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ORIGINAL RESEARCH

FOSIC2020: Science and Technology in Combating Current and Future Global Challenges (LASU Virtual Conference, 2-4 December 2020)

AbdulAzeez A. Anjorin[1], Habeeb A. Bankole[2], Oluwafunmilayo O. Ometan[3], Olusola A. Olabanjo[4], Rafiu B. Adegbola[5], Tolulope S. Ewekeye[6], Olawale L. Osifeko[7], Rilwan A. Mustapha[8], Kafayat O. Ajelara[9], Folalu A. Awe[10], Shehu L. Akintola[11]

[1]Department of Microbiology, Lagos State University, Ojo, Lagos, Nigeria

[2]Department of Biochemistry, Lagos State University, Ojo, Lagos, Nigeria

[3]Department of Physics, Lagos State University, Ojo, Lagos, Nigeria

[4]Department of Computer Science, Lagos State University, Ojo, Lagos, Nigeria

[5]Department of Botany, Lagos State University, Ojo, Lagos, Nigeria

[6]Department of Chemistry, Lagos State University, Ojo, Lagos, Nigeria

[7]Department of Mathematics, Lagos State University, Ojo, Lagos, Nigeria

[8]Department of Zoology and Environmental Biology, Lagos State University, Ojo, Nigeria

[9]Department of Fisheries and Aquatic Biology, Lagos State University, Ojo, Lagos, Nigeria

Correspondence
Shehu Lakin Akintola, Department of Fisheries and Aquatic Biology, Faculty of Science, Lagos State University, Nigeria.
Email:shehu.akintola@lasu.edu.ng

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Abstract:
Introduction: The Lagos State University 7th bi-annual Faculty of Science International Conference 2020 was held virtually from 2nd-4th December, 2020. The theme of the conference was Science and Technology in combating current and future global challenges.
Aims: To justify the theme, different sub-themes were combined cutting across biological/medical, chemical and physical sciences including: global ecology and challenges of combating infectious human and zoonotic diseases, emerging perspectives on epidemiology of infectious diseases, post COVID-19 effects on fisheries and aquaculture, molecular approaches in curtailing the scourge of diseases, chemistry of natural resources for development, medicinal plants as antidotes, dynamical system analysis, modelling and optimization, artificial intelligence in the 4th industrial revolution, and demystifying 5G technology: the role of physics in tackling global health challenges. This summary therefore presents some of the observations raised at the conference.
Materials and Methods: Topical models and strategies at flattening the curve of COVID-19 pandemic in African most populous city, Lagos was presented by the Deputy Governor of Lagos State, while DG of the Nigerian Institute for Medical Research delivered the keynote address followed by the special guest speaker from Harvard Medical School and Massachusetts General hospital, USA amongst others.
Conclusion: To the best of our knowledge, FOSIC2020 was the first free and 100% virtual international conference organised by any Nigerian University to date. Overall, a total of 130 papers were presented by researchers out of the 334 registered participants representing 36 institutions from 14 countries across the world. FOSIC2020 was declared closed with a free technical workshop by the team from the University of Waterloo Canada.
To Keywords: FOSIC2020, Science, Conference, COVID-19, Lagos.

All co-authors agreed to have their names listed as authors.

1. INTRODUCTION

The Lagos State University (LASU) 7th bi-annual Faculty of Science International Conference 2020 tagged *LASU FOSIC2020* held virtually from the 2nd to 4th December, 2020. The theme of the conference was *Science and Technology in combating current and future global challenges*. LASU FOSIC2020 was the first free and 100% virtual international conference organized by any Nigerian University to date (Fig 1).
The conference reflected entirely from the opening ceremony to the technical and parallel sessions on possible solutions from different science and technology disciplines at solving global challenges covering biological/medical, chemical and physical sciences. Topical research ranging from agriculture and aquaculture, waste management, pollution remediation, and alternative energy generation, to mathematics, computer and algorithm, weather/climatic conditions and medical science, especially in the area of translational research and current strategies in managing the worldwide challenges of COVID-19 in African most populous city, Lagos State and the universe.

2. OPENING CEREMONY

The local organising committee (LOC) chairman, Professor SL. Akintola gave the welcome speech followed by the host's welcome message by the Dean of Science, Professor A. Boyo and the Chief host's opening address by LASU Vice-Chancellor, Professor AO. Fagbohun (SAN, NPOM) while the Deputy Governor of Lagos State, His Excellency Dr. KO. Hamzat, who doubled as the Chairman and Special Guest Speaker, officially declared the conference opened with a paper presentation on "COVID 19 Pandemic: the Lagos State Strategies at Flattening the Curve". Prof. BL Salako, the Director-General, Nigerian Institute for Medical Research (NIMR) delivered the Keynote address. He discussed at length on translational research and the Nigerian research policy. The astute scholar presentation was followed by paper presentations by a special guest, Dr MO. Omotayo from the Harvard Medical School and Massachusetts General Hospital, USA, took his time discussing academic scientists and the policy response to public health crises. The conference was streamed live on YouTube channel (LASU-FOSIC, 2020) and other social media.

2.1 COVID-19 Pandemic: Lagos State Strategies at Flattening the Curve by the Deputy Governor, Dr Kadiri Hamzat

Lagos State successfully used different strategies in flattening the curve of the first wave of COVID-19 since the first case was reported on the 27th February 2020, including:

1. Setting up an incident command system with the Governor as the Incident Commander and the Commissioner for health as Deputy Incident Commander.
2. A Biosecurity Laboratory (BSL)-3 facility for pathogen investigation and analyses at the Infectious Disease Hospital in Yaba, Lagos.
3. Training of medical doctors and scientists about pathogen in Germany, Japan, and France earlier, shortly after the country's Ebola outbreak challenge.
4. Partnered with the Nigeria Center for Disease Control (NCDC), Nigerian Army, United Nations Children Funds (UNICEF) and World Health Organisation (WHO).
5. Data monitoring, honest and transparent situation report to the citizens, and being proactive with information dissemination.
6. Setting-up of *War cabinet* for quick policy decision made-up of the Governor, Deputy Governor, Commissioners for Health, and Finance, Head of Service, and Attorney General of the State.
7. Set-up, an online and real-time data monitoring model, called the Lagos State COVID-19 response for data collection, analyses, and interpretation along the Emergency Operation Center (EOC) lines to support policy decision-making.
8. Investing in data automation technology through implementation of the Lagos State Emergency Response System (LASERS) to know the number of cases, admissions, number of treated and discharged patients, number of patients in the home care, separation of clinical symptoms in young and old populations.
9. Strategic policy system was initiated for: activation of isolation centres, index case preparedness, case definition update, lockdown strategy, community active case search, the inclusion of private hospitals and laboratories, gradual reopening of the economy (because about 67% of Lagosians survive on daily income), and reopening of airports.
10. Isolation centres using hotels were set-up around all the State borders-land, sea and the airport border. Ships were quarantined while the five (5) infected passengers were isolated.
11. A focused public-private partnership strategy was adopted with isolation centres built by the private sector and individuals factored into the plan with their resources properly harnessed.
12. Special hotels and dedicated isolation centres were created for the health workers especially the front workers.
13. Private laboratories were also incorporated into the testing plan with all the results submitted to the State under public health policy.
14. Testing was divided into two (2): must test (handled by the government for free of charge) and need to test (handled by the private laboratories with a payment plan).

15. Experienced private sector personnel were recruited into the strategic plans.
16. Communities were monitored under different local governments for effective control.
17. Modelling calculations were employed for forecasting and adequate planning.

Finally, the Lagos strategy was mainly data and research-driven with evidence-based adaptations to flatten the curve using strategic interventions of drugs, vaccines, training, research, logistics, physical distancing, lockdown and community engagements as town criers and through telemedicine.

2.2 Translational research as a veritable tool in combating current and future global challenges: a case study of Nigeria research policy by Prof. BL. Salako, DG, NIMR

Several points were raised with serious lessons drawn from the interesting keynote address presentation, including:

1. Translational research is the process of applying facts from basic biology and clinical trials to methods that address serious medical challenges to improve health outcomes. It transcends basic to applied and clinical research.
2. Translational medicine/science is a thoughtful effort to build on scientific research to create medical procedures, diagnostics, new therapies, or preventive measures. The goal is efficient movement of science discoveries into clinical solutions or bench to bedside.
3. The need for implementation science to aid research translation to execution. Implementation science is the study of methods for promoting integration of research findings into healthcare practice.
4. Lessons on key considerations for designing effective and good research: Relevance to national policies, ability to contribute to global research and policy needs, involvement of the community/practitioners, new contents, readability, utility/actionable, transferability, credibility, timely, accessibility, benefits, and dissemination.
5. Identification of some of the challenges facing Nigeria and other nations- Private sector participation is almost absent, pervasive corruption, policy somersault/ instability, lack of publicity of research policy/research agenda, insecurity and political uncertainty.
6. Other challenges- Research findings not used by policy makers, lack of communication between researchers and policy makers, policy makers/community not involved in determining research, need for briefs that are easy to understand by the leaders.
7. Identifying the 10 major disease burden in Nigeria (2018): Lower respiratory tract infections, neonatal disorders, malaria, HIV/AIDS, diarrhoea, tuberculosis, meningitis, ischemic heart disease, stroke, and cirrhosis.
8. Therefore, our health research fund must be increased to at least 2% of the national budget in line with the WHO/ National Council on Health (NCH) recommendation as against the current Nigerian health research fund of 0.08%.
9. The need for research advocacy involving individuals or groups with the aim of influencing decisions within the political, economic, social systems and institutions using media campaigns, public speaking, commissioning and publishing of research findings.
10. Application of one health approach. One health is the integrative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals, and the environment.
11. Integration of national and regional institutional research impact assessment for monitoring of evidence of successful practical translational research.

3. PLENARY SESSIONS

Plenary sessions were held throughout the three days of the conference including a presentation on molecular approaches in curtailing the scourge of diseases by Prof. A. Kappo (University of Johannesburg, South Africa). Prof. AO. Oyedeji from the Walter Sisulu University, South Africa, presented a paper on the chemistry of natural resources for sustainable product development with reference to medicinal plants for COVID-19 chemotherapy. Dr. PK. Nayak (University of Waterloo Canada) discussed COVID-19 and vulnerability to viability issues in small-scale fisheries social-ecological systems, while Dr. O. Onasanya (Permanent Secretary, Lagos State Ministry of Agriculture) talked extensively on research policy for attaining food security during the pandemic and post-pandemic era.

4. PARALLEL SESSIONS

A total of 130 abstract papers were presented by Scholars/Researchers with 334 registered participants from across the continents; Africa, South America, North America, Asia, and Europe, from different countries including Egypt, Ghana, South Africa, Brazil, Canada, USA, Indonesia, Japan, Malaysia, Peru, Philippines, Russia, Thailand, and Germany.

Papers presented at the international conference centered around the conference sub-themes including (a) Medicinal plants as antidotes to global health challenges, (b) Molecular approaches in curtailing the scourge of diseases (c) Shaping the chemistry of natural resources for sustainable product development in combating current and future global health challenges (d) The roles of artificial intelligence in the 4th industrial revolution (e) Post COVID-19: Effects on fisheries and aquaculture in Nigeria (f) Dynamical system analysis, modelling and optimization (g) Emerging perspectives on the epidemiology of infectious diseases (h) Demystifying the 5G

technology: the role of physics in tackling the global health challenges (i) Global ecology and challenges of combating infectious human and zoonotic diseases. Similarly, several topical issues were x-rayed and presented covering different topics on machine learning, artificial intelligence, network and epidemiological modelling, riot control, seasonal variation, Bayes model, ferromagnetism, dye solar cells, clouds attenuation effects on a satellite signal, small scale fisheries, COVID-19 and vulnerability to viability, medicinal plants/herbal medicine, molecular techniques, oncology, medical imaging, communicable and non-communicable diseases like stroke and influenza respectively amongst others.

5. CONFERENCE OBSERVATIONS/ RECOMMENDATIONS

The conference however observed and recommended the following:

1. The need for good research policies that will speedily improve development in Nigeria and other developing countries.
2. More research funding must be provided and supported by the government, private sector and the general populace, as it was done during the COVID-19 lockdown.
3. There is a need for serious training and retraining of both the civilians and military personnel for continuous disease surveillance and pandemic preparedness.
4. There must be strong collaborations between scientists in co-locality for equipment and material identification and sharing as presented with the USA Boston experience.
5. We must improve and intensify our research efforts on translational multi-disciplinary research to solve known problems and global challenges.
6. There must be strong partnership between research institutions and the private sectors on project design and research outputs.
7. Universities and research institutions like NIMR and States' parastatals must foster strong relationships in the interest of the individuals, research groups and the world.
8. There is need for Universities to partner with research institutes in co-opting researchers for free teaching and possible assessment of their papers to the professorial cadre when found awardable, e.g., Directors.
9. There is a need for Nigerian and other African Scholars to improve joint proposal writing as principal investigators in global grant applications like the National Institutes of Health (NIH).
10. Research mentors must encourage their mentees to enhance fruitful and timely robust research outputs.

6. CONCLUSION- WORKSHOP/ CLOSING EVENT

FOSIC2020 ended with a free technical workshop focusing on the V2V global partnership from vulnerability to viability (V2V, 2020) project by Dr PK. Nayak and Prof Akintola, SL, with postgraduate students across different countries, participating as panel members. Free electronics book of abstracts and certificates of participation were uploaded on all participants' dashboard for easy download.

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COMPETING INTERESTS

All authors have declared that no competing interests exist.

AUTHORS' CONTRIBUTIONS

AAA designed the study and wrote the first draft of the manuscript. AAA, HAB, OOO, OAO, RBA, TSE, OLO, RAM, KOA, FAA and SLA edited the first draft. All authors read and approved the final manuscript.

REFERENCES

1. LASU Faculty of Science (FOSIC). Live streaming on YouTube channel. 2020. Accessed 5 December 2020. Available: https://www.youtube.com/watch?v=QS2st4gv4PQ.

2. V2V. Global Partnership from Vulnerability to Viability project. 2020. Accessed 6 December 2020. Available: https://www.v2vglobalpartnership.org/.

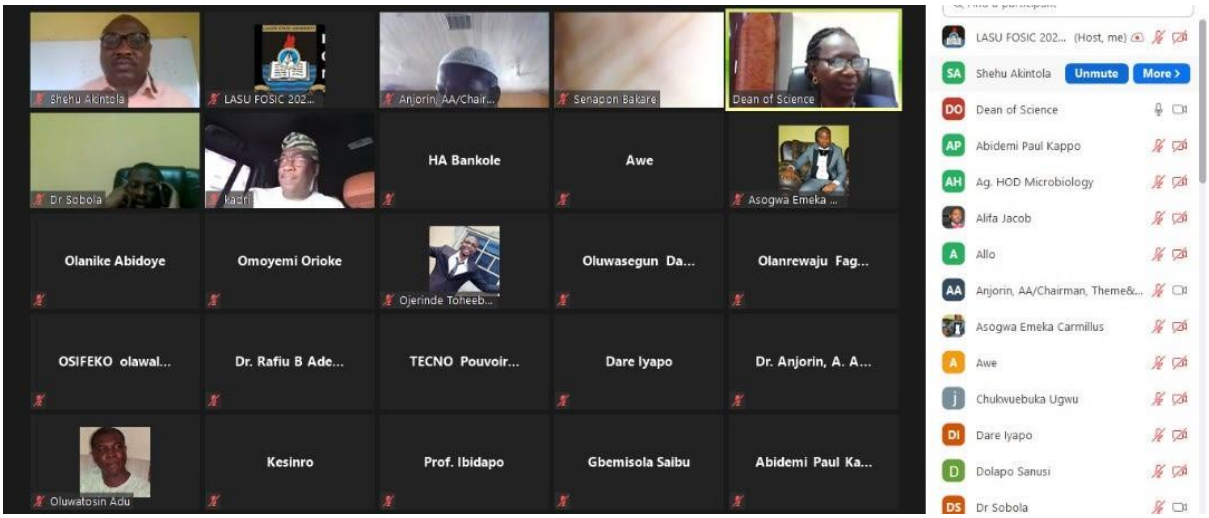

Fig. 1 LASU FOSIC2020: A virtual picture showing the Lagos State Deputy Governor, LASU VC, Dean of Science, LOC Chairman, LOC members and other participants.