

Impact of Experiment-Centric Pedagogy demonstrated through technical writings, conferences, and publications.

The use of experiment-centric pedagogy in STEM education has shown to have a positive impact on students' ability to think critically, to be motivated, and to feel competent. Numerous published publications displaying improved student outcomes are the result of a multi-year examination into the benefits of inquiry-based, hands-on learning strategies at the undergraduate level. 21 publications from conferences, and symposiums communicated the research results and program impacts. These studies demonstrate how students in engineering, physics, mathematics, chemistry, biology, and other technical fields learn more effectively and with greater confidence when they are exposed to practical, hands-on lessons. The following articles go into more detail about how experiment-based curricula affect students' capacity for problem-solving, interest in STEM fields, and self-confidence. The study's main finding is that active, lab-based teaching strategies are important for fostering critical thinking abilities, intrinsic drive, and self-efficacy in the next generation of STEM workers.

The research findings and program outcomes have been disseminated through 21 articles [1-21].

Papers can be obtained from the link below:

https://drive.google.com/drive/u/0/folders/1LhgDDH-OI8yVLqff5I_4B0mmBnMS_Tus

Articles for the Work

1. **Owolabi, O.**, Abedoh, H., Abiodun, P., Ahangari, S., Efe, S., Hunter, J. Chavis, C., Ikiriko, S., Nwachukwu, N., Oguntimein, G., Shokouhian, M.,” James-Okeke, P., Shourabi, N., Duru, C., Bello, M., Freeman, M., , Ladeji-Osias., J., Bista, K., Bhandari, A, Gaulee, U.

Dugda, and Wemida, A. (2023). Hands on Learning Pedagogy in Teaching Concepts relevant in the Analysis, Design and Maintenance of Transportation Infrastructure Systems”. *TRBAM-S-22-05893 Presented Transportation Research Board 2023 Conference and Accepted for TRR Journal.*

2. **Owolabi, O. A.**, Abiodun, P., Asahiah, A., Abedoh, H., Aladeokin, O., Shokouhian, M. Bazyar Shourabi, N. Bista, K., Gaulee, U., Rahman, M. Ladeji-Osias, J, (2023). Utilization of Social Management Theoretical Framework and Program Management Tool to Successfully Manage Large Multi-Department STEM Projects. *2023 ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed. .
3. **Owolabi, O.**, Duru, C., Abiodun, P., Efe, F., Bazyar Shourabi, N., Dugda, M., Bista, J., Gaulee, U., Rahman, M., Adeniran, O., Ikiriko, S. K., Ladeji-Osias, (2023). Utilization of Inexpensive, Safe, and Portable Electronic Instrumentation Systems to Increase Students’ Performance in Multiple Stem Disciplines. *2023 ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed. Best Paper Award.
4. Adeika, B., ., Ariyibi, A., Olude, A., Abiodun, P., Abedoh, H., Oni, A., Bazyar Shourabi, N., Ladeji-Osias, J., Bista, K., Efe, F. **Owolabi, O.**, (2023) Increasing Student Motivation and Learning by Adopting the Experiment-Centric Pedagogy: A Case of Undergraduates in Biology. . *2023 ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
5. Olude, A., **Owolabi, O.**, Abiodun, P., Abedoh, H., James-Okeke, P., Yang, D., Sadeghvaziri, E., Chavis, C. Nwachukwu, N., Bazyar Shourabi, N., Bello, M., Dugda, M., Bista, K., Bhandari, A., Efe F., and Ladeji-Osias, J. (2023). Utilization of Real-life Hands-on Pedagogy to Motivate Undergraduate Students in Grasping Transportation Related Concepts. *2023 ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.

6. Akinpelu, O., Alamu, O., Lee, S., Pelumi, A., **Owolabi, O.** and Ladeji-Osias, J. (2023). Experiment and Performance Based an Innovative Approach to Teaching Industrial Engineering Courses in a Hybrid Learning Environment. Accepted for 2023 *ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
7. Abiodun, P., **Owolabi, O.**, Efe, S., Bazyar, N., Oguntimein, G., Efe, F., Bista, K., Ladeji-Osias, J., Gaulee, U., Rahman, M., Olude A., (2023). Evaluating the Impact of Experiment-Centric Pedagogy on Civil Engineering Undergraduates' Motivation. 2023 *ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
8. Ibirinde, T., Olude, A., Abiodun, P., **Owolabi, O.**, Koissi, N, Peng, J., Bista, K., Bazyar Shourabi, N., Efe, F. Ladeji-Osias, J. (2023). Work in Progress: Using Experiment-centric Learning Pedagogy in Increasing Student Understanding of Chemical Principles and Concepts in Chemistry Department. 2023 *ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
9. Adeniran, O., **Owolabi, O.**, Abiodun, P, Rahman, M., Sakk, E., Efe, F., Ladeji-Osias, J. (2023). Preliminary Experience and Impact of Experiment-focused Teaching Approach in a Computer Architecture Course in Computer Science. Accepted for 2023 *ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
10. Adeyemi, T., **Owolabi, O.**, Efe, F., O., Abiodun, P., Bazyar Shourabi, N., Duru, C., Gaulee, U., and Ladeji-Osias, J. Experimental Centric Pedagogy as Scaffolding for a Better Understanding of Calculus in Mathematics Discipline. 2023 *ASEE Annual Conference & Exposition*, July 2023. Peer Reviewed. Conference Paper.
11. Efe., F., Kinyua, A., Negusse, E., Shourabi, N., Abiodun, P. Abedoh, H., **Owolabi, O.** (2023). Comparison of the effectiveness of in-person and remote labs for undergraduate Physics students at an HBCU. Accepted for 2023 *ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.

12. Kinyua, A., ., Negusse, E., **Owolabi, O.** Ariyibi, A. Ladeji-Osias. (2023). Strategic Outreach for Nuclear Workforce Pipeline Development and Maintenance at a Historically Black College University (HBCU). *2023 ASEE Annual Conference & Exposition*, June 2023. Peer Reviewed.
13. Abiodun, P. Olude, A., **Owolabi, O.**, James-Okeke, P., (2023). The impact of teaching noise detection and control strategies among historically black college and university student using hands-on pedagogy on student’s motivation and curiosity. *Noise-Con 2023 Conference*. May 2023.
14. Abiodun, P. Olude, A., **Owolabi, O.**, James-Okeke, P., (2023). Students' feedback on the use of low-cost, portable and safe hands-on tools in teaching and demonstrating noise pollution at a historically black university. *Noise-Con 2023 Conference*. May 2023.
15. **Owolabi, O.**, Chavis, C., Nwachukwu, N., James-Okeke, P., Ahangari, S., Shourabi, N., Freeman, M., Bello, M., Bista, K., Gaulee, U., Dugda, M., Bhandari, A., Ladeji-Osias., J., Ntonifor, I., and Shokouhian, M., (2022). “Development and Implementation of Experiment Centric Active Learning Experiments/Activities in Transportation During the Pandemic and Beyond”. *TRBAM-22-04426 Transportation Research Board 2022 conference*.
16. **Owolabi, O. A.**, Ladeji-Osias, J., Bista, K., Alamu, O. S., Connor, K., Brown, J., Ferri, A. Gullie, K., Spaulding, D. (2021). “Global Impact of Experiment Centric Pedagogy and Home-Based Hands-on Learning Workshop at a Historically Black University”. *2021 ASEE Annual Conference & Exposition*, July 2021. <https://peer.asee.org/global-impact-of-experiment-centric-pedagogy-and-home-based-hands-on-learning-workshop-at-a-historically-black-university>

17. **Owolabi, O. A.**, Alamu, O. S., Ladeji-Osias, J., Partlow, L., Shokouhian, M., Bista, K., Johnson, R., Gullie, K., Spaulding, D. (2021). "Virtual Intensive Training for Experimental Centric Pedagogy Team Members: Challenges, Opportunities and Effectiveness During COVID-19 Pandemic". *2021 ASEE Annual Conference & Exposition*, July 2021. <https://peer.asee.org/virtual-intensive-training-for-experimental-centric-pedagogy-team-members-effectiveness-during-covid-19-pandemic>
18. **Owolabi, O. A.**, Bista, K., Ladeji-Osias, J, Shokouhian, M., A. Alamu, O. S., Lee, S., Oguntimein, G., Ariyibi, A., and Lee, H. (2021). "Best Practices for the Implementation of Home-Based Hands-On Lab Activities to Effectively Engage STEM Students During a Pandemic". *2021 ASEE Annual Conference & Exposition*, July 2021. <https://peer.asee.org/best-practices-for-the-implementation-of-home-based-hands-on-lab-activities-to-effectively-engage-stem-students-during-a-pandemic>
19. Sotonye, I. A., Wemida, A, Efe, S., Shokouhian, M., A., **Owolabi, O. A.** and , Ladeji-Osias, J (2021). "Home-based Cantilever Beam Experiment for Civil Engineering Undergraduate Students". *2021 ASEE Annual Conference & Exposition* July 2021. <https://peer.asee.org/home-based-cantilever-beam-experiment-for-civil-engineering-undergraduate-students>
20. Bello, M. O., Nwachukwu, N.J., Ntonifor, I.M., Koissi, N., **Owolabi, O.A.**, and Ladeji-Osias, J. (2020). "Chemistry and Transportation Engineering Experiment-Centric Pedagogy with Hands-on-Labs". *ASEE Middle Atlantic Section Fall 2020 Conference*, Nov. 2020, *Stevens Institute of Technology, Hoboken NJ, USA*. <https://peer.asee.org/chemistry-and-transportation-engineering-experiment-centric-pedagogy-with-hands-on-labs>
21. Ladeji-Osias, J., **Owolabi, O. A.**, Bista, K., Gaulee, U., Wemida, A. B., Efe, S., Oni, A. Ariyibi, A., Ndirangu, C. G., Olanrewaju, E. O., Lee, S., Alamu, O. S., Shokouhian, M., Ikiriko, S., Kinyua, A., (2020). "Initial impact of an experiment-centric teaching approach in several STEM disciplines", *2020 ASEE Annual Conference & Exposition*, virtual. June

2020. <https://peer.asee.org/initial-impact-of-an-experiment-centric-teaching-approach-in-several-stem-disciplines>

<https://tinyurl.com/ImpactofECP>

Access
Publications

