Perseverance Dzikunu, Ph.D

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+233542472778

Kumasi, Ghana

Google Scholar

Personal details and the date of the CV

- Dzikunu
- Perseverance
- ResearcherID: 0000-0001-8248-451X
- 04/05/2025

Previous Work Experience

05/2025 – Present
Kumasi, Ghana

Lecturer
Department of Materials and Metallurgical Engineering, KNUST
Postgraduate Courses Taught
- MSE 560-Phase Equilibria

Undergraduate Courses Taught
- MSE 364 Materials Characterization Lab (Kumasi & Obuasi Campus)
- METE 356 Metallurgical Characterization Lab (Kumasi & Obuasi Campus)

01/2025 – 10/2025
Kumasi, Ghana, Ghana

Postdoctoral Researcher
DIPPERLAB, KNUST
1. Designed and developed three-electrode sensor using anodic stripping voltammetry for heavy metal detection.
2. Calibrated sensor for measuring heavy metals such as lead (Pb), mercury (Hg), and cadmium (Cd) from polluted water.

08/2019 – 05/2025
Kumasi, Ghana

Lab Maintenance Engineer (Voluntary Service)
Kwame Nkrumah University of Science and Technology
1. Developed and installed heat-treatment Furnace at the lab
2. Responsible for repairing and maintaining lab equipment.
3. Trained undergraduate and postgraduate students on the use of lab equipment.

04/2023 – 02/2025
Fumesua-Kumasi, Ghana

Laboratory Maintenance Engineer (Part Time)
Council of Scientific & Industrial Research (CSIR)
Successfully carried out the following roles:
1. Furnaces, Water-bath, and Oven Repairs
2. Refurbishment of old Humidity Chamber for Soil Test
3. PID Temperature-Controller installations and Repair

01/2024 – 12/2024
Sunyani, Ghana

Assistant Lecturer (Part Time)
Department of Materials Engineering, Sunyani Technical University (STU)
Taught and examined students on the following courses:
1. Polymer Science
2. Mechanical Behaviour of Materials
3. Welding Metallurgy

01/2024 – 09/2024
Kumasi, Ghana

Graduate Assistant (PhD)
Kwame Nkrumah University of Science and Technology
Taught Materials Engineering Lab (Year 3)
Course Modules
1. Ultrasound flaw detection theory (classroom) and practicals (lab)
2. Electrodeposition (classroom) and practicals (lab)
3. Dye penetrant testing (classroom) and practicals (lab)
4. Corrosion studies (classroom) and practicals (lab)

5. Metallography (classroom) and practicals (lab)

09/2022 – 12/2022
Accra, Ghana

Trainee Engineer (Internship)
Well Built Construction (WBC) Company
Learned Construction Materials and Practices

09/2021 – 11/2021
Aflao, Ghana

Trainee Engineer (Internship)
Diamond Cement Company Limited
Trained in the Cement Production Department on Cement Plant Controls and Quality Control Assurance

08/2019 – 08/2021
Kumasi, Ghana

Graduate Assistant (MPhil)
Kwame Nkrumah University of Science and Technology
I carried out the following roles successfully:
1. Worked as a lab technician.
2. Assisted students at the lab with their research work.
3. Tutor students on how to use equipment at the lab.
4. Assisted my supervisor in teaching Research Methods at the School of Distant Learning (IDL)

05/2018 – 08/2019
Kumasi, Ghana

Teaching/ Research Assistant (National Service)
Kwame Nkrumah University of Science and Technology
1. Organize tutorials for materials engineering undergraduate students.
2. Help in preparing lecture materials.
3. Marking and recording of quizzes and assignments
4. Help in research works carried out in the department.
5. Assisted in administrative work.

Degrees

11/2021 – 03/2025
Kumasi, Ghana

PhD Materials Engineering
Kwame Nkrumah University of Science and Technology
Thesis: Optimization of spent pot lining treatment for graphene oxide synthesis for supercapacitor application

11/2023
Espoo, Finland

PhD Exchange
Aalto University
Contingent Doctoral Student in Mechanical Engineering Department, Materials to Product Research Group
Research Conducted: Effect of heat treatment on microstructural and nanomechanical properties of nickel plate current collector (EBSD and nano-indentation studies)

08/2019 – 06/2021
Kumasi, Ghana

Master of Philosophy in Materials Engineering
Kwame Nkrumah University of Science and Technology
Thesis: Utilization of treated spent pot lining doped with zinc oxide for supercapacitor application

08/2014 – 06/2018
Kumasi, Ghana

Bachelor of Science in Materials Engineering
Kwame Nkrumah University of Science and Technology
Thesis: Characterization of waste foundry sand from selected foundries in Ghana.

Skills

Conversant with the use of SEM machine, Surface Profilometer, Nano indenter

Able to undertake research and present results in a comprehensive format

Skilled in the use of MS Word, Excel, and PowerPoint

Proficiency in GRANTA Material Inspiration Software for Materials Selection

Design Expert Software for Statistical Modeling

Fluoride Analysis

Artificial Neural Network for Modeling ● ○ ○ ○ ○

Has a ready-to-learn attitude and follows instructions

Possesses good communication and interpersonal skills

CAD Software for Modeling (Google Sketchup/Solid Works) ● ● ● ● ○

Z-View EIS software electrochemical analysis

Electrochemical spectroscopy (Cyclic Voltammetry, Galvanostatic Charge/Discharge, Electrochemical Impedance Spectroscopy, Potentiodynamic Polarization, etc.)

Python for data analysis and modeling

Key Technical Skills

- Membrane Materials & Polymers: PVDF, PAN, and polymer–oxide composites; dope preparation; phase inversion and casting; porosity and permeability control.
- Materials Processing & Optimization: Solution processing, hydrothermal synthesis, dispersion control, and process standardization.
- Characterization Techniques: SEM, XRD, FTIR, BET, Nanoindentation, Contact Angle, TGA, DSC, EIS, CV, and mechanical testing.
- Process Control & Scale-up: Pilot-scale experiment design, data acquisition, and performance troubleshooting.
- Analytical & Reporting: Data analysis, experiment documentation, technical report

Research funding and grants

11/2023 **Doctoral Research Visit Grant**
Aalto University
Euros 15,000 grant from Aalto University for PhD exchange and Research

16/11/2021 **African Centre of Excellence Scholarship**
Kwame Nkrumah University of Science and Technology Engineering Education Project (KEEP)
Doctoral scholarship grant covering research, stipend, and accommodation

28/10/2021 **Kwame Nkrumah University of Science and Technology Research Fund (KREF)**
Kwame Nkrumah University of Science and Technology
GHc 45,000 research grant won for the project on the investigation of the suitability and utilization of spent pot lining as battery/supercapacitor electrode

06/02/2019 **African Centre of Excellence Scholarship**
Kwame Nkrumah University of Science and Technology Engineering Education Project (KEEP)
Master of Philosophy Scholarship covering research, stipend and accommodation.

07/08/2014 **Undergraduate Scholarship**
Overseas Union Ghana Limited
Undergraduate scholarship covering stipend and accommodation.

Certificates

Certificate in Digital Literacy
Kuyu Project

BSc. Materials Engineering
Second Class Upper Division

MPhil Materials Engineering
First Class Division

PhD Materials Engineering
First Class Division

Research output

1. Appiah, E. S., **Dzikunu, P**., Mahadeen, N., Ampong, D. N., Mensah-Darkwa, K., Kumar, A., ... & Adom-Asamoah, M. (2022). Biopolymers-Derived Materials for Supercapacitors: Recent Trends, Challenges, and Future Prospects. Molecules, 27(19), 6556

2. Dzikunu, P., Arthur, E. K., Gikunoo, E., Mensah-Darkwa, K., Akinwamide, S.O. and Vilaça, P., 2024. Optimization of process parameters and kinetics of fluoride extraction from spent potlining using response surface methodology. Journal of Environmental Management, 367, p.121896.

3. Dzikunu P, Kwesi E, Gikunoo E, Mensah-darkwa K, Olukayode S, Fangnon EAK, et al. Electrochemical performance of graphene oxide synthesized from graphitic spent potlining for energy storage application. Journal of Energy Storage. 2024;101(PB):113896. Available from: https://doi.org/10.1016/j.est.2024.113896

4. Dzikunu, P., Arthur, E. K., Gikunoo, E., Bleppony, E., Agyemang, F. O., & Mensah Darkwa, K. (2023). Successive selective leaching procedures for valorization of spent pot lining carbon. Process Safety and Environmental Protection, 169, 1-12

5. Dzikunu, P., Appiah, E.S., Arthur, E.K. et al. Waste-to-carbon-based supercapacitors for renewable energy storage: progress and future perspectives. Mater Renew Sustain Energy 14, 8 (2025). https://doi.org/10.1007/s40243-024-00285-4

6. Mensah-Darkwa, K., Ampong, D. N., **Dzikunu, P**., de Souza, F. M., Kumar, A., & Gupta, R. K. (2023). Multi-metallic organic framework-derived materials for electrocatalytic CO2 reduction reaction. Fuel, 335, 127056

7. P. Dzikunu, Emmanuel Kwesi Arthur, Emmanuel Gikunoo, Elike Bleppony, Daniel Nframah Ampong, Frank Ofori Agyemang, Ruth Ebela Kwofie, Kwadwo Mensah-Darkwa,Energy storage capabilities of spent pot lining and ZnO composite for supercapacitor applications,Next Materials,https://doi.org/10.1016/j.nxmate.2025.10072

8. Kusi, D.A., Arthur, E. K., Gikunoo, E., **Dzikunu, P**., Asiedu, K. K., Armoo, R. and Agyemang, F.O., 2024. Electrochemical Performance of Chemically Treated Pyrolytic Carbon Black from Waste Car Tyres. Energy Nexus, p.100297

9. E. Bleppony, E. K. Arthur, E. Gikunoo, **P. Dzikunu,** F. O. Agyemang, and K. Mensah Darkwa, "Four-stage chemical treatment of spent pot lining carbon for titanium oxide doped high-performance supercapacitor electrode material," Next Mater., vol. 1, no. 3, p. 100022, 2023, doi: 10.1016/j.nxmate.2023.100022.

10. ES Appiah, **P Dzikunu**, SO Akinwamide, EAK Fangnon, K Mensah-Darkwa, A Andrews, FO Agyemang, MA Nartey, K Makgopa, S Bossuyt. (2024). A review on progress and prospects of diatomaceous earth as a bio-template material for electrochemical energy storage: synthesis, characterization, and applications. Ionics, https://doi.org/10.1007/s11581-024-05825-6

11. DN Ampong**, P Dzikunu**, FO Agyemang, P Aggrey, MA Nartey, AK Pal, E Gikunoo, A Andrews, K Mensah-Darkwa, RK Gupta. (2024). Facile Synthesis of Colocasia esculenta Peels-Derived Activated Carbon for High-Performance Supercapacitor. Energy Storage 6 (7), e70057

12. Ocloo, D., Agyemang, F. O., **Dzikunu, P.,** Koomson, B., Ohemeng-Boahen, G., Akoto, E. H., & Martey, A. K. (2025). Waste PET bottle-derived carbon for defluorination of fluoride-polluted water. Environmental Technology, 1–24. https://doi.org/10.1080/09593330.2024.2447960

13. Akortia, V.K., Kankam, C.K., Biney, E., **Dzikunu, P**., Afrifa, R.O. and Banahene, J.O., Assessment of Oil Paints for Corrosion Protection of Reinforcing Steel Bars in Concrete. Journal of Scientific Research and Reports https://doi.org/10.9734/jsrr/2024/v30i112598

14. Arthur, E.K., Gikunoo, E., Akromah, S., Azeko, S.T. and **Dzikunu, P**., 2020. Alternative materials for grey cast iron corn-mill plates by computer-aided selection and weighted property methods: The case of Ghana. *SN Applied Sciences*, *2*, pp.1-9.
15.

Research supervision experience

Fabrication of composite electrode from cassava peel derived activated carbon and MnO2 for supercapacitor application
Undergraduate Project Supervised-KNUST

PVDF/ZnO/Graphite flexible piezoelectric pulse sensor: potential material for measuring heart pulse
Undergraduate Project Supervised-KNUST

Synthesis of pineapple peels derived activated carbon for supercapacitor electrodes
Undergraduate Project Supervised-KNUST

Design and fabrication of heat treatment furnace
Undergraduate Project Supervised-STU

Fabrication and Characterization of Composite Materials for Wind Turbine Blade
MPhil Project Executed on contract-KNUST

Multiphase conductive polymer composite using pyrolytic carbon black as fillers
Undergraduate Project Supervised-KNUST

Utilization of plantain fiber as reinforcement for epoxy polymer composite
PhD Advanced Composite Coursework

The study of geopolymer concrete (cementless concrete)
Undergraduate Project Supervised- Akenten Appiah - Menka University of Skills Training and Entrepreneurial Development

Corrosion studies on 3D printed aluminum alloy
Collaborative work with a former supervisor at Aalto University

Corrosion behavior of 3D printed Titanium alloy
Collaboration with former supervisor at Aalto university

Interests

- Supercapacitor/ Battery cell Design
- Biomaterials and composite materials
- Membrane and filter synthesis for waste water treatment
- Synthesis and characterization of electrochemical energy storage materials
- Mechanical testing (microhardness, tensile testing) and materials characterization techniques (optical microscopy, UV spectrophotometer)
- Microstructural and mechanical behavior of materials
- Waste valorization and heavy metal adsorption

Academic Conferences

08/2023
Kumasi, Ghana
KNUST workshop on Managing Change Through Creativity, Innovation, and Entrepreneurship

06/2023
Materials Engineering Department-KNUST Seminar
Towards Development of New High-Temperature Shape Memory Polymers for Engineering Application

04/2023 Kumasi, Ghana	**KNUST workshop on Microstructural and Nanomechanical Characterization of Advanced Engineering Materials: EBSD and Nanoindentation**
07/2022	**4th Symposium of West African Sustainable Engineering Network for Development (WASEND)** Presented on utilization of spent pot lining doped with zinc oxide for supercapacitor application
2021	**7th Edition of Africa Engineering Week and 5th Africa Engineering Conference (Ghana Institute of Engineers (GhIE)** Presented on Sustainable Recycling of Spent Pot Lining from Valco for Utilization in Electrochemical Energy Storage Devices.

References

Kwadwo Mensah-Darkwa, PhD, *Professor, Department of Materials Engineering,*
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Emmanuel Kwesi Arthur, PhD, *Senior Lecturer, Materials Engineering Department,*
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