

## Chapter 16

# Adopting Digital Technologies in the Administration of Technical and Engineering Education

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### ABSTRACT

*Available literature on the use and integration of digital technologies in education place too much emphasis on variables at classroom level and neglect other areas of possible application. Traditionally, they are more concerned with the prospects and limitations of digital tools in transforming the present isolated, teacher-centered, and text-bound classrooms into rich and student-focused learning environments using mainly presentational software such as PowerPoint and interactive whiteboard software, revision software, and online content services. However, the level of studies in the area adoption of digital technologies in education administration is still in its infancy, especially that which focuses on administration and management of Technical and Engineering Education. In order to have a fairly distributed literature, this chapter presents an up-to-date technical review on the applicability of digital technologies in school administration. Specifically, it examines the vast opportunities for the adoption of digital technologies in the administration of general education and its implication on Technical and Engineering Education. These emerging technologies provide a diverse set of technological tools and resources for effective and efficient administration of Technical and Engineering Education appropriate to the changing world of work.*

### INTRODUCTION

Technical and Engineering Education is concerned with the acquisition of functional knowledge, positive attitudes, and hands-on skills appropriate

to the dynamic world of work. Key to sustainable development in the contemporary knowledge based global community is a functional education that guarantees job creation, poverty alleviation, growth and social inclusion. Educational adminis-

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tration can be described as that force which directs human and material resources towards educational goals and standards. Management functions in education would reside with educational policy makers while administrative functions would refer to those day-to-day leadership roles of the school heads. Three main things are common in all forms of administration; policy formulation, resources allocation and policy execution (Musaazi, 1982). A major goal of every educational institution is changing the behavior of the students that spans from the levels of knowledge and skills acquisition to that of inculcation of right values and attitudes (F.R.N., 2004). Unfortunately, however these educational objectives are somewhat ambiguous and difficult to pursue. Surely difficulty of appraisal and goal immeasurability are unique characteristics of schools and other people processing organizations. These militate against meaningful and directive changes in school policies. Another peculiar feature of educational administration is the task of managing unlimited clientele system. The school is such a complex social system whose major functions seems to be delegated to it by the other systems, and to a degree, the effective functioning of the other systems depends on the effective functioning of the educational system. In Nigeria, recent increase in access to education at all levels brings about a corresponding expansion in terms of geographical distribution enrolment figures and subject offerings which explains why their problems increase not only in number but also in nature (Moja, 2000). No doubt, education is at the confluence of powerful and rapidly shifting educational, technological and political forces that will shape the structure of educational systems across the globe for the remainder of this century. The school is the only organization in which every member of the society considers himself as stakeholder. As a result, the school is vulnerable to much of public visibility and sensitivity so that the school is always being scrutinized even by those who know little or nothing about schooling. For schools to survive such pressures

they require proactive leaders with dynamic, sophisticated technical and managerial expertise. However, this does not imply subscribing to trait theory and the situational approach to leadership that were based on the organizational metaphor originating mainly in Taylorism and bureaucracy. Rather delineating an effective blend of certain leadership and managerial role skills right from routine classroom situation to high levels of decision-making. The trend is such that the more we appreciate the differences between leadership and management, the better we understand that they are inseparable.

In recent years there has been a groundswell of interest in the rapidly shifting paradigms that challenge traditional structure of educational systems across the globe as a response to a changing world of work. These changes are brought about by digital technologies which combine the traditional elements of hardware and complete software solutions to provide a wide range services. They provide diverse set of technological tools and resources for effective and efficient administration of technical and engineering education appropriate to the changing world of work. These tools comprise of a series of information and communication services used in many walks of life to collaborate at a distance with colleagues and implement cloud computing. Also available, is a series of technical and engineering solutions such as, industrial robots, Computer Aided Design tools, and modeling software that are ever increasing in flexibility and sophistication. Sequel to the unique nature of Technical and Engineering Education Programs, digital solutions and support services could differ slightly in the way and manner they are applied in general education administration. Areas of major differences such as special digital support services to help staff and students in workshop scheduling, tracking as well as retrieval of tools, equipments and machineries were comprehensively discussed. Novel approaches such as e-finance; facility management and automated energy optimization were all discussed as new tools applicable in financial,

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