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## Qualitative Study on Teachers' Anxiety and Burnout: A Panacea for Qualitative STEM Education Objectives in Nigeria

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### **Abstract**

*Nigeria is one of the developing nations with milestone developments in science and technology over decades. From independence in 1960, there have been massive investments in education by the Federal Government as to meet up the set national educational goals to derive for the national developments. All areas of learning or disciplines were accorded utmost priorities with appropriate curricula, in particular, science and technology were the most concern of the Federal Government of Nigeria. Science, Technology, Engineering and Mathematics (STEM) education is the focus of several countries of the world of today. Significantly, the 21<sup>st</sup> century skills are highly required to drive the STEM education towards the scientific and technological advancements commensurate to the dynamic contemporary world. The paper reviewed the extent to which teachers' characteristics, specifically, anxiety and burnout serve as shields to the attainment of the STEM education objectives in Nigeria. It buttressed further the implications of the two constructs in relation to the teaching of STEM across the learning institutions and projected how, if not controlled, could go a long way in undermining and crippling the attainment of the stated STEM objectives. The authors finally recommended among others that the stakeholders in STEM education should moderate the teaching workload among science teachers in high schools and provide more incentives to them as to ensure effective teaching and learning of STEM, which invariably could lead to the smooth transition towards the attainment of STEM education objectives in Nigeria, and the world in general.*

**Keywords:** STEM, teachers' anxiety, burnout, STEM objectives.

### **Introduction**

For the past few decades, scientific and technical advancements have been visible from ancient to modern societies. This is unquestionably due to significant national investments in education that make use of both human and environmental resources. As a result, nations assumed the position of industrialized nations such as America, China, France, Japan, and others; to developing nations such as Nigeria, Ghana, and their allies. Education—more especially, disciplines with a focus on science and technology—is the driving factor behind this progress. In recent years, Science, Technology, Engineering, and Mathematics (STEM) education has become increasingly prevalent in modern countries because it equips students with the fundamental abilities necessary to meet the problems of the contemporary world. People with expertise in STEM fields are now essential in societies that are becoming more and more reliant on technology. The goal of STEM education is to enrich students with the knowledge and skills required to be functional and relevant in industrialization of nations. STEM education is essential in preparing the next generation of workers by encouraging critical thinking, creativity, and problem-solving. It incorporates ideas from science, technology, engineering, and mathematics into a multidisciplinary approach to education (Vega and O'Donnell, 2025). STEM places a strong emphasis on real-world problem-solving,



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practical applications, and practical experiences. Students are encouraged to think critically and creatively in STEM programs, which frequently entail group projects.

### **Objectives of Stem Education in Nigeria**

Nigeria as a nation has dived into the pool of STEM education to enhance science and technology advancements to attain its national development. The objectives of STEM education in Nigeria include:

1. **Development of a skilled workforce for the future:** One of the key objectives of STEM education in Nigeria is to develop a skilled workforce that is equipped with the necessary knowledge and skills that fit the technology-driven world. This aims to prepare learners for careers in STEM-related disciplines, which are in high demand globally. Nigeria can address the skills gap and ensure that its workforce remains competitive in the global economy (Federal Ministry of Education, Nigeria (FRN, 2014).
2. **Promotion of innovation and entrepreneurship:** -STEM education in Nigeria also aims to foster a culture of innovation and entrepreneurship. By providing students with a strong foundation in science, technology, engineering, and mathematics, they are encouraged to think creatively, solve problems, and develop innovative solutions. This objective seeks to empower students to become future innovators, inventors, and entrepreneurs who can contribute to the socio-economic development of Nigeria (National Universities Commission (NUC), 2017)
3. **Bridge the gender gap in STEM fields:** - Another objective of STEM education in Nigeria is to bridge the gender gap in STEM fields. Historically, there has been a significant underrepresentation of women in science, technology, engineering, and mathematics. By encouraging girls and women to pursue STEM education and careers, Nigeria can ensure equal opportunities for all and tap into the untapped potential of women in STEM fields (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2017)
4. **Enhancing Problem-Solving and Critical Thinking Skills:** - STEM education in Nigeria aims to enhance students' problem-solving and critical thinking skills. By engaging students in hands-on activities, experiments, and real-life applications of STEM concepts, they develop the ability to think critically, analyze information, and solve complex problems. These skills are essential for success in various fields and contribute to the overall cognitive development of students (Oludipe, 2015)
5. **Foster National Development and Technological Advancement.** - The fifth objective of STEM education in Nigeria aims to foster national development and technological advancements experienced in developed nations of the world. By equipping students with STEM knowledge and skills, Nigeria can definitely attain innovation, sustainable development, and technological advancements. This is in line with Nigeria's vision to become a globally competitive nation and leverage science and technology for economic growth and social progress. (National Information Technology Development Agency (NITDA), 2016)

### **How Teachers' Anxiety Affects STEM Education**

Anxiety is a construct that has been extensively studied by researchers for a long period of time, especially in psychology and educational researches which simply refers to the feeling of uncertainty, fear, nervous in doing or about something. Teachers' anxiety is reconceptualized as future-oriented emotional syndrome caused by cognitive appraisals of threat to effective achievement of classroom goals, resulting to low self-efficacy and behavioural abnormalities (Gupta and Lee, 2025). Anxiety in teachers is a considerable affective state that may have some adverse effects on the learning and teaching processes. Similarly, it creates an unpleasant work environment and career situations; thus, teaching may be an activity that is avoided. Novice teachers, for example, find themselves in situations of bewilderment where they become unsure of how to deal with them. In addition, teachers often start their teaching career with high self-esteem and expect high outcomes. However, along the line, they tend to realize the mismatch between their ideals and the real teaching environment. At that point, most teachers feel confused and become stressed out, yet they rarely get the necessary help. This is because teaching was always thought to be a low-stressing job. According to some academic and governmental research, it indicates that teaching is among the most emotionally challenging jobs (Jones-Rincon and Howard, 2019; Stewart, 2018). It is possible that a many teacher in Nigeria experience symptoms of anxiety. This is because, poor working conditions in schools necessitate a high level of physical, intellectual, and emotional health for the teachers. However, there are a variety of emotional and psychological challenges that could have differential effects among teachers, negatively impacting their ability to teach effectively (Asaloei *et al.*, 2020). Science teachers have recently experienced professional anxiety as a result of transitioning through an era of rapid worldwide change, particularly large changes in curriculum



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design and dynamic multitasking responsibilities, culminating in the formation of high-performance expectations in schools. Teacher-student conflict, teacher-family conflict, student discipline issues, insufficient assistance, lack of promotion and under-representation in decision-making are all among factors contributing to anxiety among teachers (Demir, 2018). Teachers suffer from tension, worry, job discontent, a desire to leave, as well as cognitive and emotional pain as a result of these issues (Demir, 2018). Consequently, the teachers who are not well supported and unable to socialize during their induction phase often face problems not limited to teacher's low efficacy, inconfidence, teaching reluctance, reality shock and job stress. Empirically, Carey *et al.* (2019) maintained that teachers' anxiety is a cause of a deficit in science teachers' ability and poor science students' academic achievement. The debilitating anxiety model also suggests that anxiety hinders teaching, learning, and performance as it causes stress and makes thinking difficult. It is pertinent to note that teaching anxiety is a significant affective state that may have profound effects on both the learning and teaching processes. However, if teaching anxiety in teachers is left unattended to on time, the adverse effect could extend to undermining the adequate teaching of entrepreneurship skills which is one of the objectives of STEM education across the globe. The pattern through which teaching anxiety affects the various aspects of learning, teaching processes and outcomes need to be contextualized with the objectives of STEM. This is because, students taught by anxious teachers could be deficient of basic foundation in STEM, stemming to having a deficiency in creativity and problem-solving approaches capable of contributing to the socio-economic development of Nigeria (N. U. C., 2017)

### **How Teachers' Burnout Affects the Achievement of STEM Education Objectives**

Another significant variable of this write-up is the teacher's burnout. Teacher burnout has often been linked to years of overwork, which causes veteran teachers to feel exhausted and emotionally stressed as a result the crave for attaining STEM goals and objectives in schools (Vega and O'Donnel, 2025). However, novice teachers are also prone to burnout, which means that burnout is not only restricted to veteran teachers, but it can also develop in the first years of employment. Beginning teachers more often have feelings of anxiety due to the fact that they are inexperienced in their fields (Chang, 2019). For example, if they constantly fail in classroom management and in coping with students' disruptive behaviors, burnout may occur. Studies abound on the major triggers of teachers' burnout in learning institutions. For example, Skaalvik and Skaalvik (2019) explained factors responsible for burnout among teachers to include lack of fairness, organizations' values, role conflict and role ambiguity, lack of social support, lack of support from supervisors, lack of feedback and praise, little participation in decision making, and lack of teacher autonomy. Other factors are, but not limited to, pressure, fear of violence, poor opportunities for promotion, and unreasonable salary (Stewart, 2018). From another study, holding a position for a long time, excessive paperwork, large schools with overcrowded classrooms, the lack of equipment, students' behavioral problems, isolation, and poor social relations (Herman *et al.*, 2018). Teachers are usually high achievers who like to work hard and are always looking for ways to improve.

It's important to recognize that burnout is a complex issue influenced by numerous factors, including workload, lack of resources, administrative support, and work-life balance. Addressing burnout requires creating supportive work environments, promoting mental health awareness, offering resources for stress management, and fostering a culture where seeking help is encouraged for everyone, regardless of gender. In a study by Maslach (2018), it was revealed that burnout negatively affects teachers' self-confidence, motivation, self-esteem, and productivity levels. In another dimension, Madigan and Curran (2021) unveiled that teachers' burnout also affects students' academic performance, in another words, low academic achievement and motivation observed in students are linked to teachers' burnout. This appears to be the case of learning biology, and even more so for teaching biology with a time limit. From the research conducted by Hurley (2021) on teacher's burnout as a syndrome that is produced by the mismatch of unrelenting pressure, demands, and stress among teachers and the resources needed to cope with them, indicated that teaching is among the most stressful professions. In his report, over 90% of teachers have reported experiencing job-related stress, while an estimated 46% reported high stress on daily basis. From this review, it is apparent that burnout negatively affects teachers' self-confidence, motivation, self-esteem, and productivity. By implication, teachers with burnout might not be able to enhance students' acquisition of 21st century skills as advocated in STEM education to fit the technology-driven world. This is because students acquire the necessary knowledge of all aspects through the teacher, who serves as a medium of instruction. As a source of information to students, teachers must be free of all distractions and problems capable of deterring effective classroom instruction,



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which consequently could undermine the achievement of STEM education goals and objectives, not only in Nigeria, but in all nations of the world.

### Conclusion

Based on the illuminated facts from the review in this paper, the authors therefore, concluded that teachers' anxiety and burnout have a negative influence on STEM education. Thus, if teachers are subjected to anxiety and burnout as a result of excessive workload, poor incentives, and a teaching learning environment and other factors so far highlighted, effective teaching of STEM cannot be ascertained. Consequently, the attainment of STEM education objectives could remain a mirage rather than a reality in Nigeria and other societies with the same characteristics across the globe.

### Recommendations

From the review in this paper, the authors made the following recommendations:

1. Stakeholders in STEM education should collaborate with curriculum designers to address teachers' burnout through creating supportive work environments, promoting mental health awareness, offering resources for stress management, and fostering a culture where seeking help is encouraged for everyone.
2. Teachers should be assigned duties appropriately to avoid overworking or overburdening, causing burnout in some of them, in schools, to enhance their productivity
3. There should be adequate motives and incentives for teachers in schools to make them happy and improve their efficiency in the achievement of STEM education objectives
4. There should be counseling services for teachers in schools to control and prevent anxieties that have adverse effects on them and the education system

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