RE-THINKING SCIENCE TEACHER EFFICACY FOR SUSTAINABLE SCIENCE EDUCATION IN NIGERIA

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ABSTRACT

The global pandemic is a threat to the existence of everyone in the world today. Therefore, it is consequent on the educational process, and the logical tasks that accompanies emergency situations such as COVID-19. This kind of situation is transforming the mode of teaching and learning in the world, particularly in Nigeria, and it calls for a re-think on Science Teacher Efficacy to sustain science education in Nigeria. Hence, this is an academic discourse of;

1. Teacher Efficacy
2. Science Teacher Efficacy
3. Construct of Science Teacher Efficacy

Keywords: Science Teaching, Teacher Efficacy, Inclusive, Pandemic, Embedded .

INTRODUCTION

Globally, governments at all levels are compelling citizens to avoid gathering at public places including schools, to curtail the spread of COVID-19. Afterward, the pandemic has implications on teaching and so places a demand on what teachers can do to sustain teaching and learning in schools. Miller (2020) despite apprehensions from every nation for social distancing maintains that isolation can be detrimental to development, but noted that we are fundamentally social beings that must stay connected by all means. However, it is not imperative but rather appropriate in time like this to embrace education with the only alternative of social sustenance.

Therefore, Federal Government of Nigeria, FGN (2020) having the education of citizens in mind submits that COVID-19 has changed everybody and so pleaded with stakeholders in education to device alternative, and to create a virtual learning environment for schools not to completely shut down during the lockdown. Hence, the request for teachers at all levels to take advantage of technology calls for the development and maintenance of strong social connections because of the efforts to slow down the spread of COVID-19. These social connections involve online meetings and chats with colleagues and students (Collie and Martin, 2020). In addition, Learning Management Systems, webinars, e-conferencing, Zoom or Skype, phone calls, and other social media such as, WhatsApp, Messenger, Facebook, and others.

The commencement of separation from all public places including schools will require that teachers adjust their frame of mind, emotions, and actions to navigate the new ecosystem of practice. Collie and Martin (2020) revealed that sometimes situation in teaching and learning process can suggest a new kind of ecosystem that calls for teachers' adjustment of their thinking and attitudes about how students should learn. COVID-19 is one of those unexpected situations which places demand on teachers to reach their students through different social media with the support of internet and technology to teach. This kind of situation will require behavioral

adjustment to effectively manage any technical hitch; and emotional adjustment to overcome the anxiety and frustration that the new situation may bring. However, the impact of the deadly coronavirus is likely to challenge teacher efficacy as they cope with the new kind of situation in teaching. More often than not, a bad teaching experience or an unexpected teaching environment can be detrimental to teacher efficacy and performance in teaching. It should therefore be noted based on the previous assertion that teacher with little or no efficacy is not likely to try new methods of teaching, push through difficulty or, rather be persistent through challenges.

Teacher efficacy
Teacher efficacy according to The SHARE team (2020) is when teachers believe in their ability to guide students to success. It means that teachers with a strong sense of efficacy will have a tendency to be better in planning, resilient through failure, open-minded and supportive in teaching and learning process. Bandura (1986) describes efficacy as self-appraisal of capabilities to organize and execute an action that leads to a performance. This kind of beliefs system determines the level with which the individual persists in different situations, and even that efficacy belief can predict individual's motivation and choice according to Bandura (1994). Similarly, teacher efficacy can affect a teacher's actions and reactions in teaching situations and in turns determines the success of the lesson (Corry and Stella, 2018).

Teacher efficacy according to Alqurashi (2016) is a stimulant for teacher's commitment in achieving teaching and learning objectives, and so teachers with strong efficacy will be confident and capable to approach difficult task in classroom situations. It means failing in a task to teachers with strong efficacy is not total knock down but a platform to build up efficacy for the future (Bandura, 1997). Teacher efficacy is responsible for teachers' enthusiasm for teaching, professional commitment and positive influence on student achievement (Mojavezi and Tamiz, 2012; Gkolia, Belia, and Koustelios, 2014).

Science Teacher Efficacy
Predominantly, Roberts, Henson, Tharp, and Moreno (2001) submits that there is a relationship between teacher efficacy and science teaching because, science teacher efficacy is paramount to a new kind of practice in science teaching. Aydin and Boz (2010) posits that if students are performing low in science, it is most likely because of ineffective science teaching. Hodges, Gale, and Meng (2016) also submits that teacher efficacy is like a science method that is intended to enhance teaching practices. For instance, (Graham, Burgoyne, Cantrell, Smith, Clair and Harris, 2009; Minshew and Anderson, 2015) concludes that the use of technology in science teaching will basically depend on teacher efficacy.

Science teacher efficacy do not exist in isolation without some other belief structures and practical teaching contexts. Hodges, Gale and Meng (2016) showed that science teacher efficacy comprises of several antecedent factors like previous science experience, teacher preparation, or science teaching experiences. Additionally, internal factors such as attitudes toward and interest in science and the external factors, including the school environment, as well as students and community variables. Consequently, science teacher efficacy should be examined in the context of specific efforts to improve science teaching and learning in an unrestricted manner.

The importance of technology in education is becoming more glaring because of its benefits as one of the visible building blocks of the modern society (Hunter and Storksdieck, 2018). Technology encourages learning and supports education with its various applications to affect

the way teachers teach. Although, science teachers cannot but face the constraints of pedagogical skills and content knowledge in attempting to use technology in science teaching (Nawzad, Rahim and Wakil, 2018).

Construct of Science Teacher Efficacy
The construct of science teacher efficacy cannot be out of sight in teaching and learning situations to overcome the inadequacy of student's science background (Aydin and Boz 2010), and more importantly in an uncertain world of practice. Tschannen-Moran and Woolfolk Hoy, (2007) posit that science teacher efficacy generally refers to the teachers' efforts in science teaching, the goals they set, persistency when things do not go smoothly, and resilience on the face of setbacks. The previous is not different from the submission of Hassan and Tairab (2012) who shows that science teacher efficacy involves both expectations from students and personal belief in teaching abilities. These two dimensions of teacher efficacy are determined by many teacher characteristics and behavior such as experience, gender, and academic subject matter.

However, Riggs and Enochs (1990) have earlier shown in a study on teacher efficacy among a group of science teachers that teachers with higher sense of personal science teaching efficacy are more likely to exert great effort to achieve their teaching objectives and as well persist longer in the face of obstacles when compared to those who have lower sense of personal science teaching efficacy. In contrast, science teaching outcome expectancy describes the science teachers' perceptions that certain action will produce particular outcomes (Bandura, 1997). Therefore, those who have higher levels of science teaching outcome expectancy would indicate the confidence that effective teaching could overcome factors that might compromise student learning compared to those who have low science teaching outcomes expectancy (Settlage, Southerland, Smith and Cegtie, 2009).

Teacher efficacy is also greatly influenced by contextual factors, such as the teaching resources available to teachers, as well as interpersonal support available. This was discovered in a study conducted by (Inthiga, 2016) that teacher efficacy has a strong bearing with teacher training environments where teachers that lacked adequate resources are characterized with low morale, and disorganized support mechanisms for teaching. Teachers are faced with numerous demands and challenges in classroom situations where effective teaching cannot be guaranteed without teacher efficacy (Kunter, Klusmann, Baumert, Richter and Hachfeld, 2013).

Kothagen (2009) posits that every teacher requires sense of humor and flexibility to deal with classroom situations because no planning can anticipate all the situations or conflicts which may possibly occur in teaching. In addition, according to (Corry and Stella, 2018) there are differences in the face-to-face and face-to-screen classroom context while teacher efficacy will determine the task specificity of teaching and learning in both situations.

Therefore, teachers have an endless opportunity to be creative and as well stimulate change in their students according to Dewey (1944) who opines that "if we teach today as we taught yesterday, we rob our children of tomorrow". Technology is at our fingertips and it can help teachers to become remarkable in teaching and learning process if it is maximally utilized. Technology competes with people although, Babu (2018) revealed that technology should not replace teachers even with instances where technology alone may serve a particular purpose. However, Molčanová (2017) posits that technology will never replace teachers, but a teacher who cannot teach with technology will be replaced by another one who can teach with technology.

CONCLUSION

This work is based on the perspective that science teacher efficacy is considered necessary for science teachers to cope with science teaching and learning in an uncertain world of practice. Teachers today are recurrently aware that they must take responsibility for the sequence and consequences of their teaching actions in order to meet the needs of the present age students. Additionally, this assertion begins with the mindset that students' success in every learning situation starts with strong teacher support which cannot be distant from teacher efficacy.

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