**TEACHERS’ EMOTIONAL INTELLIGENCE AND PEDEAGOGICAL KNOWLEDGE AS INGREDIENTS FOR THE AQCUISITION OF 21ST CENTURY SKILLS AMONG POST-PRIMARY STUDENTS IN NIGERIAN LEARNING INSTITUTIONS**

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ABSTRACT

*The contemporary world is posed by numerous challenges geared towards the attainment of technological developments. It is a fact that 21st century skills are required among young scientists expected to drive the world to the target promise land of those developments which can only be acquired through effective teaching and learning of sciences. This paper discussed teachers’ emotional intelligence and pedagogical knowledge and how they impact students’ performance in post-primary schools and in general, how they can pave path to the acquisition of the desired 21st century skills among learners. It further reported some theoretical and empirical evidences of the impact of emotional intelligence consisting of self-awareness, self-motivation and social awareness among science teachers. In addition, the authors buttressed on the concept of teachers’ pedagogical knowledge and how it enhances effective learning of sciences. The paper highlighted more on how the two qualities were found impactful on students’ performance in sciences in several studies across the globe. Eventually, the authors suggested among others that school administrators should be having periodic assessment of teachers’ emotional intelligence and pedagogical knowledge as a motive to enhance quality teaching of sciences that will improve* acquisition of the 21st century skills in secondary schools in Nigeria and the world in general.

***Keywords****: Teachers Emotional Intelligence, Teachers’ Pedagogical Knowledge, 21st Century Skills, performance, sciences.*

**Introduction**

Multi-dimensional scientific and technological developments of any nation depend on the quality of education it provides to its people. There has been great scientific and technological breakthrough from ancient to the contemporary worlds with much expectations not yet achieved.These scientific and technological developments are evident in general facets of living ranging from communication, transportation, industrialization, shelter, education, general infrastructure, economy, to mention but a few.

Nigeria is one of those nations in the world that has been investing massively in education as to enhance the achievement of its national development. Teaching and learning of science and technology has been in practice across learning institutions in Nigeria since independence with tremendous achievements. Among those achievements are the integration of Information and Communication Technologies (ICTs) and application of innovative teaching and learning strategies which enhanced rapid enrolments in schools and improvement of quality education.

Science Education is a field of study that involves producing scientifically enlightened individuals in the area of Science, Technology Engineering and Mathematics which meets the basic needs of a sustainable Society. Science Education according to Bruce (2022) has many importance which include providing students and adults with the habit of solving their everyday problems as scientists do using logic experiments and evidence. However, teaching and learning of Sciences has been faced with numerous challenges. Most of these challenges are caused by either Teacher factor, Students factor, or Government factor.

**The Crave for the 21st Century Skills in Learning Science and Technology**

From the coming of the world in to the 21st century, there have been tremendous transformations of different aspects of life that triggered the need to have human resources rich of certain skills to cope with challenges. Acquisition of 21st century skills is a contemporary pressing international concern (Asia-Pacific Economic Cooperation. 21st century skills are those skills required by an individual to enhance developments in immediate and larger society(Central Board f Secondary Education, 2020).They include 5Cs which are communication, collaboration, critical thinking, problem solving and creativity(Partnership for 21st Century Skills-P21,2020). Learners are expected to be nurtured and brought up with those skills in any sound school system with effective curriculum implementation. These can be achieved only if teachers are resourceful, intelligent, knowledgeable and experienced.

 **Teachers That can Enhance the Acquisition of 21st Century Skills**

It remains a fact that effective learning depends on the effective teaching. Thus, emphasis must be laid on the quality and experience of teachers in learning institutions. For instance in Nigeria, the continued decline in performance of students’ annual final examinations, particularly in sciences has been raising signals to the stakeholders in Education and Researchers over time (James, 2018). Qualitative Education cannot be attained without having a look at teachers. This is because; teachers are the implementers of the school curriculum and hold a crucial position in the Educational sector. Some of the essential responsibilities of teachers include the organization of classroom activities and managing the behavior of students. This therefore, underscores the relevance of specific pedagogical knowledge and high emotional Intelligence among teachers to enable them manage students’ behavior and influence students’ performance during teaching and learning instruction.

Emotional intelligence is one of the psychological constructs that helps an individual understand his emotion and the emotions of others. A teacher with high emotional Intelligence is expected to be able to monitor, access, express and regulate emotions. Macchann *et al.* (2020) defined Teachers’ Emotional Intelligence as the capacity of teachers to recognize their feelings and that of others. Emotionally intelligent teachers are stable and have control over their emotions. Emotional intelligent teachers are also able to manipulate their environment to achieve their desired goals. The main sub-constructs of emotional intelligence are self-motivation, self-awareness and Social awareness.

Self-motivation plays a vital role in every sphere of life and various phases of activities. Teachers’ success and achievement in life depend on their self-motivation which is said to be the ‘Heart of teaching’, ‘the golden road to teaching’ and ‘a potent factor in teaching’ (Macchann *et al.,* 2020). Adequate Self-motivation by teachers’ results in reflection, attention, interest and effort in teaching and hence fosters learning by students. Self-motivation has become a central construct in Educational and Psychological research and plays a significant role in several theories of human development and learning. Teachers’ Self-motivation is concerned with the inculcation and stimulation of learner’s interest in the learning activities (Linsell*et al.,* 2015). Great number of individuals misconceives self-motivation as a personal trait. However, it is a force that energizes the behavior of individuals or an act of stimulating interest in different activities among students. Teachers may be highly motivated to perform well in a task and utterly unmotivated in the other. This means that when teachers are motivated, they will work tirelessly to achieve their goals during teaching and learning processes.

Self-awareness on the other hand, is the ability to understand one's feelings, attitudes and behavior. Increasing Self-awareness has important implications for academic performance because several studies have shown that practicing mindfulness is an effective and efficient technique for improving cognitive function resulting in increased test performance, memory and reading comprehension (Abraham &Scaria 2017). Self-awareness is to inform teachers’ need to identify feelings and how they affect students’ performance. Consequently, teachers’ Self-awareness is key to identifying areas and responding to students' strengths and weaknesses. Macchann *et al.* (2020) describe Self-awareness as the foundational building block of an individual’s Emotional Intelligence as individuals high in Emotional awareness recognize how feelings affect one’s performance. Andrei *et al.* (2016) also agreed that emotional health is fundamental to effective teaching and that the most critical element of a teachers’ success is an understanding of how to teach. He added that teachers who are self-aware and intrinsically motivated would have very high classroom management practices.

Social awareness is the ability to enter and sustain satisfactory interpersonal relationships. According to Sarrionandia*et al.* (2018), Social awareness emphasizes social relationships and social influence. Teachers with good sociability have better social interaction. They have good listening skills and can communicate clearly and confidently with students from diverse backgrounds. Teachers with Social awareness empathize with others, comprehend and accept the emotions of others as well as see things from another person’s point of view and therefore develop a stronger bond and understanding with them. High Self-motivation, Self-awareness and Social awareness can therefore contribute positively to a teachers’ teaching effectiveness. However, teachers with low Self-motivation, Self-awareness and Social awareness would find it to be more challenging to deal with, that can result to students’ failure. By implication, this may undermine teachers’ effectiveness and students’ active participation in the classroom activities as well as performance in their final examinations. For instance, Jain *et al.* (2018) believes that teachers who lack Emotional intelligence show some adjective challenges or in some ways, fail to handle the demands of school work effectively. It may not be out of place to notice that such teachers having little or no Emotional intelligence and as such would not attain personal goals in the classroom activities.

**Model of Emotional Intelligence Theory**

The ability model of Emotional Intelligence theory was propounded by Mayer, et al (2000). The theorists believe that for individuals to be emotionally intelligent, they should be able to perceive, understand and manage their emotions and the emotion of others. The proponents of this theory also posited that people with high emotional intelligence might enjoy the most success in life than others who surpass them in mental intelligence. Such individuals also tend to use more effective coping strategies in their daily life. This theory suggests that emotionally intelligent people form stronger emotional bonds with others and enjoy tremendous career success. They added that emotionally intelligent people avoid intense depression, anger or anxiety and work more effectively towards long-term goals by controlling impulses for immediate gratification. Thus, when the teachers acknowledge their emotions, they will have a good working relationship with the students and this will go along way to improve students’ performance in the classroom instruction, and by extension, facilitate their acquisition of the 21st century skills.

**Empirical Studies**

Studies abound, that revealed the significance of teachers’ emotional intelligence in effective teaching and learning of sciences. To cite few of the studies, Mamat and Ismail (2021) carried out a study on teachers’ emotional intelligence and best practices for classroom management. The purpose of this phenomenological study was to understand how middle school teachers describe their use of the four elements of Emotional Intelligence (Self-awareness, Self-management, Social awareness, and Relationship management) to reduce student behavioural referrals. A sample of middle school teachers from San Bernardino and Los Angeles counties participated through in-depth interviews. Reported benefits of Emotional Intelligence included better relationships with students, higher levels of student engagement, and more trusting relationships. Reported barriers included student home lives and limited training for Emotional Intelligence.

In another study, Katanani and Sakarneh (2021) studied the influence of emotional intelligence on the academic achievement of gifted students in Saudi Arabia. They studied the influence of Self-awareness, Self-regulation, Motivation, Empathy, and Social skills on the academic achievement of gifted students. One hundred and fifty respondents consisting of both male and gifted female students were involved in the quantitative study, and 10 teachers and 30 gifted students participated in the qualitative research. Multiple regressions were used to analyze and interpret the quantitative data, particularly the influence of Emotional Intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) on the academic achievement. Findings revealed that Teachers’ emotional intelligence has effect on the academic achievement of the students.

Macchann *et al.* (2020) in this chain of research studied the role of Emotional Intelligence (Social awareness, Self-awareness, Self-motivation and Empathy) in the classroom teaching practice of high performing high school mathematics teachers. Data was generated qualitatively through semi-structured interviews. Five mathematics teachers from five high schools in Pretoria, Gauteng, were selected. Content analysis, which involves analyzing qualitative data through summaries and data interpretation, was employed. The findings revealed that emotional intelligence in the classroom plays a major role in dealing with or addressing the day-to-day challenges teachers face. The results also showed that teachers must have specific skills to cope with classroom pressure and challenges.

These few cited reports are reliable indication of the relevance of teachers’ emotional intelligence in improving learning of sciences especially in this 21st century.

**Teachers’ Pedagogical knowledge**

Another important variable of this study is Science Teachers’ Pedagogical knowledge. Pedagogy is the term used to refer to the Art and Science of teaching methods. Pedagogical knowledge refers to the specialized knowledge of teachers for creating effective teaching and learning environment for all students. Pedagogical knowledge refers to one’s knowledge of teaching and learning processes independent of subject matter and also the knowledge of classroom instruction. Just like there are various teaching methods to consider, each student brings different learning styles, preferences, and strengths into the classroom. Educators must understand a variety of Pedagogical theories and approaches to teaching, as well as how to apply those methods to best meet the needs of each of their students. Also, teachers' Pedagogical knowledge includes all the required cognitive knowledge for creating effective teaching and learning environments and research suggests that this knowledge can be studied (Guerriero, 2014). Teachers Pedagogical knowledge includes; knowledge of Brain development, knowledge of Cognitive Science, knowledge of Collaborative learning, knowledge of Classroom management and School laws.

**Theory of Teachers’ Pedagogical knowledge**

**Shulman’s theory on pedagogical knowledge**

Cochran *et al* (1993) revised Shulman's original model to be more consistent with a constructivist perspective on teaching and learning. They described a model of Pedagogical content knowledge that results from an integration of four major components, two of which are subject matter knowledge and Pedagogical Knowledge. The other two components of teacher knowledge also differentiate teachers from subject matter experts. One component is teachers' knowledge of students' abilities and learning strategies, ages and developmental levels, attitudes, motivations, and prior knowledge of the concepts to be taught. Students' prior knowledge has been especially visible in the last decade due to literally hundreds of studies on student misconceptions in Sciences. The other component of teacher knowledge that contributes to Pedagogical Knowledge is teachers' understanding of the social, political, cultural and physical environments of the students. This model shows that these four components of teachers' knowledge all contribute to the integrated concept called ‘Pedagogical Knowledge. Pedagogical Knowledge is believed to continue to grow with teaching experience.

**Empirical Studies on Teachers’ Pedagogical knowledge**

There are vast studies in line of research. In this paper, the authors will report few findings on the significance of teachers’ pedagogical knowledge in learning. To start with, Omenka and Otor (2015) investigated the influence of teachers’ Pedagogical Knowledge, specifically teachers’ classroom management on students’ academic achievement in Science and Mathematics in Oju Local Government Area of Benue state. Descriptive survey design was adopted for the study using influence of classroom management on students’ academic achievement in Science and Mathematics questionnaire. Data obtained were analyzed using descriptive and inferential statistics. The findings established that classroom discipline which is a trace of teachers’ pedagogical knowledge, and motivation significantly influenced students’ academic achievement in Science and Mathematics.

In another study, Farhat *et al.* (2020) examined classroom management (teachers’ Pedagogical Knowledge) and Students’ Academic performance in secondary schools in Nyamagabe District- Rwanda. The study adopted a case study design, stratified and purposive sampling found appropriate for the study. The study involved five schools and a sample size of 120 respondents selected from among teachers, heads of departments, dean of studies and head teachers. Data was collected by the use of questionnaires and interviews, the study results revealed a positive relationship between classroom management and students’ Academic performance This means that effective classroom management leads to good students’ academic performance, while poor classroom management results from poor students’ academic performance. From the conclusion drawn, the researcher recommended that teachers and school administrators improve classroom management as it dramatically influences students’ academic performance.

**Conclusion**

The significance of teachers’ emotional intelligence and pedagogical knowledge cannot be over emphasized in teaching and learning of science and technology. The two characteristics proved positive and productive in enhancing performance and 21st century skills acquisitions. Focusing more on teachers’ emotional intelligence and pedagogical knowledge will go along way in the provision of students with 21st century skills that can help nations achieve 21st century goals in science and technology.

**Recommendations**

The authors recommended that:

1. In teachers’ recruitment, emotional intelligence and pedagogical knowledge should be assessed as to improve productivity in teaching

2. Acquisition of skills should be given more priority during teaching and learning activities

3. There should be consistent seminars in schools in order to update teachers with innovative teaching strategies and pedagogies as to improve quality of teaching.

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