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# School Technology Leadership: A New Concept

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**ABSTRACT**
Technology leadership is a new concept in school leadership, and it involves school principals creating and sustaining support for effective use of ICT in teaching and learning. Schools in the developed countries have being practising this aspect of leadership, but in Nigeria, most school leaders are not familiar with the term. Technology leadership is known to be a process of providing support for teachers to use computers to make teaching and learning meaningful and productive in the 21st century. This paper takes a critical look at the various definitions of technology leadership by scholars. Leadership theories such as path-goal and transformational leadership were used to clarify the concept, while the roles of a technology leader which are vision statement, planning, staff development, infrastructure support, evaluation, research and interpersonal communication skills were described. The paper concluded that technology leadership is an integral part of school administrators' roles therefore, school principals should endeavour to become technological oriented leaders.
**Keywords:** Technology Leadership, Information Communication Technology

## INTRODUCTION

Leadership as an important concept in educational management involves working with teachers and guiding them towards improving educational processes. It also involves harnessing talents and potentials of teachers and tailoring them towards achieving educational goals, which is briefly, improved teaching and learning. Leadership then, can be said to be of primary importance to learning and as such is needed for higher levels of school achievement.

Educational leadership has been defined by many researchers such as Yuki, (2013),as the ability to influence subordinates to be capable of task performance. Heifetz and Laurie (2010) defined it as the ability to engage followers in confronting challenges, adjusting their values to achieve organizational goals. Educational Leadership is the ability to move a school forward through the help of staff members, and it determines the survival of an institution. Educational leadership therefore involves creating a vision statement of academic excellence; fostering a conducive teaching and learning environment for both students and teachers, and building leadership squad among teachers. It is an important concept in Educational Management, and researchers in Nigeria have extensively discussed aspects of leadership such as instructional leadership which has to do with teaching and learning, democratic leadership which implies collaborating with subordinates to make decisions, autocratic leadership which is leading by coercion, and laissez-faire leadership which has to do with subordinates making decisions without interference from their leaders(Adeyemi & Adu, 2013; Okoroma,2007).

Recently, researchers have noted a new kind of leadership among principals in United States of America, Taiwan, Canada and Malaysia known as technology leadership (Billheimer, 2007; Chang, Chin & Hsu, 2008; Flanaga &Jacobsen, 2003; Hamzah, Juraime & Manor, 2016). The concept came in the 1980s with the introduction of ICT in schools (Davies, 2010). Shortly, this was followed by studies to assess the impact of information and communication technology (ICT)

on teaching and learning. These studies gave rise to the need to train principals to become technology leaders for the effective integration of ICT in teaching (Davies, 2010).In 2001, the International Society for Technology in Education in America (ISTE, 2001) developed technology standards for school administrators known as National Education Technology Standards for Administrators (NETS-A). Its purpose was to provide assistance and guidelines for administrators to become effective technology leaders. Since then technology leadership academics have been established in every State in United States of America (Chang, Chin, & Hsu, 2008). In Nigeria, the case is not the same, even with the establishment of ICT policies by the Government (FRN, 2001) and the availability of ICT in schools. School principals are yet to realise the importance of technology leadership to enhance teaching and learning in schools. The objective of this paper is to examine the concept of technology leadership, the theories of technology leadership and the roles of technology leaders, and suggest a way forward for Nigerian school leaders.

**The Concept of Technology Leadership**

Technology is the changing of the human environment through the use of tools. Mishra and Koehlar (2006) defined it as a tool created by man to produce products, solve problems, fulfil needs or satisfy wants. Technology focuses on making things happen. Technology, as used in this paper, refers to Information and Communication Technology (ICT). It includes any equipment or interconnected system or equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data and information (Nigerian National Policy on Information Technology, 2000).

Technology leadership is defined as a combination of various leadership strategies and techniques required to assist teachers use technology to improve instructional practices in the classroom (Schmeltzer, 2001). This definition means that technology leadership comprises leadership skills and styles as well as ability to use and manage technology. Okeke and Dike (2019) defined it as skills and behaviours needed by school leaders to create and sustain support for ICT use and integration in schools. These skills are the ability to articulate clear vision statements for ICT use: planning for effective ICT integration in schools, organising staff development programmes for staff; providing support for technology infrastructure in schools, evaluating the outcome of ICT usage in schools and researching on recent technology advancements. These aforementioned skills were drawn by Chang (2012) from general leadership principles. Yee (2000) defines it as the ability of school leaders to manifest technology knowledge, skills and behaviours required for ICT integration in schools. Samah and Fooi (2000) noted that these abilities have to do with jointly creating a vision of ICT, modelling effective use of ICT in teaching and learning, evaluating ICT in schools, and acquiring ICT skills.

Since the introduction of computer studies in the Nigerian educational system, it is not surprising to see computers littered in school laboratories and classrooms. These computers have not being adequately utilized by teachers in schools. (Eze & Aja, 2014; Eze & Akubuguo, 2016). Using technology in teaching and learning have been seen as a way of preparing students to be relevant in a computer driven society. School principals need to prepare themselves to take up the role of technology leaders so as to prepare students for the future. They must ensure that technology is used as a tool to promote teaching, learning and administrative purposes. Teachers and students need the support and vision of tech-savvy school administrators to harness their full potentials in the use of technology (Holland & Moore-Stewart, 2000).

McLeod and Richardson (2011) noted that being a technology leader has to do with acquiring a unique set of skills and competencies, while Afshari, Bakar, Luna, Samah and Fooi (2000) noted that the school leaders in their effort to be technology leaders should first inspire staff to jointly create a vision of technology with them; model effective use of ICT in the areas of teaching and learning; work towards incorporating ICT in the management and operation of their schools and finally be part of the assessment and evaluation of ICT in their schools. Hence, school

administrators need to be trained on how to use and integrate ICT tools into their school learning culture (Richardson et al., 2013). School principals are expected to lead teachers in mastering computer skills and knowledge by integrating every aspect of the curriculum with ICT. Johar (2011) stated that effective ICT skill based school leadership is important in determining whether technology use can improve teaching and learning in the school. This is because majority of school leaders are not sure if ICT can improve and enhance both effective teaching and learning.
Chang (2003) developed technology leadership roles for school administrator. These roles are vision, planning, staff development, interpersonal communication skills, technology infrastructure support, research and evaluation. According to Chang (2012), these dimensions were the principal's major tasks in dealing with teaching and learning that involves ICT in schools. Since the release of these standards schools have been using them to measure the level of a school administrators' technology leadership.

**Technology Leadership Theories**

Path- Goal leadership theory and Transformational leadership theory explained the concept of technology leadership better because they are centred on innovation and change.

**Path- Goal Leadership Theory**

This theory was posited by Robert House, in 1971 and revised in 1996. It stated that a leader's behaviour is concerned with enhancing "follower performance and follower satisfaction by focusing on follower motivation" (Northouse, 2016, p.115). According to Northouse, (2016) this theory of technology leadership is concerned with leaders guiding their subordinates towards ICT goals. Leaders help followers' motivation by making the path- goal clear, removing obstacles / roadblocks that followers might meet in the process of goal attainment (Northouse, 2016).
The path-goal theory has its major component parts as "directive, supportive, participative and achievement leadership behaviours" (Northouse, 2016). Directive leadership behaviour is characterized by leaders who articulate clear vision for ICT use and guide teachers who might have no vision at all. The supportive leadership behaviour is characterized by leaders that are friendly and approachable, concerned about workers' wellbeing. The leader encourages teachers as they integrate ICT into teaching and learning. When leaders display this behaviour, teachers become motivated and willing to follow their lead. In the participative leadership behaviour, the leaders ask for teachers' opinions before taking decisions on which hardware and software should be purchased and also on how to go about the integration of ICT into classroom. This behaviour brings out the need for clarity on roles of the teachers.
The achievement oriented leader pushes his followers to reach for perfection or excellence in performance. The principal encourages and gives teachers opportunities to excel, and develop confidence in the use of ICT in their teaching Path goal theory, helps principals to use various actions such as ICT training and providing support systems to help teachers utilize ICT in their classrooms. The theory expects principals to carry all the staff along, elucidating every aspect of the integration process and removing every obstacle in the form of barriers to ICT integration, this will help the goal and vision of ICT in that school to be achieved.

**Transformational Leadership Theory**

James MacGregor Burns was the first to formulate the concept of 'transforming leadership'. He defined transforming leadership as a relationship where there is mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents (Burns, 1997). Bass (1985) adapted the construct and developed it to transformational leadership. Transformational leadership according to him, enlarges the teachers' portfolio of needs; changes teachers' self-interest; improves the confidence level of teachers; promotes teachers, expectations; raises the value of principals' intended outcomes for the teachers; inspires change in the behaviour of teachers and motivate them to higher levels of personal achievement (Bolden, Gosling, Marturano, & Dennison, 2003). Yuki (2009), defines transformational leadership as the process of influencing major changes in the behaviour and assumptions of organizational

members and building commitment for the organizational vision, objectives and strategies. Researchers have noted a set of leadership behaviours that provide the foundation for successful school leadership (Leithwood, 1990; Leithwood & Jantzi, 1996). These leadership behaviours include vision, group acceptance goals, individualized support, intellectual stimulation, and high expectations (Leithwood, 1990; Leithwood & Jantzi, 1996).

School leaders who understand the need for effective technology leadership inspire teachers and communicate the vision clearly and convincingly to them. They foster the acceptance of group goals, by preaching cooperation and support among teachers and encourage them to work towards ICT goals. In providing individualized support, school principals show respect and support to staff members and attempt to satisfy their needs and aspirations through interpersonal communication skills (Leithwood, 1990). In providing intellectual stimulation, principals show interest in teachers' development needs by providing staff development opportunities. The principals support, coach and mentor teachers to become innovative and creative with ICT tools (Bass, 1999). School administrators also encourage teachers to indulge in reflective practices and provide information and resources to assist them. In holding high performance expectations, school administrators state expectations for excellence, quality, and high performance to the teachers and the school community to know, what is expected of them (Leithwood & Jantzi, 1996).

The school administrators in their function as technology leaders have to take on the role of transformational leaders to achieve the goal of ICT in their schools. A transformational technology school leader creates vision; develops plans, empowers stakeholders through staff development and later transforms the school. They integrate ICT into the school teaching and learning through sharing knowledge of ICT and participation in staff development.

This leadership style helps to increase the awareness of ICT in the school and encourages the teachers to go beyond their interest in ICT for the good of the school. Transformational leadership when practised by a school leader motivates teachers to go extra lengths to acquire the necessary skills for creativity and innovation, obtained the change required and experiment more with new technologies. In other words, schools need administrators who can raise teachers to the levels where they can integrate ICT through creative and innovative behaviour. Technology is not static, it changes with time, and in order for a schools' educational system to keep up with this change, transformational leadership is necessary.

**Roles of a Technology Leader**

The technology leader has important roles to play in ensuring that his staff and students benefit from recent innovations from ICT to enhance teaching and learning. They include the following:

1. **Articulating a Clear ICT vision**

Vision development is one of the roles of a technology leader. It involves a process of defining a mission statement that shows the strategies that will bring about the achievement of pre-determined ICT goals (Niekerk,2000). In vision making the technology leaders first develop their personal visions on ICT use, then merge it with the visions of their staff. The vision is then clearly communicated to staff members by the principals. Vision statement provides direction and guidance to staff for technology integration to succeed in schools. Its importance was noted by Chang (2012), when he said that vision statement is the foundation of technology leadership.

2. **Planning for ICT Use**

In planning, the technology leader lists various steps to be taken to achieve the ICT vision. The planning starts with outlining achievable goals, indicating roles for key actors and describing functional needs and resources (Kloom, 2000). For instance, the principal find ways of purchasing ICT equipment; hires technicians to maintain the equipment; establishes ICT committee in the school and fosters a supportive environment for ICT integration.

3. **Staff Development**

A technology leader provides activities required to help staff integrate technology in the school. This is done by providing a training program which ranges from conferences, workshops, seminars and peer coaching that meet the needs of the school. Successful staff development usually supports the schools' ICT vision and mission and is tailored towards improving teachers and pupils performance. According to Grady, 2011; effective staff development includes:

a. Identifying teachers' previous ICT skills.
b. Arranging activities that match their skills
c. Scheduling and deliver the ICT activities
d. Repeating activities until teachers have mastered the ICT skills
e. Providing time and resources to allow sessions to be successful

**4. Technological and Infrastructural Support**

A technology leader provides support for ICT use in the school. This entails hardware maintenance and upgrading, hiring of technical support staff to assist teachers in the classroom and providing financial support through Parent Teachers Association & other educational stakeholders. School administrators who are technology leaders are mandated to provide teachers with appropriate technology facilities, resources and support with assistance when needed. According to Anderson and Dexter (2000), it is the duty of the principals to provide technology support in schools. They noted that the amount of money spent on ICT was a factor influencing technology leadership. This means that schools that budget enough funds for ICT facilities have better technology leaders.

**5. Evaluation**

A technology leader evaluates schools ICT programs to find out if it is meeting up with school's ICT goals and visions. Most schools expect improvement of pupils' academic performance after a period of instructing them using ICT. The principal assesses these outcomes through an evaluation process. It is through this evaluation process that expected outcomes are measured. The evaluation of ICT outcomes shows that principals are accountable to stake holders for providing support for ICT in schools. Evaluation is carried out during ICT staff development sessions, while ICT specialist are usually invited to access the effectiveness of ICT hardware and software.

**6. Research**

A technology leader carries out regular research to discover current technological advancements and how they can be used to make learning more interesting and meaningful. Research was found to be a factor in effective technology leadership (Chang, Chin, & Hsu 2008).This is necessary because technologies are not static, they keep changing. An effective technology leader should regularly update himself or herself in order to know these new technologies and how to use them in teaching and learning.

**7. Interpersonal Communication Skills**

According to Chang, Chin and Hus (2008) the ability to communicate well is an important technology leadership attribute. School principals should be able to build positive working relationship with staff, communicate changes taking place in the school, identify and support teachers' need and concerns (Chang, 2003). A good communicator is a person, who listens, empathizes, connects with people, and is able to teach, present and motivate individuals to achieve pre-destined goals (McEwan, 2013). Verbal and Non- verbal skills can be used by the school administrators to communicate facts, ideas and information, about technology.

## CONCLUSION

Technology leadership is an integral part of a school administrator's role in schools. School leaders should live up to their responsibilities and become technology leaders. Their guidance and direction are needed by teachers and students for effective use of ICT in teaching and learning. In Nigeria, it is my considered opinion that most school principals have no knowledge of their roles as technology leaders, and this has hindered the effective utilization of ICT in their schools. We

cannot continue to be ignorant of what is happening in the 21st Century. The world has gone digital, and schools need to be digitalize in order to be relevant. The school principals should facilitate the process of using these technologies to learn by developing a compelling vision of ICT use, planning for staff development and providing support for users of ICT in their schools. It should also be noted that any school principal that is not a technology leader would not only become obsolete and irrelevant, but also a conservative and reactionary leader.

## RECOMMENDATIONS

In view of the foregoing discussion, the following recommendations are necessary:

1. Ministry of education should create awareness among school leaders on the importance of technology leadership through regular seminars and workshops;
2. Intensive professional development programmes should be organized by the ministry for school principals on how to be appropriate technology leaders, and
3. Government should provide school principals with adequate funds to support ICT programs in schools.

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