and Technology in Junior Secondary Schools in Kano State. **Muhammad S. Usman.** (Department of Integrated Science Sa'Adatu Rimi College of Education Kumbotso, Kano). **473**
54. Curriculum Issues and Innovation in Technology Education in the 21st Century. **Owolabi Sunday Oluwatosin & James Chata Salawu.** (Federal College of Education (Technical) Bichi Kano State & Niger State College of Education Minna). **480**
55. Pragmatic Approach to TVET as a Way Forward to Security Challenges in Nigeria. **Gazali, S. A., Kareem, W. B., Abdullahi, S. M., Onuh, J. Abdurahaman, T. S.** National Examinations Council, Minna.; Department of Industrial and Technology Education, Federal University of Technology, Minna.; Kano University of Science and Technology, Wudil, Kano State; Department of Science and Technology, Faculty of Education, University of Jos & Department of Educational Technology, University of Ilorin. **488**
56. Impact of E-Learning On Retention and Academic Performance of Junior Secondary Schools Students in Social Studies in Kaduna State Nigeria. **Kamarudeen Ja'afar Madauchi.** (Department of General Studies Education, Federal College of Education, Zaria-Nigeria). **495**
57. Assessment of the Implementation of Basic Science and Technology Curriculum in Junior Secondary Schools, Niger State. **Owodunni A. S., Tukura, C. S. & Banjo, I. O.** (Department of Industrial and Technology Education, Department of Educational Technology, Federal University of Technology, Minna, Niger State, Nigeria). **504**

58. Impact of School Facilities and Maintenance on Science Teachers' Job Performance in Senior Secondary Schools in Gwagwalada Area Council, Abuja. **Abdullahi, D. A & Bello, M. R. & Bauchi, U. S.** (Department of Basic Science FCT, Zuba, Abuja & Department of Science Education, School of Science and Technology Education, Federal University of Technology, Minna, Niger State.). **514**
59. Impact of Technical Education Curriculum on Entrepreneurial Skills of Colleges of Education Graduates in North-Central Zone, Nigeria. **Musa, S.; Mohammed Z. & Tukura T.** (Government Commercial College, SabonBwari, Niger State., CPES, Federal University of Technology, Minna, Niger State & Paikoro Local Education Authority, Niger State. **521**
60. Inclusion of Robotic Welding Contents into Metal-Work Technology Education Programme in the Nigeria certificate in education curriculum. **Ogundele, Alexander Gbenga.** (Department of Industrial and Technology Education, Federal University of Technology, Minna, Niger State. School of Technical Education / Metalwork Technology Department, Kwara State College of Education (Technical), Lafiagi.). **531**
61. Curricular Implications of Teaching Science Mathematics and Technology Education in Mother Tongue in Nigeria's School System. **Dr. Bashir A. U., Dr R. M. Bello, Prof. D. I. Wushishi & Dr. Hassan Usman.** (Department of Science Education, School of Science and Technology Education, Federal University of Technology, Minna). **538**
62. Self-Efficacy and Behavioural Intention of Pre-Service Teachers towards Electronic Teaching in Niger State, Nigeria. **Falode, O. C., Nwachukwu, N. N., Ogunje, B. F. & Ilufeye, T. O.** (Department of Educational Technology, School of Science and Technology Education Federal University of Technology, Minna, Nigeria.). **544**
63. Assessment of the Implementation of Basic Science and Technology Curriculum in Junior Secondary Schools in Niger State, Nigeria. **Ahmed B. Mohammed, Oladipupo Olamyi Samuel, and Adewal Adeshina Agbenla.** (Niger State Polytechnic, Zungeru Technical Services Department, Scientific Equipment Development Institute, Minna). **555**
64. Curriculum Development and Implementation in Nigeria: Challenges and Issues **Omaku John; Ossai, C. G. & AHMED, H. O.** (OkeneKogi, Nigeria. Federal College of Freshwater Fisheries Technology, New Bussa Niger State, Nigeria. Number 23 Ikuehi Close G.R.A Okene Kogi State, Nigeria). **564**
65. Assessment of Mathematics Teacher Factors towards the Use of Web-Based Resources for Teaching in Secondary Schools in Niger State. **Abuh, A.Y; Ibrahim, I.K. & Alabi, T.O.** (Department of Educational Technology, School of Science and Technology Education, Federal University of Technology, Minna, Niger State, Nigeria). **572**
66. Teaching-Learning-Based Optimization (TLBO) Algorithm for Enhanced Curriculum Evaluation: A Feasibility Study. **Ibrahim M. Abdullahi & Hauwa K. Muhammad.** (Department of Computer Engineering, Federal University of Technology, Minna, Niger State, Nigeria & Department of Educational Administration and Planning, FatiLami Abubakar Institute for Legal and Administrative Studies, Minna, Niger state, Nigeria). **583**

67. Investigation into the Level of Awareness and Compliance With Road Signs Among Drivers in Abuja Metropolis. (**Abdulkadir, M; Amos, P; Ayoko, S.O; Nma, T.N Lawal, H. O & Mustapha, A**) Department of Industrial and Technology Education, Federal University of Technology, Minna, Niger State, Nigeria. **591**
68. Electrical and Electronics Technology Advancement: The Need for Curriculum Innovations **Abdulsalam S. O., Akor O. A., SaiduH. A., Abdulmalik S.** Plot 32 Providence Street Phase IV, Nyanya-Abuja, Nigeria. AA1 KayadaKuje Area Council F.C.T, Nigeria.; Department of Electrical/Electronics, Federal College of Education (Technical) Gusau, Zamfara State, Nigeria. No. 11 Umar Dikko Street BossoMinna, Niger State, Nigeria. **599**
69. Curriculum and Industrial Demand: A Tool for Industrial Efficiency. **Mohammed U.K, Katken, K.K., Adamu M.D. & Igwe, C.O. Ph.D.** (Dept of Voc. And Tech. FGGC Abaji-Abuja, ²Plot 374 Sagwari layout Dutse Abuja ³Niger State Housing Co-operation Minna, ⁴Indus. And Tech. Edu. Dept. FUT Minna). **604**
70. Coping With Behavioural Challenges of Teaching Large Classes in Industrial and Technical Education in Tertiary Institutions. **Gbile Samuel Luper.** (Department of Industrial and Technology Education. Federal University of Technology, Minna. Niger State. **Bake Cornelius & Usman Baba Abubakar.** Vehicle Inspection Office Minna, Niger State & Department of Vocational and Technical Education, College of Education, Akwaga. Nassarawa State. **611**
71. Curriculum of Industrial and Technology Education (ITE) Programmes and the Challenges of Industrial Demand. **Muhammad Samaila, Muhammad Bello & Emmanuel Yusuf.** (Local Education Authority Funakaye, Gombe Nigeria; Sahco, NnamdiAzikiwe International airport, Abuja Subeb T/Balewa, Nigeria. **619**
72. Skill Improvement Needs of Lecturers for Effective Teaching of Automobile Technology Education in North Central Nigeria. **Mautin Gangbe, Ogunleye; Uthman Olabode; Maryam Adamu Muazu & Dr. Audu, R.** (Gosmate Global Academy, No. 18, Utuh Street Araromi Quarters, Mile 12, Lagos State; Usmy Global Multipurpose Ventures, No. 7, Ogunleye Street, BlcBiket Hospital, Oshogbo, Osun State. C/O Rabiou King, F10, EbituUkiwe Street GRA, Minna, Niger State. Department of Industrial and Technology Education, Federal University of Technology, Minna, Niger State, Nigeria. **626**
73. The Prospects and Challenges of Electrical and Electronics Technology Teachers in Nigeria. **Abdulsalam B. Abdulmajeed, Lucky Uduokhai & Victor Maimutani Yusuf.** (Department of Industrial Technology Education, Federal University of Technology Minna, Nigeria. **635**
74. Education and National Security: Challenges and Way Out. **Muhammad Buhari Ibrahim, Omodun Joseph Kehinde, & Bade Nehimiah.** (Darussalam Behind PenielAlbarka Plaza Minna, Community Secondary School Lade PatigiKwara State, & Department of Science and Technology Education Federal University of Technology Minna). **643**

75. Curriculum Development and Innovation in Technology Education in Nigeria. **Bako Yari Zachariah, Nasiru Musa Zarewa & Garba Umar.** (Federal Government Girls' College Abaji, Garki-Abuja; Zarewa Primary School, Rogo LGEA, Kano State. & Niger State Polytechnic Zungeru.). **651**
76. STEM: A Panacea For Curriculum Issues in Science and Technology. **Ojonugwa, E.A., Ibitoye, D.D., & Ekhalia, B. J.**(No. 15, New Layout, Lokoja, No. 3, God's Own Str. DutseBaupma, Industrial and Technology Education Dept. FUT Minna). **666**
77. Strategies for Improving Effective Delivery of Technical and Vocational Education and Training Through Curriculum Planners, in Nigeria. **Oloruntoba, Gabriel; Ubanwa S. C.; Baba, Yakubu & Alawode, Opeyemi Dolapo**(Industrial and Technology Education Department Federal University of Technology, Minna; Gp 986 Otokiti Village Housing Estate Lokoja, Kogi State, Nigeria. Police Secondary School PMB 178 Minna, Niger State, Nigeria.; AminuSaleh College of Education, Azare, Bauchi State, Nigeria., & Federal University of Technology, Minna, Nigeria). **671**
78. Impact of Land Excavation on The Environment and Health of the Residents of Obajana, Kogi State, Nigeria. **Ajoge, Isah Mohammed & Mairo Muhammed** (Department of Geography, Federal university of Technology, Minna, Nigeria). **679**
79. Science and Technology Education Curriculum in Nigeria: Issues, Challenges and the Way Forward. **Suleiman Itakure Asma'u & Victor Kayode Ojomoh** (F.C.T – College of Education, Zuba, Abuja). **687**
80. Curriculum in Technical and Vocational Education and Training for the Sustainable Development Goal in Nigeria. **Salihu, H.O.Joseph; I. J. Kuta. &Bomoi J. I. Muhammed.** CEO at Twin Conceptual Metalworking Technology, Federal Polytechnic Bida, Electrical Department & Yobe State College of Agriculture. **694**
81. Evaluation of the Implementation of Technical Education Curriculum in Technical Schools in Niger State. **Abdullahi Shaba Mohammed, Mamuda Hammalakun, Abedoh Ahmed Yakubu, Nmadu John & Lahsin Nanpon Daniel** (Scientific Equipment Development Institute Minna, Department of Higher Education, Asokoro, Abuja, Department of Science and Technology, Asokoro, Abuja, Department of Science and Technology, Federal University Ndufu-Alike Ikwo, Ebonyi State, Department of Science and Technology, Asokoro, Abuja). **702**
82. The Role of Information and Communication Technology-Based Curriculum in the Realization of the Objectives of Vocational and Technical Education Programme in Nigeria Tertiary Institutions. **Femi Ogunsola, Atsumbe, B.N., Nwokolo-Ojo, Joy Obiageli and Francis Abutu.** (Department of Industrial & Technology Education, Federal University of Technology, Minna. Department of Vocational & Technical Education, Benue State University, Makurdi). **709**

83. The Problems and Prospects of Biology Education Curriculum Development in Nigeria Beyond 2020. **Aisha Mohammed & Bawa Saadatu Mohammed** (Department of Biology, Niger State College of Education Minna & Department of Biology, Niger State College of Education, Minna). **718**
84. Appraisal of E-Readiness of NCE Technical Teacher Training Institutions in North-Eastern Nigeria. **Abdumumini Aliyu Cheledi, Magaji Adamu & Adamu Bashir** (School of Vocational & Technical Education, Abubakar Tatari Ali Polytechnic, Bauchi). **724**

EFFECTS OF BLOG AND MICROBLOG ON COLLEGE OF EDUCATION PRE-SERVICE TEACHERS' AGRICULTURAL SCIENCE LEARNING OUTCOMES IN LAGOS STATE

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ABSTRACT

This study investigated the effects of blog and microblog on College of Education pre-service teachers' agricultural science learning outcomes in Lagos State. The study adopted pre-test, post-test non randomized quash experimental designed. The population for the study was 229 agricultural science pre-service teacher in Lagos State Nigeria were used for the study. Intact class of 117 pre-service teacher year two (42 male and 75 female) in four schools were assigned to experimental group one, two, three and control group respectively. The research was guided by two research questions and two null hypotheses tested at 0.05 level of significant. The researchers used Blog, Facebook, WhatsApp Learning Platforms and Lecture method on Agricultural science concepts, which was used as treatment material for experimental group one, two and three while lecture method was used for control group. A pilot study was carried out to test reliability of the research instruments on 12 pre-service teacher year two from National Teachers Institution Kaduna, Lagos Branch. A reliability coefficient of 0.81 was obtained using the test-retest method on Agricultural Science Achievement Test (ASAT) and analysed used Pearson Product Moment Correlation. Thirty (30) multiple choice item questions were administered to both groups before and after the treatment as pre-test and post-test. The data collected was analysed using descriptive statistics (mean and standard deviation) to answer the research questions while inferential statistics (ANCOVA and ANOVA) statistics was used to test the hypotheses. The findings of the study revealed that there was significant difference in the mean achievement scores of Pre-Service teachers taught Agricultural Science concepts using Blog, Facebook and WhatsApp Platforms and Lecture Method. Also gender was not significant in the mean achievement of Blog Learning Platform group Based on the findings, the study recommends among others that Blog, Facebook WatsApp leaning platforms should be used for instructional delivery in the schools, so that students can learn, at their own pace, in order to improve students achievement.

Key Words: Blog Learning Platforms, Facebook Leaning Platforms, WatsApp Leaning Platforms and Achievement

Introduction

Technological advancement has greatly influenced the use of various media in teaching and learning especially in a social environment. One of the remarkable achievement of technology is communicating through social networks. Social networks are websites that enables an individual to connect with friends and families, share photos, videos, music and other personal information with either a selected group of friends or a wider group of people depending on the setting selected. King (2014) opined that technology has revolutionized the way humans communicate. A social networking service is an online service platform or site that focuses on facilitating the building of social networks or social relation among people who for example

share interest, activities, backgrounds and real-life connection (Effiong & Odey, 2013). Social networking which also referred to as social media encompasses many Internet based tools that makes it easier for people to listen, interact, engage and collaborate with each other. One major milestone in the history of the Internet has been the development of blogging and micro-blogging sites and these Internet connections are web-based. Tim Berners bee, the inventor of the worldwide web, sees it as place where people could share information through a series of hyperlinked pages. It is also a place where only technically skilled users would create content especially for information, entertainment and education purpose such as teaching and learning. The effectiveness of teaching and learning largely depends on methods adopted and also educational tools used during teaching and learning process. There are many tools and networks that could be potentially used in academics for effective teaching and learning especially in higher education. Andy (2017) reviews the latest social media for academics and also provides the method on how to use them in teaching and learning process. These tools are academic.edu, Auto collage, cover it live, create space, crowd booster, Diaspora, Doodle, Drop box, Ever note, Explain everything, WhatsApp, Facebook, Google +, Google drive, Google scholar, Instagram, Liver stream, Moodle, my space, pad let, Tumblr, Twitter, YouTube, Weblog, among others. These academics social media tools can be used in teaching and learning process by creating or designing blogs and micro-blogs sites.

Blogs and Micro-blogs sites can be described as web journals. Blog content is unlimited while micro-blog is limited or short often to 140-200 characters per post. Ellison and Wu (2008) explained that a blog is an online diary with series of updates in chronological order, usually written in informal style in which students or teachers post an information or topics of interest in order to interact or communicate with each other. A blog site is a website that also allow students to post materials such as video or graphics, record opinion and information on regular basics, enter commentary, description of events that are designed to be used as online diaries collected chronologically without character limit. Its owner has the freedom to express his opinions about one or more topics. Blogs encourages students to write and read a topic they wish and make their comments.

Microblogging platform is one of the recent social media of web 2.0. It is a web-based platform that became one of the knowledge management scheme in the web 2.0 world. It allows the user to publish brief text, instant messaging, text message from all phones, e-mail, mp3 or the web information updates and exchange. Microblogging which is also known as Nano blogging enables its users to send and published short messages (about 140 characters) and is usually text and regular respond to questions. The updates are displayed on the users' profile page and are also immediately sent to other users who have chosen the option of receiving them.

Zhang (2010) explained that microblogging provides a light-weight and easy tool to post brief update about activities and support knowledge sharing and communication in academic setting. The user can restrict the sending of these messages only to members of the circles or friends or allowed its access to all users which is the default setting. Carmen (2017) argued that microblogging platform in education can be used by the students to send and receive message via the web, short message service, instant messaging among others. Microblogging platform specially designed for education is called cirip.ro, offers facilities such as live video, audio messages, multimedia objects embedding, private and public groups, deed monitoring.

In higher education, Facebook and WhatsApp platforms are used to make announcements, post assignment and remind students about important and latest information (Jeff, 2011). These platforms help students to upgrade, update, build good rapport, contact and engage themselves

in learning. The platforms are easier and more direct way for students to communicate with fellow students, ask and answer questions on homework or assignments by posting the questions on a group chat when connected. Since students learn from others, having shared their learning experiences they gain a lot of insight and understand the topic faster. The examples of micro- blogging are Facebook.com, WhatsApp among others. The micro-blogging site such as Facebook and WhatsApp with their features can be used in teaching and learning since it encourages collaboration among teachers and learners within the school especially in learning Agricultural Science concepts.

Agricultural science is one of the courses offered at colleges of education and it comprises of soil science, animal production, crop production, and genetics among others. Ben (2014) introduced Agricultural Science is practiced for the purpose of producing food and other human needs such as clothing, shelter, medicine, weapons, tools, and ornaments among others and is likewise practiced as a business for economic gain. He explained that Agricultural science which is farming practices includes the cultivation and tillage of soil, dairying, production, growing and harvesting of any agricultural and horticultural commodities, raising of livestock or poultry and any practices performed by a farmer on a farm. The relevance of Agricultural science to human existent made it natural course for National Commission for Colleges of Education (NCCE) to include it in college of education pre-service teachers' curriculum.

Pre-service teachers are trained in the college of education to be an agent of change, they prepared to be intellectually and professionally sound, capable of discharging their professional obligation to their students in the classroom after the successful completion of their training. Sheridan (2011) described Pre-service teachers as students that have been accepted into the teachers' education program, but yet to complete requirements for full certification as a teacher. He also described pre-service teachers as 21st century teachers who are all-knowing and questionable and the ones who are continually learning, self –aware and reflective.

The negligence to adopt the newest technology in teaching and learning process in Nigerian higher institutions is one of the causes of persistent poor performance of students in tertiary institutions. This poor performance can also be attributed to many factors which includes ineffective teaching method, unqualified and inexperienced teachers, and lack of effective use of social media among others.

Guoyuan (2018) reviewed that Educational Technology prepare Pre-service teachers to transfer knowledge and skill to their future classrooms. He also stated that Pre-service teacher's education should not only focus on how to use technology, but also how technology can be used for teaching and learning. Researchers have suggested that technology skills should be integrated throughout the teacher education curriculum in order to equip Pre-service teachers with the skills and experiences needed to apply technology to their various area of specialization. Thus the knowledge, skills, ideas and experiences that changes situation is gained through reading and studying for a specific period of time to bring out the best behaviour from the Pre-service teachers and also yield great profit and learning outcome.

Hubball and Burt (2007) described learning outcome as essential knowledge, attitudes and skills which a learner has achieved and can demonstrate at the end of a course or programme. Learning outcomes are the achievement of the learner and minimum performances that must be achieved to successful completion of a course or programme. In this study, learning outcome includes achievement.

Achievement has been defined differently by several scholars, but generally, achievement is the product of learning after one has been exposed to a particular treatment. Ndako (2017) defines Achievement as outcome that shows the extent to which a student, teaching or institution has achieved their educational goals.

Unfortunately, there have been gender disparities in pre-service teacher academic achievement in Lagos State. Kolawole (2007) found that male students achieved significantly better than female students in science education agricultural science in particular. Ilobeneke, Alabi, Falode & Kur (2018) who investigated the effectiveness of Facebook and WhatsApp supported instructional platforms on undergraduate students' achievement in educational technology. Findings revealed that significant difference exist in mean achievement of Facebook, WhatsApp and Lecture Method.

Gambari and Shittu, (2016) who investigated the effectiveness of blended learning and E-learning modes of instruction on the performance of undergraduates. Findings of the study showed that there was significant difference in the performance of the three groups in favour of Experimental group 1 (Blended learning).

Aicha (2014) who investigated the impact of using WhatsApp mobile learning activities on the achievement and attitudes of online students using mobile devices at the university. The results revealed that experimentation show that there are significant differences, at 0.05 alpha level, in the achievements and attitudes of the experimental group compared with the control group.

Isreal (2007) who investigated the effect of video-taped instruction in the teaching of history. The result of the ANCOVA statistical analysis revealed that gender was not a significant factor on students' achievement in history, when video-taped instructions are used.

In another development, Jimoh, Alabi, Falode & Olayiwola (2018) who investigated the effect of three modes of mobile instructional package on retention and gender of mathematics students in colleges of education, in North-Central Nigeria. The findings of the study revealed that there was no significant difference in the achievement and gender of mathematics student taught using Video Only, Audio+Text and Text Only.

Aim and Objectives of the Study

The aim of this study is to investigate the effects of blog and microblog on college of education pre-service teachers' agricultural science learning outcomes in Lagos State.

Specifically, the study sort to:

- (1) Determine the effect of Blog, Facebook and WhatsApp Platforms and Lecture Method on Pre-Service Teacher's academic achievement using Agricultural science concept.
- (2) Examine the influence of gender on Pre-service teacher's academic achievement in Agricultural Science concept using Blog Learning Platform.

Research Questions

The following research questions guided the study to:

1. What are the mean achievement scores of Pre-Service teachers taught Agricultural Science concept using Blog, Facebook and WhatsApp Learning Platforms and Lecture Method?
2. What are the mean achievement scores of male and female Pre-Service teachers taught Agricultural Science concept using Blog Learning Platform?

Research Hypotheses

The following hypotheses are formulated and to be tested at 0.05 level of significance.

HO₁: There is no significant difference in the mean achievement scores of Pre-Service teachers taught Agricultural Science concepts using Blog, Facebook and WhatsApp Platforms and Lecture Method.

HO₂: There is no significant difference in the mean achievement scores of male and female Pre-Service teachers taught Agricultural Science concept using Blog Learning Platform.

Methodology

The study adopted pre-test post-test randomized experimental research. The population of the study comprises all NCE pre-service teachers in Lagos State Nigeria and target population are NCE II Agricultural students. Intact class of 117 students (male =42, female=75) was used for the study from four purposively selected colleges of education based on the fact that the colleges are close to the researcher, the schools were purposively selected because Lagos state has seven colleges of education. A simple random sampling techniques was used to assign the four selected College of Education into the three experimental and one control group. Experimental group I was taught using Blog Learning Platform, Experimental group II was taught using Facebook Platform, Experimental group III was taught using WhatsApp Learning Platform while the Control group was taught using the Lecture Method. The Instruments for the study is Agricultural Science Achievement Test (ASAT) and treatment material were using Blog, Facebook WhatsApp Learning Platforms and Lecture method. The ASAT comprises of 30 multiple choice objective questions and Blog, Facebook WhatsApp Learning Platforms comprised of Agricultural lesson delivered by instructor on Blog, Facebook WhatsApp Learning Platform medium. The Agricultural Science Achievement Test (ASAT) and Blog, Facebook WhatsApp Learning Platforms were validated by three educational technology experts, the Agricultural Science Education experts and three lecturers from Agricultural Science Department College of Education, Lagos State. They determined the appropriateness of the package for teaching the chosen topics/units, clarity and simplicity of the package as well as its suitability for the level of the students, the extent to which the contents cover the topics/units they are meant to cover, possible errors in suggested answers and the structuring of the package. The test items and content of the package were corrected and modified on the basis of suggestions and recommendation of the experts. Experimental group and control were given Pretest before the treatment and after treatment posttest were administered on them. Mean and standard deviation were used to analyze the research questions while ANCOVA was used analyzed hypotheses. Conclusion it was established that there was significant difference in the mean achievement scores of Pre-Service teachers taught Agricultural Science concept using Blog, Facebook and WhatsApp Learning Platforms and Lecture Method. Also gender was not significant.

Results

Research Question One: What is the mean achievement scores of Pre-Service teachers taught Agricultural Science concept using Blog, Facebook and WhatsApp Learning Platforms and Lecture Method?

Table 4.1: Mean and Standard Deviation of Pretest and Posttest Scores of Experimental and Control Groups

Group	N	Pretest		Posttest		Mean Gain
		\bar{X}	SD	\bar{X}	SD	
Blog	32	28.40	8.00	73.82	11.94	45.42
Facebook	22	21.05	5.38	70.60	11.80	49.55

WhatsApp	33	25.87	5.96	60.90	7.13	35.03
LM	30	25.40	6.65	40.18	11.12	14.78

Table 4.1 shows the mean and standard deviation of achievement scores of experimental group one, experimental group two, experimental group three and control group in pretest and posttest. The result revealed that mean and standard deviation scores of the pretest and posttest experimental group one are $\bar{X} = 28.40$, $SD = 8.00$ and $\bar{X} = 73.82$, $SD = 11.94$ respectively. This gives a mean gain of 45.42 for of Blog Learning Platforms group. Similarly, the mean and standard deviation of the pretest and posttest of the experimental group two are $\bar{X} = 21.05$, $SD = 5.38$ and $\bar{X} = 70.60$, $SD = 11.80$ respectively. This gives a mean gain of 49.55 for the Facebook Learning Platforms group. Similarly, the mean and standard deviation of the pretest and posttest of the experimental group three are $\bar{X} = 25.87$, $SD = 5.96$ and $\bar{X} = 60.99$, $SD = 7.13$ respectively. This gives a mean gain of 35.03 for the WhatsApp Learning Platforms group. On the other hand, the mean and standard deviation of the pretest and posttest of the Lecture method are $\bar{X} = 25.40$, $SD = 6.65$ and $\bar{X} = 40.18$, $SD = 11.12$ respectively and gives a mean score of 14.78 for the Lecture method. The results revealed that experimental group one, two, three and control group had mean gain of 45.42, 49.55, 35.03 and 14.78 respectively with the experimental group one (Facebook Learning Platforms having the higher mean gain than Blog, which in turn has higher mean gain than WhatsApp Learning Platforms and Lecture method).

Research Question Two: What is the mean achievement and scores of male and female Pre-Service teachers taught Agricultural Science concept using Blog Learning Platform?

Table 4.2: Pretest and Posttest Scores of Male and Female Experimental Group Taught Agricultural Science using Blog Learning Platforms

Group	N	Pretest		Posttest		Mean Gain
		\bar{X}	SD	\bar{X}	SD	
Male	13	32.22	8.51	74.84	9.15	42.62
Female	19	25.78	6.65	73.12	13.72	47.34

Table 4.2 shows the mean and standard deviation of the pretest and posttest scores of male and female experimental group. From the result, it can be seen that mean score of the pretest and posttest score of the male are $\bar{X} = 32.22$, $SD = 8.51$ and $\bar{X} = 74.84$, $SD = 9.15$. The mean gain is 42.62 for the male. Similarly, the mean and standard deviation of pretest and posttest score of female are $\bar{X} = 25.78$, $SD = 6.65$ and $\bar{X} = 73.12$, $SD = 13.72$, the mean gain is 47.34 for the female. The female has slightly more gain score than the male.

Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

Hypothesis One: H_{01} : There is no significant difference in the mean achievement scores of Pre-Service teachers taught Agricultural Science concepts using Blog, Facebook and WhatsApp Platforms and Lecture Method.

Table 4.3a: ANCOVA Comparison of the Posttest Mean Scores of the Experimental Groups I (Blog), II (Facebook), III (WhatsApp) Learning Platforms and Lecture Method)

Source	Type III Sums of Squares	df	Mean Square	F	Sig.
Corrected Model	20293.725 ^a	4	5073.431	45.246	.000
Intercept	27220.999	1	27220.999	242.766	.000
PRETEST	8.093	1	8.093	.072	.789
GROUP	20171.790	3	6723.930	59.966	.000
Error	12558.417	112	112.129		
Total	467473.793	117			
Corrected Total	32852.142	116			

Table 4.3a shows the ANCOVA comparison of Posttest Scores of Blog, Facebook, WatSApp Learning Platforms and Lecture Method. An examination of Table 4.10a with $F(3,112) = 59.966$, $p < 0.05$, decision about hypothesis following the results of the analysis indicates that hypothesis one is rejected on the basis that the main effect (treatment) was significant. The results revealed that the Blog, Facebook, WhatsApp Learning Platforms and Lecture Method produced a significant effect on the posttest achievement scores of students when covariate effect (pretest) was controlled. The result indicates that the treatment, using Blog, Facebook, WatsApp Learning Platforms and Lecture Method accounted for the difference in the posttest achievement scores of the students. This implies that a statistical significant difference exists among the four groups of Blog, Facebook, WhatsApp and Lecture Method. Since it was established that there was a significant difference in the post-test scores of the groups, Sidak post-hoc test analysis was done to identify the direction of the difference among the treatment groups as shown in Table 4.4b.

Table 4.3b: Sidak Post-Hoc of achievement Experimental Group One, Two, Three and Control Group

	Group	Mean Diffence	Std Error	Sig	Lower bound	Upper bound
Blog	Facebk	2.922	3.132	.927	-5.466	11.309
	WhatsApp	12.812*	2.654	.000	5.704	19.921
	LM	33.493*	2.742	.000	26.149	40.837
Facebk	Blog	-2.922	3.132	.927	-11.309	5.466
	WatsApp	9.891*	3.002	.008	1.850	17.932
	LM	30.572*	3.027	.000	22.465	38.679
WatsApp	Blog	-12.812*	2.654	.000	-19.921	-5.704
	Facebk	-9.891*	3.002	.008	-17.932	-1.850
	LM	20.681*	2.675	.000	13.516	27.846
LM	Blog	-33.493*	2.742	.000	-40.837	-26.149
	Facebk	-30.572*	3.027	.000	-38.679	-22.465
	WhatsApp	-20.681*	2.675	.000	-27.846	-13.516

Table 4.3b shows the sidak post-hoc analysis of posttest mean achievement scores of students in experimental group one Blog Learning Platform, experimental group two Facebook Learning Platform and WhatsApp Learning Platform. The table indicates that significant difference exist between the mean scores of students in experimental group one Blog and experimental group two WhatsApp (Mean difference= 12.812). It also shows that significant difference exist between experimental group two Facebook and control group (Mean difference= 33.493). It also show significant difference between experimental group two Facebook and experimental group three WhatsApp (Mean difference = 9.891). Similarly, significant difference between

experimental group two Facebook and control group (LM) (Mean difference = 30.572). The implication of the analysis presented in the table 4.10b is that the use of Blog Learning Platform improve students' achievement towards Agricultural science better than Facebook Learning Platform. The use of Facebook Learning Platform can improve achievement than WhatsApp Learning Platform while the use of WhatsApp Learning Platform also improves students' achievement better than the use of Lecture Method.

Hypothesis Two: There is no significant difference in the mean achievement scores of male and female Pre-Service teachers taught Agricultural Science concept using Blog Learning Platform.

Table 4.4: ANCOVA Analysis of Achievement of Male and Female Students Scores Taught Agricultural Science Using Blog Instruction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	102.451 ^a	2	51.226	.344	.712
Intercept	11999.606	1	11999.606	80.567	.000
PRETEST	79.534	1	79.534	.534	.471
GENDER	63.461	1	63.461	.426	.519
Error	4319.244	29	148.939		
Total	178802.252	32			
Corrected Total	4421.695	31			

Table 4.4 shows the result of the hypothesis three. The hypothesis was tested using the pretest mean scores of male and female students taught using Blog Learning Platform as covariate for the analysis of Covariance. The F value of 0.426 was not significant at 0.05 alpha level that is $F(1, 29) = .426, p > 0.05$, decision about hypothesis following the result shows that there was no significant difference in the achievement of male and female students taught Agricultural Science using Blog Learning Platform. On this basis, the hypothesis three is retain. This shows that there was no statistical difference in the achievements of male and female students taught Agricultural science using Blog Learning Platform.

Discussion

There was significant difference in the mean achievement scores of Pre-Service teachers taught Agricultural Science concepts using Blog, Facebook and WhatsApp Platforms and Lecture Method. The study agree with the findings of Ilobeneke, Alabi, Falode & Kur. (2018) who investigated the effectiveness of Facebook and WhatsApp supported instructional platforms on undergraduate students' achievement in educational technology. Findings revealed that significant difference exist in mean achievement of Facebook, WhatsApp and Lecture Method. Also in support of Gambari and Shittu, (2016) who investigated the effectiveness of blended learning and E-learning modes of instruction on the performance of undergraduates. Findings of the study showed that there was significant difference in the performance of the three groups in favour of Experimental group 1 (Blended learning). The finding also in agreement the finding Aicha (2014) who investigated the impact of using WhatsApp mobile learning activities on the achievement and attitudes of online students using mobile devices at the university. The results revealed that experimentation show that there are significant differences, at 0.05 alpha level, in the achievements and attitudes of the experimental group compared with the control group.

There was no significant difference in the mean achievement scores of male and female Pre-Service teachers taught Agricultural Science concept using Blog Learning Platform. This is in

agreement with the findings of Isreal (2007) who investigated the effect of video-taped instruction in the teaching of history. The study adopted the quasi-experimental research design using video-taped instruction and conventional strategies. The result of the ANCOVA statistical analysis revealed that gender was not a significant factor on students' achievement in history, when video-taped instructions are used. The study aligned with Jimoh, Alabi, Falode & Olayiwola (2018) who investigated the effect of three modes of mobile instructional package on retention and gender of mathematics students in colleges of education, in North-Central Nigeria. The findings of the study revealed that there was no significant difference in the achievement and gender of mathematics student taught using Video Only, Audio+Text and Text Only.

Conclusion

Based on the findings of the study, it was concluded that the use of Blog, Facebook and WhatsApp learning platforms for instructional delivery is effective for teaching and learning Agricultural science.

Blog, learning platform bridge achievement gap in both male and female students in Agricultural science

Recommendations

- 1 Blog, Facebook WhatsApp leaning platforms should be used for instructional delivery in the schools, so that students can learn, at their own pace, so that it will in turn improve students achievement.
- 2 Agricultural science students should be exposed to the use of Blog, Facebook WhatsApp learning platforms in order to improve their attitude towards learning the subject.

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