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## ALIGNING SCIENCE EDUCATION WITH INDUSTRIAL NEEDS FOR SUSTAINABLE DEVELOPMENT: IMPLICATIONS FOR TEACHER EDUCATION

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### Abstract

In today's rapidly changing world, the alignment of science education with industrial needs has become increasingly important for promoting sustainable development. This paper examines the need to integrate industrial needs into the teaching and learning of science education in Nigeria. Science education plays a crucial role in preparing students for careers in industries and addressing sustainability challenges. The paper highlights the significance of curriculum development, pedagogical approaches, professional development, industry partnerships, technology integration, and research in teacher education. It emphasizes the need to update curricula to reflect industry demands, incorporate innovative pedagogical approaches, and provide continuous professional development opportunities for teachers. Collaborations with industries, research organizations, and professional associations are essential for bridging the gap between education and industry. In addition, technology integration and research initiatives contribute to effective science teaching and learning aligned with industry requirements. The implications presented in this paper provide a framework for enhancing teacher education in Nigeria and ensuring that science education prepares students for sustainable development and meaningful industry participation.

**Keywords:** Science Education, Sustainable Development, Industrial Needs, Teacher Education.

### Introduction

Science education is the acquisition of knowledge capable of making the citizens of a society functional, resulting in the technological development and advancement of such a society. It is the instructional process that enhances individuals' knowledge about the environment, fosters systematic inquiry skills, and cultivates natural attitudes. It is universally acknowledged that science education is a prerequisite for technological development. It involves an in-depth study of scientific subjects while also imparting validated educational knowledge and concepts. The scientific advancements of a country are vital for its global recognition. According to Omole & Ozoji (2014), science education identifies natural phenomena that align with the interests and capabilities of children. It

equips teachers, learners, and society with the necessary knowledge, skills, resources, and freedom to engage in tasks that contribute to socioeconomic improvement. Eilks (2015) further emphasizes that science education programs aim to produce competent scientists who make meaningful contributions to academic excellence and raise the economic standards of nations. Science education refers to the teaching and learning of scientific concepts, principles, and practices in educational settings. It encompasses various disciplines such as physics, chemistry, biology, environmental science, and technology. Science education plays a vital role in equipping students with the knowledge, skills, and scientific literacy necessary to understand the natural world, engage in critical thinking, and contribute to societal development. In Nigeria, science education's primary objective is to encourage scientific literacy and equip students with the knowledge, skills, and attitudes needed to understand and engage with the natural world. Nhamo & Mjimba (2020) enumerate some of the specific objectives of science education in Nigeria as follows:

- Science education aims to equip students with a solid foundation of scientific knowledge across various disciplines such as physics, chemistry, biology, and environmental science. It focuses on helping students understand fundamental scientific concepts, principles, and theories.
- It seeks to develop students' ability to think critically, ask questions, and engage in scientific inquiry. It encourages students to explore, investigate, and experiment, fostering a spirit of curiosity and exploration.
- Science education aims to develop students' problem-solving skills by applying scientific principles to real-world situations. It cultivates the ability to analyze problems, formulate hypotheses, design experiments, collect data, and draw evidence-based conclusions.
- Science education introduces students to the scientific method and scientific processes. It emphasizes the importance of systematic observation, data collection, analysis, and interpretation. Students learn to evaluate evidence, make predictions, and draw logical conclusions based on empirical evidence.
- It promotes effective communication skills, both oral and written, to enable students to articulate scientific concepts, explain experimental procedures, present findings, and engage in scientific discussions.
- It emphasizes the importance of environmental awareness and sustainability. It aims to develop students' understanding of environmental issues, their causes, and potential solutions. This includes promoting ecological literacy, biodiversity conservation, and sustainable practices.
- Science education aims to enhance students' technological literacy by integrating technology into scientific learning. It prepares students to use various scientific tools, instruments, and technologies effectively and responsibly.
- According to the National policy on education, Science education in Nigeria aims to prepare students for careers in science, technology, engineering, and mathematics (STEM) fields. It provides a sound foundation for further education and research and practical skills required for diverse scientific careers (FGN, 2014).