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*Paix – Travail – Patrie*

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FACULTÉ DES SCIENCES DE

L'ÉDUCATION

DEPARTEMENT DE DE CURRICULA

ET

ÉVALUATIONS

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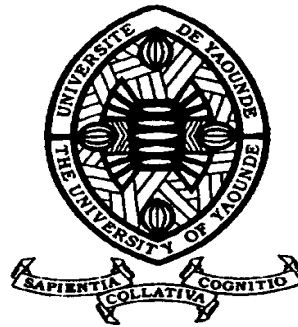
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REPUBLIC OF CAMEROUN

*Peace – Work – Fatherland*

\*\*\*\*\*

UNIVERSITY OF YAOUNDE I

FACULTY OF SCIENCES OF

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DEPARTMENT OF OF

CURRICULUM

AND EVALUATION

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POST GRADUATE RESEARCH

AND TRAINING

CENTER IN HUMAN, SOCIAL

AND

EDUCATIONAL SCIENCES

**EFFECTIVENESS OF INFORMATION AND  
COMMUNICATION TECHNOLOGIES IN THE  
MANAGEMENT OF SCHOOL ADMINISTRATIVE  
PROCEDURES OF GOVERNMENT BILINGUAL  
HIGH SCHOOL ETOUG EBE YAOUNDE**

A Dissertation submitted in partial fulfillment of the requirement  
for the award of a  
Post-Graduate Diploma in Educational Management (MED).

Par : TANYI TAKU NELSON

Bachelor's Degree (B.sc) in Management Sciences

Sous la direction de  
**BIKOI Félix Nicodème**  
University Professor

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Educational Engineering

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**Department: Curriculum and Evaluation**

**Specialty: Educational Management**

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*March 2018*

## DECLARATION

I declare that this project is my original work and has not been presented in any other University/ Institution for consideration. This research proposal has been complemented by referenced sources duly acknowledged. Where text, data (including spoken words), graphics, pictures or tables have been borrowed from other sources, including the internet, these are specifically accredited, and references cited in accordance in line with anti-plagiarism regulations.

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## **DEDICATION**

To my Dad, Pa'a Taku Eta John of blessed memory

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## ACRONYMS AND ABBREVIATIONS

AAU	:	Association of Africa University
CAL	:	Computer Assisted Learning
CAL	:	Computer Assisted Learning
CAT	:	Computer Assisted Teaching
CPT	:	Computer Programmed Teaching
ECA	:	Economic Commission for Africa
EPZ	:	Export Processing Zone
H.E.	:	His Excellences
ICT	:	Information and Communication Technology
WSIS	:	World Summit on the Information Society
EFA	:	Education for All
AUF	:	Agence Universitaire de la Francophonie
ISPs	:	Internet Service Providers
ITU	:	International Telecommunications Union
MINPOSTEL	:	Ministry of Posts and Telecommunication
MIS	:	Managed Information System
NICI Plan	:	National Information and Communication Plan
TICAD II	:	Tokyo International Conference for African Development II
UNESCO	:	United Nations Education Scientific and Cultural Organization
USA	:	United States of America
VLE	:	Virtual Learning Environment

## ABSTRACT

Information and communication technologies represent an important potential for educational innovations and an essential resource for ensuring the efficiency and effectiveness of administrative procedures within a school. This exploratory study attempts to measure the school administrators' perceptions of the effectiveness of the school-based use of information and communication technologies. This raises many questions about the relevance of the use of ICT in administrative procedures in schools. It is in this light that this work was conducted with the aim of identifying and analyzing the effectiveness of ICT in administrative procedures at the Government Bilingual High School Etoug-Ebe Yaoundé. To do this, the method used is based on the exploitation of the data collected from the teaching and administrative personnel targeted through the observations and the interview guide. This analysis shows that the efficiency of ICT in administrative procedures is significantly ( $p < 0.05$ ) recognized in the compilation of databases and the establishment of time tables. In addition, the administrative and pedagogical management domains, help develop the technological skills of the administrative staff but the logistical and software problems, the insufficiency and the lack of control of ICT tools are obstacles within the school.

**Keywords:** Effectiveness, ICT, management, administrative procedure, Bilingual High School, Etoug-Ebe, Yaoundé

## **RESUME**

*Les technologies de l'information et de la communication représentent un important potentiel d'innovations pédagogiques et une ressource incontournable pour assurer l'efficacité et l'efficience des procédures administratives au sein d'un établissement scolaire. Cette étude exploratoire tente de mesurer les perceptions du personnel administratif de l'établissement scolaire quant à l'efficacité de l'utilisation scolaire des technologies de l'information et de la communication en milieu scolaire. Ce qui suscite de nombreuses interrogations quant à la pertinence de l'usage des TIC dans les procédures administratives en milieu scolaire. C'est dans cette logique que ce travail a été mené avec pour objectif d'identifier et d'analyser l'efficacité des TIC dans la gestion des procédures administratives au Lycée Bilingue d'Etoug-Ebe Yaoundé. Pour ce faire, la méthode utilisée repose sur l'exploitation des données collectées auprès des personnels enseignants et administratifs cibles à travers les observations et le guide d'entretien. Il en ressort de cette analyse que l'efficacité des TIC dans les procédures administratives est reconnue de façon significative ( $p < 0,05$ ) à la confection des bases de données et à l'établissement des emplois de temps. En outre, les activités de gestion administrative et pédagogique contribuent à développer les habiletés technologiques du personnel administratif mais les problèmes logistiques et logiciels, l'insuffisance et la non maîtrise des outils TIC sont des freins au sein de l'établissement scolaire.*

**Mots clés :** *Efficacité, TIC, gestion, procédure administrative, Lycée Bilingue, Etoug-Ebe, Yaoundé.*

## GENERAL INTRODUCTION

This work presents a general overview of the use of ICT and its effectiveness in school administrative procedures in a public secondary school, precisely the case of Government Bilingual High School Etoug-Ebe Yaounde. The chapter is divided into the following sections: background of the study, statement of the problem, purpose of the study, objectives of the study, significance of the study, limitations of the study, scope of the study, and operational definition of terms. ICT (information and communication technology) in its widest sense is technological tools and resources used to communicate, create, organize, disseminate, store, retrieve, and manage information (Obi, 2002; Nwachukwu, 2004; Edefiogho, 2005; Chaka, 2008).

ICT does not only mean computers. It has to do with technological tools which according to Chaka (2008) include computers, the Internet, broadcasting technologies (radio and television), and telephone. This implies that ICT is a combination of computer and telecommunication application. ICT has contracted the world into a global village and as such has been recognized to be a vital tool for solving communication problem world over. According to European Commission (1995), G8 Nations (2000), Leach and Moon (2000), and Gusen (2001), ICT has proved to be a very powerful tool in educational reforms. Based on this, institutions in the last few years have been reviewing their mission, goals, strategies, and operations in order to position themselves more effectively to meet the challenges of the 21st century.

Therefore, in this world of rapid development, education which is perceived generally as an instrument by excellence by bringing about changes through inculcation of rightful values, skills, attitudes, and knowledge should be at the forefront of this movement. Cameroon institutions, of which secondary education is one, must become active members of this global movement in order to meet the challenges of this modern era. The success of any system of education is hinged on proper planning, adequate financing, and efficient administration. Without efficient and effective school administration, the aims and objectives of any educational system cannot be achieved. As ICT is sweeping through the global world, there is the need for Cameroon and her educational administrators to keep abreast of the principles and applications of ICT for an effective job performance. The school administrator must be up to date in the provision of the right information and enhancement of teaching, learning and specially the records, retrieving the institution distinctive information.



To achieve these objectives, the secondary school administrator has a crucial role to perform in the achievement of the goals of education and his/her performance determines the success or failure of the educational plan in his/her school. For instance, the objective of provision of trained manpower in the applied science, technology, and commerce cannot be achieved without keeping abreast with ICT appliances. An uninformed school administrator cannot provide an update information. According to Cussack and Skillier in Oboegbulem and Ogonnaya (2008), there have been increasing changes for administrators in the areas of leadership expectation, work demands, schools and personal accountability, human resources management, decision-making communication, power and authority, and planning. These changes demand that the school administrator must be computer literate to cope with the demands on him/her.

The process of information gathering and communication has advanced greatly in recent times. Humanity is currently in an electronic age (the e-age) an age characterized by bridging the gap between distance and time, giving way to information revolution built around information and communication (Ola, 2004; Ukwegbu, 2005). Never in human history has such a revolution been witnessed in which digital data has transformed the way we communicate in our homes, offices, market places, hospitals, churches, sports arena, legal environments and more importantly schools or educational concerns. UNESCO (2002) defined information and communication technology (ICT) as the range of technologies that are applied in the process of collecting, storing, editing, retrieving and transfer of information in various forms. ICT could therefore be understood as all those electronic devices that are used in broadcasting telecommunication and all other electronically mediated information gathering and dissemination processes.

The Association of Africa University (AAU) (2001) observed that as a complex organization, the universities' high rate of utilization of ICTs has helped to handle large volume of data which they must process speedily in order to provide information for management decision-making as well as meeting the information requirements of the various clientele—students, parents, alumni, government, information community, the general public. Okoli (2007) in Bassey, Okodoko and Akpanumoh (2009) classifies university records into two broad categories, namely management and administrative records. Management records are generated at the top management level (vice chancellor, deputies, bursar, librarian, and registrar) in the form of meeting records, procedures, decisions and resolutions. On the other

hand, administrative records take the form of admission records, personnel records (employment, leave and duty records), and physical resource records.

It seems that the growing complexities of universities in Nigeria and the challenges they pose to management makes the application of Hi-Tech information and ICTs indispensable for quality assurance (Okorie, Agabi and Uche, 2005 in Bassey et al., 2009). In Anamuah-Mensah's (2009) observation, record keeping was also enhanced through the use of ICT, hence enhancing productivity and cost-effectiveness. Hook (2004) found that the use of ICTs enhanced the transformation of learning outcomes for the gifted and talented. With ICTs, teachers were able to teach, communicate, maintain good records and evaluate these groups of children with high level of potentialities in them. According to Obeng (2004), ICT is an important tool in facilitating filling/recording system in the university since it is the nerve center of knowledge and innovation.

Besides, ACT HEALTH (2007) recognized the importance of using ICT in organizations and asserted that business communications that are sent electronically (email messages) become official records, subject to statutory record keeping requirements; and such must not be inappropriately deleted. From the account Borg (n.d.), apart from using ICT and computer equipment in primary schools to teach the rest of the curriculum in an efficient way; to present content in an entertaining way; to offer children better opportunities for self-expression; to familiarize children with a tool which is constantly imposing itself as a major part of their everyday life, ICT equally enhances record keeping. Records such as certificates, prize lists, scores, minutes are kept via ICT to enable the teachers monitor and keep track of developments in children. It also facilitates the teachers' ability to have a clear snapshot of the individual child's continuous development of skills, character and personality.

ICT is equally made for effective measuring, monitoring and recording progress (Borg. n.d). Keakope (2003) reported that the adoption of ICT in government has helped services performance and work done in proximity. Public officers can create, store, retrieve and disseminate information with ease; more records are now produced and kept in electronic form. With this development, management, administrative functions in the government such as in personnel, electrical process, land registration, payroll, auditing and accounting are now done without pressure. Also with record keeping through ICT, Keakope (2003) pointed out that decision-making and accountability are made possible as they continue to provide evidence of transactions in the organization. According to Rhodes

(2009), China developed Chinese software to boost the governments' record keeping. This according to Rhodes ensured a risk free record and archival system for the office of the prime minister and the country's public service.

The literature on use of ICT for data preservation reviewed so far revealed that many researchers found that use of ICT is significantly relevant in data preservation. However, many of the studies were done in the foreign countries of the world, while a few were found in Nigeria and Akwa Ibom State in particular. Besides, many of those literatures found were from the study of other parasatals like companies, hospitals among others, hence the study of the use of ICT for data preservation by school administrators in Akwa Ibom State. The findings in this study would increase the available literature on the subject matter, especially in the study area, which is Akwa Ibom State.

ICT in schools management has been elusive since most of the school management are either computer illiterate or technology ignorant, but the current global technological changes requires modernization and digitalization of almost every sector, be it educational or business. Notes that despite the apparent benefits of the use of ICT for educational purposes, studies showed that in many cases, the learning potential of ICT is deprived as many educational administrators are still not fully ICT literate and do not use it in the school management and teaching. It is with this background that the study aims at studying ICT in enhancing its effective use in secondary school management.

In today's world, ICT can increase school effectiveness and reduce unnecessary bureaucracy in school administration. With ICT, the secondary school administrators can discharge their duties by using computers and Internet in solving school general problems and in carrying out their day-to-day assignment especially as it relates to having a reliable information system in a laptop computer. ICT can play a major part in diminishing the work load of the administrative staffs especially in keeping daily records of students, in analyzing students' attendance records, and in marking students' scripts and recording results. Through this, much time is saved and utilized in other directions for effective school administration. Despite the above roles, ICT can play for the school administrator, one wonders is to know if ICT being used effectively in school administrative processes in the Government Bilingual High School Etou-Ebe secondary schools.

It is assumed that if government policy has been implemented, administrators, teachers, and students in school system must have acquired ICT skills which will help them for effective instructional delivery, facilitation of teaching and learning as well as

acquisition and use is an important aspect of teaching and learning process. The researchers are also of the view that this will be a means for effective administration of schools to meet the challenges of the 21st century. Therefore, the purpose of this study is to determine the roles ICT can play in the administration of secondary schools and extent of its application in secondary school administration.

### **I.1 Background of the Study**

The in-cooperation of Information Communication Technology in secondary school's administrative procedures has positive effects. These may include improvement of the school standards in terms of academics, financial status and in co-curricular activities. Information and Communication Technologies (ICT) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer, and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. When such technologies are used for school administrative purposes, namely to support and improve School Administration, ICT can be considered as a sub field of Educational Technology (Kumar, 2008).

The potential of information communications technology (ICT) in enhancing human capabilities and revolutionizing the management of organizations was first realized in other sectors of human society, mostly in the business world and the military, other than in education (Ray and Davis, 1991). The importance of ICT contribution is also widely recognized both in the workplace and at home (Dawes, 2001; Preston et al. 2000). These examples are just a few pointers which shows that ICT is already a vital enabling tool that can no longer be ignored in the administration of schools. Computers made their earliest manifestation in some African schools in North Africa at the end of the 1960s. This was mainly for management applications (Clark and Mayer, 2003). It was only in the 1970s that they were used in educational institutions in North America and Europe. In Africa, the first computers arrived in educational institutions at the end of the 1970s. States authorities at this time were apparently motivated by a dual goal which were: to initiate students to the computer and to introduce certain software programs.

For the *Time Magazine* (1982), the introduction of computer courses in Africa were offered only in a few elite schools and some universities. Information and communication technologies were largely ignored and instead computer processing was considered a requisite discipline. This urgency was particularly felt in Africa and in January 1982 *Time*

*Magazine* acknowledged the importance of the computer by naming it “Man of the Year”, this was the first time a machine was honored (Time Magazine, 1982). While various researches (Guma et al., 2013; Williams et al., 2001; Watson, 2001) have investigated the roles ICT plays in making teaching and learning process effective in higher institutions of learning as well as the problems faced in successful integration, quite few researches have been carried out to investigate the roles of ICT and its application in higher educational administration. One of the principle factors for smooth running and achievement of institutional goals is effective and realistic administration. Administration is a process of planning activities and utilizing human and imperial resources with an aim of accomplishing goals and objectives of a particular organization or institution. It calls for the ability of the administrators to make the right decisions at the right time to fulfill the predetermined goals. In educational institutional setting therefore, administration has been extended as a service activity or tool through which the fundamental objectives of the institutional process may be optimized more efficiently when allocating human and material resources as well as making the best use of existing resources (Opara and Onyije, 2014).

Hence within educational administration, ICT is implemented for the development of electronic applications, for the management of administrative transactions and records, as well as for the rendering of well-organized and prompt information services (i.e., electronic register, electronic curriculum, digital lesson material, electronic monitoring of school progress). By the early 1980s, computer-assisted learning (CAL) came into existence, and in the mid-1990s, ICT was being applied in a variety of disciplines. Since the late 1990s, the integration of ICT in school administration appears to be on the ascendant in educational circles (EPZ, 2005). The development of ICT in Cameroon has been influenced by the global tendency. Hence there is an increase in the technology in the country. This is evident in terms of number of fixed and mobile telephone lines; the number of computers and services; Internet Service Providers (ISPs), the number of Internet users; broadcasting stations; and market share of each one of them. Due to the prevailing business climate and economic growth, Cameroon has witnessed rapid growth in ICT sector in the recent past. The rapid growth of ICT has also influenced the rapid introduction of computer application in secondary School Administration.

Developed countries are rich in information and as such can quickly adapt to changing social and economic environments, and subsequently can find opportunities to overcome social and economic challenges such as poverty and lack of adequate infrastructure. The

absence of the right policy environment for ICT development in less developed countries including Cameroon has resulted in the widening of the development and information gap between developed and underdeveloped countries, as well as between urban and rural communities in developing countries. Information and Communication Technology is not an end in itself for Cameroon, but a powerful tool to help increase productivity, competitiveness, stimulate growth, create employment opportunities and as such improve the wellbeing of Cameroonians. Cameroon intends to use ICTs to build a people-centered, inclusive and development-oriented information society, where its citizens can create, access, utilize and share information and knowledge in a bid to achieve sustainable social and economic growth, which is one of the preconditions for poverty reduction and hence improvement of the quality of life of Cameroonians.

Consequently, the President of the Republic, H.E. Paul Biya, strongly emphasized on November 30, 2002, that the effective emergence of an information society in Cameroon would help “strengthen unity between our peoples and combat inequalities by granting access to information and knowledge to most Cameroonians...” and, thus, “make the country better placed to enter the third millennium”. He has repeatedly invited Cameroonians of all works of life to adopt and use ICTs in their daily activities in an effort to combat poverty and exclusion from the information society. It is in this light that he set the tone in his November 3, 2004 speech, when he stated inter alia, “our country needs generalized Internet access”. There have been several national initiatives aimed at stimulating the use of ICTs, as development tool to alleviate poverty and other challenging issues. These include:

- identification of ICTs as an enabler in achieving most of the activities identified in the Poverty Reduction Strategy Paper (PRSP) in 2003;
- formulation of a sectorial strategy in the field of telecommunications and ICTs by the Ministry of Posts and Telecommunications in 2005.

Alongside these activities, several initiatives for the development and deployment of ICTs are underway within government departments in Cameroon. These include:

- the formulation of a government action plan for an information and knowledge based society by the Ministry of Scientific Research and innovation;
- the implementation of an ICT development program by the Ministry of Higher Education;
- the creation of multimedia resource centers in secondary and high schools within the Ministry of Secondary Education;

- the implementation of the audiovisual sector liberalization option by the Ministry of Communication;
- the implementation of the National Governance Program by the Prime Minister's Office;
- the introduction of ICTs in the management of State personnel by the Ministry of the Public Service and Administrative Reform;
- the computerization of the national identity card by the Delegation of National Security;
- the computerization of the electoral process by the Ministry of Territorial Administration and Decentralization.

These national initiatives are supported by other external initiatives, such as:

- the initiative of the Economic Commission for Africa (ECA) on defining the National Information and Communication Plan (NICI Plan);
- the UNDP initiative on an ICT policy in Cameroon within the framework of the Second Tokyo International Conference for African Development (TICAD II) ;
- the International Telecommunications Union (ITU) support to the formulation of MINPOSTEL sector strategy;
- support to the development of community and rural radios by UNESCO.

Despite the positive impacts of these initiatives, the absence of broad-based consultation and coordination among various stakeholders during the formulation of these sectorial strategies and programs of Ministries resulted in incoherent visions of the development of the ICT sector. These shortcomings prompted the development of a National ICT policy which reflects a single and coherent vision on ICT development that takes into account the convergence in technologies. This policy is intended to implement some provisions of the Constitution, the Investment Code, education sector laws, major guidelines of the PRSP and honor commitments made by Cameroon with regards to global poverty reduction efforts (Millennium Development Goals, Education for all, Tunis Agenda for the Information Society, etc.).

These strategies takes into account the government's desire to make the ICT sector a major player in promoting active and responsible citizenship. This objective is a prerequisite for the implementation of a vast ICT sector development program. Only through such a program can any financial support, whether national or foreign, yield investment returns and hence induce economic development of the society. To achieve this ideal, an effective

participation in the global economy requires that, countries should be connected onto the information superhighway in a bid to make information available to individuals, corporate bodies, communities and the nation at large, about any available opportunities worldwide, thereby increasing the chances of improving the quality of lives of their citizens.

Education encompasses teaching and learning specific skills, and also something less tangible but more intense: the imparting of knowledge, positive judgment and well-developed wisdom (Alexis, 2003). Education has as one of its main objectives, the imparting of culture from generation to generation. School administration plays a vital role in ensuring that education is passed to the students as recommended.

It is also the duty of the school administration to monitor the enrollment of students in the school, availability of educational resources, human labor and availability of finance to sustain the daily activities of the school (Meador, 2011). Alex (2003) argues that schools administrations had to monitor all these records of the school activities by entering the details manually on the books and records of the schools. But with the introduction of ICT in Cameroon, there are various programs that come in handy to minimize the efforts put by the administration in monitoring and managing the school activities. These programs help the administration to monitor their daily activities in the school by a click on button. Today, the applications of ICT in School Administration and education are numerous, yet it is not effective in most Cameroonian secondary schools. Thus, this study sought to find out the use of ICT and effective administrative processes in Cameroon secondary schools with respect to the case of Government Bilingual Secondary School Etoug-Ebe Yaoundé.

## **I.2. Statement of the Problem**

A research problem is a statement about an area of concern, a condition to be improved upon, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that point to the need for meaningful understanding and deliberate investigation.

The problem of this study is to show the effectiveness of ICTs within a school, especially in administrative management. Thus, the possession of a computer is an asset in the management of the confection of administrative data within a school environment. In this context, the knowledge of computer tool becomes an essential factor for the administrative staff. This is what will lead to know the level of usage of ICT in administrative procedures in schools.



The use of ICT in school administrative processes cannot be over emphasized because of the following reasons. Computers help to generate reports automatically and to a common format to both the teaching and administrative staff. It can be used equally to monitor students' academic and behavioral progress. As stated in the work of Molindo A.E. (2007), shows that computer assisted counseling exists in terms of the secrecy and confidence that is required for an individual to reveal feelings, problems or emotions. Also, computer could be of help for curriculum planning. This can be possible in the sense that teachers can use the internet to gather resources useful to them during their teaching exercise. Also, since the advent of ICTs, several schools in Cameroon have benefited from computer tools. But some of the school authorities still decide not to make good use of these ICT tools to facilitate their duties.

We still find them performing their duties manually. In this light, despite the numerous efforts made by the state to promote ICT in schools, it is observed that there are still some school authorities who do not want to ameliorate the way they perform their duties. Generally, the reasons that motivate school authorities to integrate ICTs in their institutions are the exploration of new horizons, the use of new educational opportunities and especially the improvement of the management of schools. Taken into consideration all these facts, can we say that ICTs contribute efficiently in the administrative processes of an institution? We are interested in knowing the place of this new technology in Cameroon public secondary schools, precisely in administrative procedures. How effective has ICT being in the administrative procedures of an institution with respect to Government Bilingual High School Etoug-Ebe Yaoundé?

### **I.3. Research Questions**

The questions that a research seeks to answer when the research terminates are termed research questions. The nature and quality of research questions determine the quality of the research in general. Maxwell (2005:4) view a research question as describing precisely what the researcher want to understand in the study and projects questions the study intends to answer and how the questions relate to the other.

#### **I.3.1. General research question**

The research question for this work seeks to know what level of ICT is in the management of administrative procedures in a secondary school?

### **I.3.2. Specific research questions**

We shall be going through this study with the following questions in mind:

- ❖ Can the effectiveness of ICT be useful in the preparation of pedagogical documents in school administration?
- ❖ Will there be any amelioration for the effectiveness of ICT is used to ensure discipline in school administration?
- ❖ Are there better facilities in the effectiveness of ICT application in the follow up of teachers in school administration?
- ❖ Is the effectiveness of ICT helpful in keeping records of staffs in school administration?

### **I.4. Purpose of the Study**

Information communication technology skills play a major role in promoting the economy of a country. Many of the productivity gains in the developed economies over the past two decades can, to a greater extent, be attributed to the impact of ICT. The government appreciates and recognizes that, an ICT literate work force is the foundation on which Cameroon can acquire the status of a knowledge economy and specially that of education. The study intended to examine the use of ICT and the effectiveness in school administrative processes as the case of Government Bilingual High School Etoug-Ebe Yaoundé. Further, the study sought to identify the challenges and the measures that could be taken to improve its application.

### **I.5. Objectives of the Study**

This study has as main objective to evaluate the effectiveness of ICT in the management of administrative procedures in the school milieu.

According to Varkevisser, Pathmanathan and Brownlee (2003:84) regard research objectives as a resume of what the research intends to achieve and it should be closely tied to problem statement. They propose that there should be a general objective that describes what the researcher expects to achieve in the study in general terms but this should be broken down into smaller, logically and connected parts referred to as specific objectives.

#### **I.5.1. General objective of the Study**

This study is inscribed on the management of administrative procedures on campus with the aide of modern technologies. Although these modern technologies are not new in themselves, but how effective do administrators make use of them at their various level of

occupation. This is the case of the effectiveness of ICT in the management of school administrative procedures. We shall be evaluating the extend of the effectiveness of ICT in the management of administrative procedures in the school milieu.

### **I.5.2. Specific objectives of the Study**

We shall be dueling on the following specific objectives:

- Assess the potentials of the effectiveness of ICT useful in the preparation of pedagogic documents of school administration in public secondary schools like that of Government Bilingual High School Etoug-Ebe.
- Evaluate the effectiveness of ICT application in discipline of school administration.
- Come out with the possible logistic requirements for the effectiveness of ICT usage in the follow up of teachers of school administration.
- Find out the extent to which the effectiveness of ICT is helpful in keeping records of staffs of school administration.

## **I.6. Hypotheses of the study**

### **I.6.1. General hypothese of the study**

From a general observation according to this work, this study has as general hypothesis the fact that: effectiveness of ICT ameliorates administrative processes of secondary schools.

### **I.6.2. Specific hypotheses of the study**

In the frame work of this study, we consider putting in relief a certain number of specific hypotheses judiciously:

- Effectiveness of ICT permits the preparation of pedagogical duties like school time table, lessons sheet progressions, school calendar activities and marks management processes in school administration;
- Effectiveness of ICT assists the discipline department to better organize discipline in school administration;
- Effectiveness of ICT facilitates the follow up of teachers in their lessons preparation and conceiving evaluation questions in school administration;
- Effectiveness of ICT helps to keep records of staff in school administration.

### **I.7. Significance of the study**

The work was projected to be of significance to a number of stakeholders in education. These include School Management, Policy Makers, and teachers. In the present day, ICT application remains a fundamental component in administration of any institute. Schools are such organizations that require this very component. The result of this work are hoped to be of benefit to school management in terms of flaking more light on the various areas that school managers can be effective as they exercise their duties while using ICT. These include instructional leadership, management of school facilities, and teaching and learning resources.

The findings will be of significance to the policy makers. The measures on improving the application of ICT is hoped to form ground for policy makers to come up with new ICT policy design and implementation strategies to be used in the public administration of schools. Moreover teachers, students and other members of school community may also benefit if only the recommendations of the study are considered. Application of ICT in administration can bring about renewed dynamism in terms of enhancing decision making processes, communication process and ultimately, the overall performance. Likewise, the findings of the study is also hoped to arouse interest to scholars and researchers who may embark on conducting further research on the Application of ICT in administration that had been previously given only a little considerations.

### **I.8. Delimitation of the Study**

The study focused on the effectiveness of ICT usage in school administrative processes: the case of Government Bilingual High School Etoug Ebe. Other areas where the study covered include the challenges facing the application of ICT in School administration and the measures that can be put in place to improve the application of ICT in school Administration. The administrators and teachers were the key informants since they are directly involved with the day to day school administration and use of ICT. Students were also part of the study since they constituted a major component of school administration.

### **I.9. Plan of the Study**

Conscious of the place that ICT occupies for the improvement of administrative processes, the application of this ICT in school milieu has comes to answer the requirements for quality educative system and administrative modernization. Yet, an education of quality owes its dynamism to the effort made by its staff as a set and to the

quality of the services rendered by each of the teams (personal of direction, personal of teaching) at their various levels. Also, seen the increasing importance of the digital world on the socio-professional plan and its presence in nearly all sectors of activity (security, health, education, etc.), it appears important to carry out a study on the effectiveness of ICT in the management of school administrative procedures.

To this effect, to make use of the rational collected information, this work is subdivided specifically, into four chapters:

- the first chapter presents the conceptual and theoretical framework: application of ICT in school institutions;
- the second chapter is about the literature review;
- the third chapter retraces the methods and techniques involved in ICT in the educational field;
- and the fourth chapter analyzes the ICT effectiveness in the administrative procedures of the establishment.

# CHAPTER 1: CONCEPTUAL AND THEORETICAL FRAMEWORK IN SCHOOL INSTITUTIONS APPLICATION OF ICT

## INTRODUCTION

This chapter presents detailed information on the conceptual and theoretical framework on one hand and literature review on the application of ICT and effective administrative processes in school environment. The chapter is divided into the following: conceptual and theoretical frameworks with subtitles like definition of concepts and certain theoretical models and literature review with subtitles like Concepts of ICT and its effectiveness, Use and effectiveness of ICT in the management of schools, the use of ICT by administrative staff, the use of ICT by teachers and challenges of ICT integration in school administration.

## II.1. CONCEPTUAL FRAMEWORK

The introduction or integration of ICTs in the educational environment is a complex issue with several factors, hence the need to use theoretical models that can serve as a blueprint for the integration process in all its dimensions. Thus, the aim is to show the usefulness of theoretical models in the process of integrating ICT in education. Therefore, the definition of certain concepts is important before presenting some of the models that each has contributed to the emergence of ICT through their theoretical bases and their application in the various educational environments.

### II.1.1. Information and Communication Technologies (ICT) in Education

#### II.1.1.1. Nature and definition

The concepts of information and communication technologies (ICTs) and new information and communication technologies (NICTs) bring together the techniques used in the processing and transmission of information, mainly computer, internet and telecommunications. By extension, they also refer to the economic activity sector of information and communication technologies. The concept of "information and communication technologies" has two characteristics that are typical of new notions: while it is frequently mentioned in contemporary debates, its semantic definition remains unclear. We can also observe that in this expression the term technology, which in all rigor

means discourse on the technique, is used in place of technique that would be both simpler and more accurate.

New Information and Communication Technologies (NICT) refers to ICTs that has just been invented. The first steps towards an information society were started with the invention of the electric telegraph, the fixed telephone, the radiotelephone and, finally, the television. The Internet, mobile telecommunication and GPS can be considered as NICTs. The rapprochement between IT and telecoms dates from the last decade of the twentieth century; Miniaturized "multifunctional" devices are on the market in 2005-2006 (monitoring of television programs on mobile phones). This concept of NICT was created on the initiative of many network engineers who, following the evolution of network technologies, thought it necessary to distinguish these technologies from the old ones. However, no delineation exists between ICT and NICTs and therefore one can legitimately wonder when an ICT becomes old. This leads to a trend, that is the disappearance of this term.

In the different literatures it is noted that there is no consensus on the definition of ICT given their heterogeneities and complexities. Indeed, we can distinguish according to the authors the following definitions:

Herbert Simon (Nobel Prize in Economics 1998). According to this author these technologies help to make: "All information accessible to men, in verbal or symbolic form, also in computer readable form, books and memories will be stored in electronic memories ..." Thus, information technologies and communication technologies can be defined as: "All IT and telecommunication technologies are the result of a convergence of technologies, they allow the exchange of information and their processing, and they also offer new means of communication. and methods of communication ".

Carpenter: "ICTs are a set of technologies used to process, modify and exchange information, more specifically digitized data. The birth of these ICTs is due to the convergence of three activities. In the strict sense, ICTs are composed of:

- telecommunications, which includes services and equipment itself;
- the IT field which includes hardware, services and software;
- the audiovisual field, which mainly includes audiovisual production and services as well as consumer electronics. "

As for the OECD, its definition is a bit broader since it also includes wholesale trade in industrial equipment. The principle is to retain all sectors of economic activity that

contribute to the visualization, processing, storage and transmission of information by electronic means.

"ICT" is a notion often limited to the empirical description of technical objects and their characteristics (Peraya, 1998). The term includes three concepts: one of technology, the other of communication and another of information (Basque, 2005). In training, ICTs build tools for building knowledge and skills for learners, reflexivity and professional development for teachers, promotion and innovation in institutions (Rabardel and Folcher, 2004). They change the practices, the research strategies of experimentation, the publication of the one who appropriates them, and the knowledge becomes a matter of exchange (Karsenti, 2007). In this study, we adopt the definition of Peraya and Peltier (2012) who consider that "technologies constitute both a teaching content and learning environments in which learners can build and produce knowledge about these same technologies but also collaborate, interact, etc. "

In education, ICTs refer to a set of technologies based on computer science, microelectronics, telecommunications, multimedia and audiovisual, which combine and interconnect (Karsenti, 2009):

- enable the search, storage, processing, transmission of information in the form of data of various types (text, sound, image, video, etc.) and interactivity between people and between people and machines;
- provide access to information;
- facilitate and enable the sharing and dissemination of information;
- Support pedagogical strategies.

Furthermore, ICT is technology-based and knowledge-driven and is indispensable in the present age. Vernon (2001) stated that ICT is a collective term covering all those technologies, hardware and software, dedicated to the capture, storage, and processing, transmission, and presentation of information. The use of ICT in all spheres of human activities has changed the face of the earth. It is used in the health services delivery, engineering, industry, business and agriculture, military, security, law, politics, and governance, all aspects of arts, science and education among others. According to Hawkrige, Jaworski and McMahon (2011), computers are at the heart of the ICT revolution because they are fast information processing machines, configured to receive input in the form of information, systematically process the input and provide organized



information that serves the needs of the user. It has the advantage of improving administrative efficiency and overall quality of the teaching and learning process.

Information and Communication Technologies for Education (ICTE) covers digital tools and products that can be used in education and teaching. Therefore ICTE is a combination of ICT coupled with Education.

ICTE are a collection of tools designed and used to produce, process, store, exchange, categorize, retrieve and read digital documents for teaching and learning purposes.

A part from this introduction to computers, tools which are now indispensable to users, whose usage requires both technical familiarization and intellectual training, ICTs also represent an important potential for educational innovations and an almost infinite reservoir of new practices for both teachers and the entire education system.

To better understand the representation of ICTE, there are six families of resources that it offers:

- General software (text, sound and / or digital images) used for teaching or learning purposes;
- Banks of data and information (digital documents: texts, images, videos ...) that can be used as teaching aids and illustrations by the teacher or that can serve as a source of information not only to students during documentary research but equally by administrative staff;
- Digital manuals enriched with new data (videos ) and a single navigation tool;
- Personal work tools (exercisers, personal laboratories) able to adapt to the level of the learners, their objectives and their courses;
- Simulators, expert systems, to model the phenomena studied and to vary their parameters;
- Collective work, networking and communication devices.

#### **II.1.1.2. Pedagogical practices favored by ICT**

For the technologies to contribute to the development of pedagogies, Lebrun believes that "they should be framed by pedagogical devices based on more incentive and interactive methods, supported by new roles of the actors, teachers and students, and finalized in the development of human, social and professional skills of these actors "(Lebrun, 2011). Pedagogies include: goals that are the skills the learner needs to develop,

learner-centered methods, and assessments that allow the learner to show what he or she can do. Certain pedagogical conditions favor the success of learning with ICTs such as intentionality, project work, interdisciplinarity and the organization and structuring of knowledge (Tardif, 1996). Similarly, so-called "active" practices concern, among other things, problem-solving learning, case analysis, cooperative learning, project-based learning. They lead the student to search for himself, select resources, interact and understand problem situations close to his everyday life and his professional life. Knowledge is built by collaborating with others, the "Learner-Teacher" and "Learner-Learner" interactions are privileged, the teacher intervenes to guide and disseminate feedback on the work.

### **II.1.2. Management**

Management is a set of administrative practices aimed at mobilizing and developing human and physical resources for greater efficiency and effectiveness in the organization of schools (Blanche Vangi Kwali, 2009). It is an activity that should aim at improving transversal communication, while respecting the organizational chart of the school. According to Bernard Gazier, Human Resources Management has evolved since the time when the function was called Administration personnel. It is no longer a question of administering but of managing human capital.

### **II.1.3. Effectiveness**

Effectiveness is the ability to plan, organize and coordinate many and often-conflicting social energies in a single organization so adroitly (Adams 1963). It implies that, it is the right and duties attached to an individual irrespective of the gender of the incumbent. Effectiveness is equivalent to achievement muted by incumbent administrator or principal of secondary school. It could be identified as a plan proposed in advance and accomplished later but within a stipulated time or duration of school. Effectiveness is a part of function assumed by someone, a set of specific responsibilities, assumed by a professional in a setting (Ipaya 1996)

The degree to which objectives are achieved and the extent to which targeted problems are solved. In contrast to efficiency, effectiveness is determined without reference to costs and, whereas efficiency means "doing the thing right," effectiveness means "doing the right thing."

The implication is that when a principal maintains high morale discipline and decorum among his staff and also students, he exhibits a personality of effectiveness worthy of emulation. Uche (2002) identified effectiveness in a series of his studies related to effectiveness, that it is a symbol of good administrative style of the incumbent, team work, morale or motivation of staff, good teaching conducive social climate and counseling as well as rules and regulations. The principal's ability to control and maintain school facilities, initiates projects and completes both the new ones and also those abandoned by his predecessor(s) is exemplary of effectiveness. Equally, monitoring performance regular staff meeting, interaction, encouraging staff participation in decision-making is an evident of effectiveness but when the principal is all-wise, seems more knowledgeable, there is bound to be a disparity in the school at such, the staff may not be productive.

Ipaya (1996) sees administrative effectiveness as part of the function assumed by someone with a set of specific responsibilities. He went further to mention that efficiency and effectiveness can be achieved in the school system, if the principal who is the administrator is tactful in dealing with his/her subordinates and the community in which the school is situated. Uche (2002) confirms that administrative effectiveness is a symbol of a good administrative style on the part of the school principal, team work, moral of teachers, good teaching, conducive social climate, proper guidance and counseling as well as rules and regulations. He opines that another aspect of administrative effectiveness is the ability of the principal to conduct an orientation for new staff posted to his/her school and also new students who arrive at the school for the first time so that they can adjust themselves quickly and readily in the new environment. Bernard (1993) describes administrative effectiveness as relating to the accomplishment of the co-operative purpose, which is social and non-personnel in character. He contends that the first step towards effectiveness is the integration of individuals to participate within the organization. He referred to the concept of effectiveness as the degree of success in the organization. It is the measure of concordance of the roles of behaviours and the role of expectation of the role incumbent as conserved by Getzels and Cuba (1954). Bernard (1993) further affirms that organizational effectiveness is the extent to which the individual needs of its members are satisfied.

Belenardo (2001) adds that administrative effectiveness is characterized by high scores on both initiating and task structure by planning, and the extent to which the principal, as an effective administrator is able to define and organize the duties of staff and student at

each particular time. Administrative effectiveness simply put, means the attainment of organizational goals and objectives through cooperative human effort.

#### **II.1.4. Procedure**

A procedure is an imposed succession of tasks to be performed. It generally responds to requirements that are not questionable by the operator who applies them, for example, a safety procedure or an administrative procedure (Henry A. and Monkam-Daverat I., 2001).

A procedure in the field of administration and business designates a specified manner of performing a set of tasks. It represents the implementation of all or part of a process and is intended to be reproducible. It describes step by step the sequence of tasks to be carried out and the roles and responsibilities associated with them. An administrative procedure is a procedure that systematizes the organization and policy of an administration in order to achieve some of the objectives of that administration. The business process can be a result of process modeling or business process reengineering.

#### **II.1.5. Administrative procedure**

Administrative procedure is the formal way of the acts through which the administrative action takes place to accomplish an end. The purpose is the issuance of an administrative act. The obligation to obey strict legal channels ensuring the guarantee of citizens distinguishes public action from private activity. This guarantee is given by the legal order and by the assurance of knowing that the information can be known and taxed by all persons. Thus, the administrative procedure is in a sense the guarantor of administrative action, which can not be arbitrary or discretionary since it must imperatively respect the rules of procedure (Bovay B eno t, 2015).

Administrative procedure encompasses four main principles: the principle of unity, the principle of contradiction, the principle of impartiality and the principle of officiality. The principle of unity holds that the procedure is a single process that has a beginning and an end (it must be resolved in any form).

According to the principle of contradiction, the resolution of the proceedings is based on the facts and the legal basis, following the verification of the facts and the evidence.

The principle of impartiality ensures that the action will proceed without favoritism or

enmity. Officials must abstain if they have a personal interest in the matter, a kinship or friendship / enmity, or if they are part of the witnesses.

Finally, the principle of officiality obliges the procedure to be developed automatically during all the proceedings.

#### **II.1.6. Administration**

**Administration:** The formalized system which is intended to control, supervise, plan and make decisions about various activities of the organization on the basis of established authority.

#### **II.1.7. School Administrators**

**School Administrators:** This term has been used to refer to those who are involved in day to day administration of schools. For example PTA chairman, principals, Vice principals, Discipline masters and H.O.D, among others.

### **II.2. CERTAIN THEORETICAL MODELS**

There are several theoretical models of which the most popular are: The Open System, The TPACK, The SAMR, The PST and The Continuum of Approaches.

#### **II.2.1. The Open System**

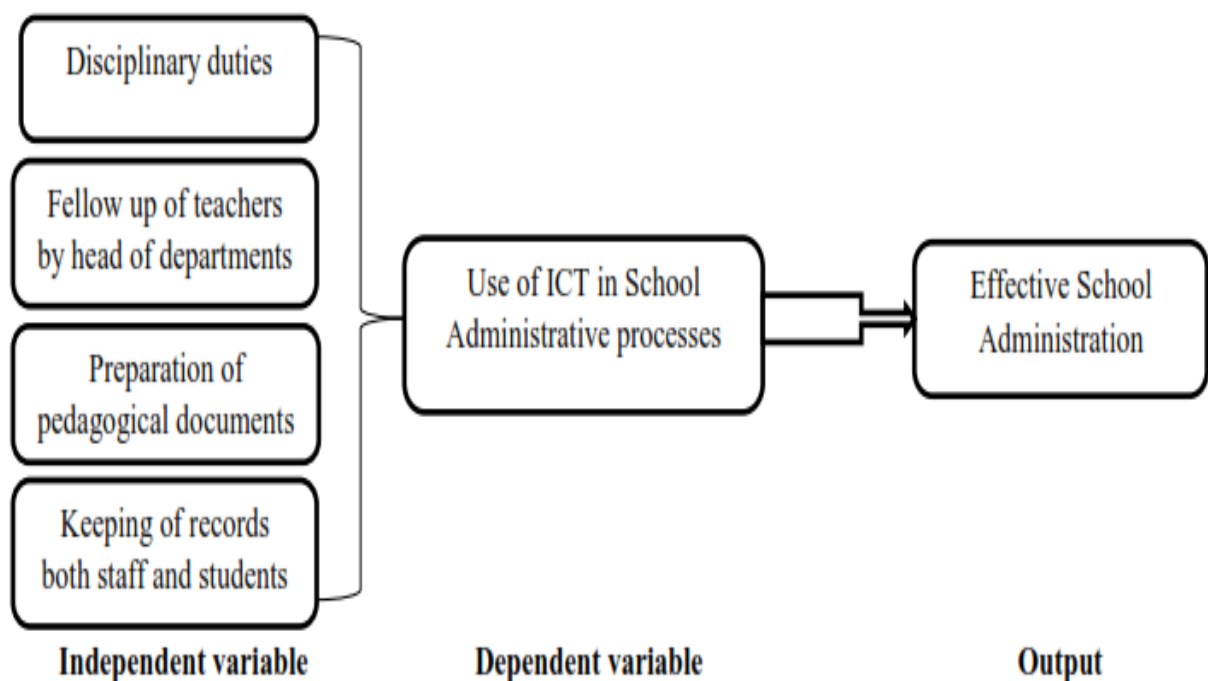
The Open systems theory can be defined as the concept that organizations are strongly influenced by their environment. The environment consists of other organizations that exert various forces of an economic, political, or social nature. The environment also provides key resources that sustain the organization and lead to change and survival. Open systems theory was developed after World War II in reaction to earlier theories of organizations, such as the human relations perspective of Elton Mayo and the administrative theories of Henri Fayol, which treated the organization largely as a self-contained entity.

Practically all modern theories of organization utilize the open systems perspective. As a result, open systems theories come in many flavors. For example, contingency theorists argue that organizations are organized in ways that best fit the environment in which they are embedded. Institutional theorists see organizations as a means by which the societal values and beliefs are embedded in organizational structure and expressed in organizational change. Resource dependency theorists perceive the organization as adapting to the environment as dictated by its resource providers. Although there is a great

variety in the perspectives provided by open systems theories, they share the perspective that an organization’s survival is dependent upon its relationship with the environment. Open systems theory has deeply changed how we appreciate schools as organizations and the anxiety placed upon educational administrators.

Also, looking at schools as if they are autonomous of their environment would lead to wide misperceptions of the dynamic factors behind organizational change. Current studies of accountability movements, teacher professionalization, and instructional leadership all benefit from a strongly open systems approach to understanding environmental demands and the resulting adaptation in school policy and its implementation, or lack thereof. Indeed, today scholars are legally uncertain of work that fails to consider the rich context in which schools develop.

The conceptual framework of this study shows the interaction between the dependent and independent variables. In this study, the use of ICT and the effectiveness in school administrative processes is a dependent variable which relies on the preparation of pedagogical duties, disciplinary duties, fellow up of teachers by head of departments and keeping of records of both staff and students (See Figure 1.1).



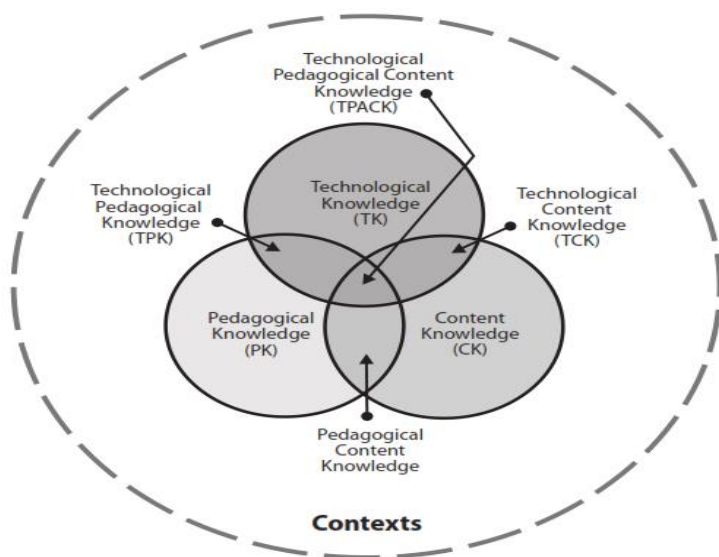
**Figure 1: Use of ICT in School Administrative procedures**

## II.2.2. Overview of TPACK (Technological Pedagogical Content Knowledge) Framework

In the TPACK framework, what teachers need to know is characterized by three broad knowledge, namely; technology, pedagogy, and content and the interactions between and among these knowledge bases. In this approach, technology in teaching is characterized as something well beyond isolated knowledge of specific hardware or software. Rather, technology that is introduced into teaching contexts “causes the representation of new concepts and requires developing sensitivity to the dynamic, transactional relationship between all three components” (Koehler and Mishra, 2005a, p. 134).

The conception of TPACK described here has developed over time and through a series of publications, with the most complete descriptions of the framework found in Mishra and Koehler (2006) and Koehler and Mishra (2008).

In this model (see Figure 1), there are three main components of teachers’ knowledge: content, pedagogy, and technology. Equally important to the model are the interactions between and among these bodies of knowledge, represented as PCK, TCK (technological content knowledge), TPK (technological pedagogical knowledge), and TPACK.



**Figure 2: TPACK Framework (Image from <http://tpack.org>)**

The TPACK framework also emphasizes the role of the context within teaching and learning. Ignoring context leads to “generic solutions to the problem of teaching” (Mishra and Koehler, 2006, p. 1032). Teaching is a context-bound activity, and teachers with developed TPACK use technology to design learning experiences tailored for specific

pedagogies, crafted for specific content, as instantiated in specific learning contexts. In the sections below, we describe each of the components of the TPACK framework and, most importantly, their interactions with each other.

➤ **Technological Knowledge (TK) or Technology Knowledge**

Technology knowledge (TK) is always in a state of flux more so than the other two core knowledge domains in the TPACK framework (pedagogy and content). Thus, defining it is notoriously difficult. Any definition of technology knowledge is in danger of becoming outdated by the time this text has been published. That said, certain ways of thinking about and working with technology can apply to all technology tools and resources.

The definition of TK used in the TPACK framework is close to that of Fluency of Information Technology (FIT), as proposed by the Committee of Information Technology Literacy of the National Research Council (NRC, 1999). They argue that FIT goes beyond traditional notions of computer literacy to require that persons understand information technology broadly enough to apply it productively at work and in their everyday lives, to recognize when information technology can assist or impede the achievement of a goal, and to continually adapt to changes in information technology. FIT, therefore, requires a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving than does the traditional definition of computer literacy. Acquiring TK in this manner enables a person to accomplish a variety of different tasks using information technology and to develop different ways of accomplishing a given task. This conceptualization of TK does not posit an “end state,” but rather sees it developmentally, as evolving over a lifetime of generative, open-ended interaction with technology.

➤ **Pedagogical knowledge (PK)**

Pedagogical knowledge (PK) is teachers’ deep knowledge about the processes and practices or methods of teaching and learning. They encompass, among other things, overall educational purposes, values, and aims. This generic form of knowledge applies to understanding how students learn, general classroom management skills, lesson planning, and student assessment. It includes knowledge about techniques or methods used in the classroom; the nature of the target audience; and strategies for evaluating student



understanding. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills and how they develop a critical mind and positive dispositions toward learning. As such, pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom.

➤ **Content Knowledge (CK)**

Content knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught. The content to be covered in middle school science or history is different from the content to be covered in an undergraduate course on art appreciation or a graduate seminar on astrophysics. Knowledge of content is of critical importance for teachers. As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, as well as established practices and approaches toward developing such knowledge. Knowledge and the nature of inquiry differ greatly between fields, and teachers should understand the deeper knowledge fundamentals of the disciplines in which they teach. In the case of science, for example, this would include knowledge of scientific facts and theories, the scientific method, and evidence-based reasoning. In the case of art appreciation, such knowledge would include knowledge of art history, famous paintings, sculptures, artists and their historical contexts, as well as knowledge of aesthetic and psychological theories for evaluating art.

The cost of not having a comprehensive base of content knowledge can be prohibitive; for example, students can receive incorrect information and develop misconceptions about the content area (National Research Council, 2000; Pfundt, and Duit, 2000). Yet content knowledge, in and of itself, is an ill-structured domain, and as the culture wars (Zimmerman, 2002), the Great Books controversies (Bloom, 1987; Casement, 1997; Levine, 1996), and court battles over the teaching of evolution (Pennock, 2001) demonstrate, issues relating to curriculum content can be areas of significant contention and disagreement.

➤ **Pedagogical Content Knowledge: PCK**

PCK is consistent with and similar to Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman's conceptualization of PCK is the notion of the transformation of the subject matter for

teaching. Specifically, according to Shulman (1986), this transformation occurs as the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students' prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy. An awareness of common misconceptions and ways of looking at them, the importance of forging connections among different content-based ideas, students' prior knowledge, alternative teaching strategies, and the flexibility that comes from exploring alternative ways of looking at the same idea or problem are all essential for effective teaching.

➤ **Knowledge of Content Technology (TCK) or Technological Content Knowledge**

Technology and content knowledge have a deep historical relationship. Progress in fields as diverse as medicine, history, archeology, and physics have coincided with the development of new technologies that afford the representation and manipulation of data in new and fruitful ways. Consider Roentgen's discovery of X-rays or the technique of carbon 14 dating and the influence of these technologies in the fields of medicine and archeology. Consider also how the advent of the digital computer changed the nature of physics and mathematics and placed a greater emphasis on the role of simulation in understanding phenomena. Technological changes have also offered new metaphors for understanding the world. Viewing the heart as a pump, or the brain as an information-processing machine are just some of the ways in which technologies have provided new perspectives for understanding phenomena. These representational and metaphorical connections are not superficial. They often have led to fundamental changes in the natures of the disciplines.

Understanding the impact of technology on the practices and knowledge of a given discipline is critical to developing appropriate technological tools for educational purposes. The choice of technologies affords and constrains the types of content ideas that can be taught. Likewise, certain content decisions can limit the types of technologies that can be used. Technology can constrain the types of possible representations, but also can afford the construction of newer and more varied representations. Furthermore, technological tools can provide more flexibility in navigating across these representations.

TCK, then, is an understanding of the way technology and content influences and constrain one another. Teachers need to master more than the subject matter they teach; they must also have a deep understanding of the way the subject matter (or the kinds of representations that can be constructed) can be changed by the application of particular technologies. Teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps even changes the technology or vice versa.

➤ **Knowledge of Technological Pedagogical Knowledge (TPK) or Technological Pedagogical Knowledge**

TPK is an understanding of how teaching and learning can change when technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. To build TPK, a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed.

For example, consider how whiteboards may be used in classrooms. Because a whiteboard is typically immobile, visible to many, and easily editable, its uses in classrooms are presupposed. Thus, the whiteboard is usually placed at the front of the classroom and is controlled by the teacher. This location imposes a particular physical order in the classroom by determining the placement of tables and chairs and framing the nature of student-teacher interaction, since students often can use it only when called upon by the teacher. However, it would be incorrect to say that there is only one way in which whiteboards can be used. One has only to compare the use of a whiteboard in a brainstorming meeting in an advertising agency setting to see a rather different use of this technology. In such a setting, the whiteboard is not under the purview of a single individual. It can be used by anybody in the group, and it becomes the focal point around which discussion and the negotiation/construction of meaning occurs. An understanding of the affordances of technology and how they can be leveraged differently according to changes in context and purposes is an important part of understanding TPK.

TPK becomes particularly important because most popular software programs are not designed for educational purposes. Software programs such as the Microsoft Office Suite (Word, PowerPoint, Excel, Entourage, and MSN Messenger) are usually designed for

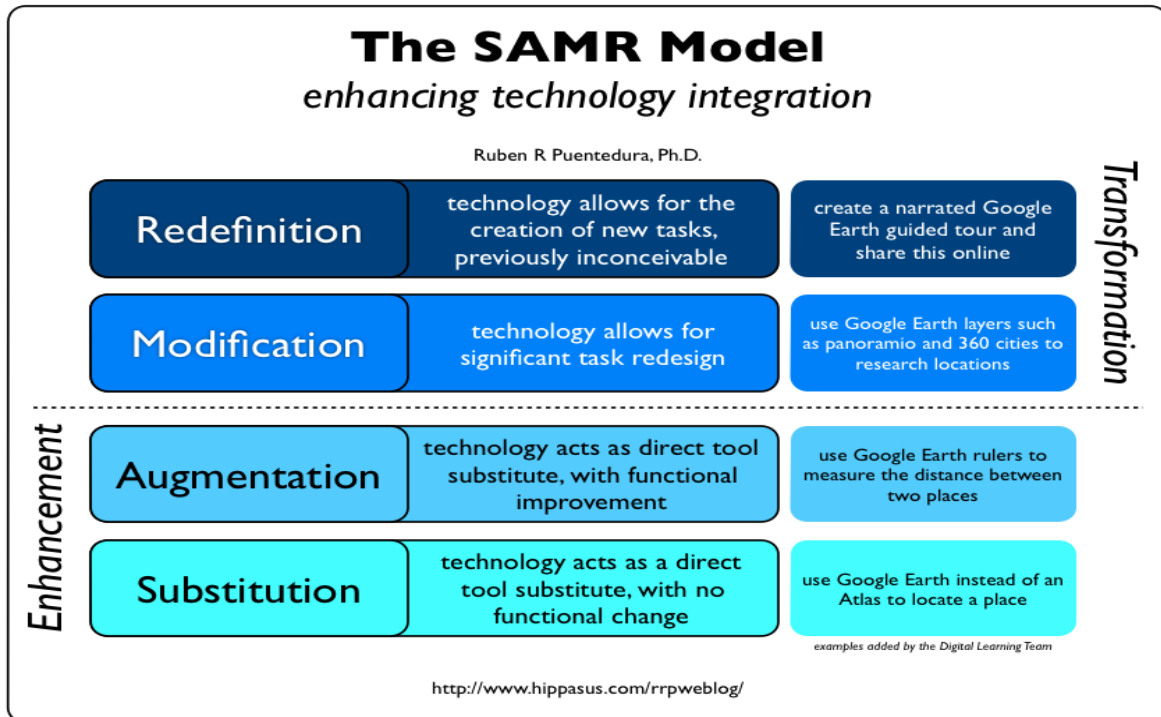
business environments. Web-based technologies such as blogs or podcasts are designed for purposes of entertainment, communication, and social networking. Teachers need to reject functional fixedness (Duncker, 1945) and develop skills to look beyond most common uses for technologies, reconfiguring them for customized pedagogical purposes. Thus, TPK requires a forward-looking, creative, and open-minded seeking of technology use, not for its own sake but for the sake of advancing student learning and understanding.

### **II.2.3. The SAMR model**

The SAMR model is a model representing the integration of ICTs into professional activity and more specifically into education, in four stages or levels which are respectively in increasing order of Substitution, Increase, Modification and Redefinition (where the acronym SAMR). It was conceived and developed between the 80s and 90s by Dr. Ruben R. Puentedura to formally identify the levels of interaction between technology and professional activity in order to improve the efficiency of technology in this interaction. It is broken down into two major phases: growth and transformation.

#### **II.2.3.1. Using SAMR model for ICT integration**

To quote the rationale from BOSTES Science and Technology curriculum, in 21<sup>st</sup> century education teachers are seeking to provide opportunities for students to *'think and act critically and creatively...by becoming technologically literate citizens'*. But what model should teachers use in order to effectively integrate technology across the curriculum? As educators we constantly feel the pressure of including a splash of technology to brighten up our lessons. We have models and structures for higher order thinking, curriculum planning and student wellbeing. But integration of technology is often haphazard and without particular academic rigour. Dr Reuben Puentedura's SAMR model is an excellent tool for directing thoughtful use of technology for teaching and learning.



**Figure 3: the SMAR model**

The SAMR model has four tiers. Each level stands for a letter: **S**ubstitution, **A**ugmentation, **M**odification and **R**edefinition. At the higher levels, the impact of technology is more meaningful. Moving through the continuum, technology facilitates unique learning opportunities that are highly engaging for students. Below each level of the SMAR model has been described.

➤ **Substitution**

At this stage, the technology provides tools to substitute for those commonly used but incorporating the same functionality in another aspect. One example is the substitution of a typewriter (without screen) by a simple text-processing tool (with screen). Here, using the word processing tool there is no functional change (no copying and pasting, no automatic correction, etc.), but a benefit is emphasized which is to be able to perform - even corrections before printing, which is not possible with a typewriter.

➤ **Increase**

At this stage, the technology in addition to be a substitute allows a functional improvement. Referring to the previous example, instead of a simple word processing tool, we can use a more advanced tool integrated in recent computers like word processing software (Ex: Microsoft Word) which allows this time copying or cutting and pasting,

automatic corrections, and so on. These functional improvements promote the productivity of the individual and especially of the pupils (in an educational setting).

➤ **Amendment**

At this level, the technology makes it possible to carry out a profound modification of the task to be accomplished without changing it. For example, we can already talk about inserting graphics, videos or sounds into a document or using animated slides for better transmission and representation of information. The result is an increase in substantial productivity.

➤ **Redefinition**

In this last stage, the technology favors the creation of certain tasks that cannot be performed before without technology. The most important example in education is the ability for students to work or express themselves collaboratively and in real-time through wikis, virtual worlds, forums, and so on. Here, the possibilities for communication and productivity are multiplied tenfold, learning becomes collaborative and integrates a more active participation on the part of the learners.

### **II.2.3.2. SAMR and Bloom's Taxonomy: Assembling the Puzzle**

For teachers just starting out with educational technology, the task at hand can sometimes seem daunting. Even though tools such as the SAMR model can help, the plethora of choices available can prove paralyzing, frequently resulting in ongoing substitutive uses of the technology that block, rather than enable, more ambitious transformative goals.

The approach below is designed to help overcome this barrier, and is inspired in its form by Alexander's notion of Design Patterns a clearly structured solution to a recurring design problem -- which has been applied to education scenarios by Bergin and al. While it is not laid out exactly as a design pattern would be, it nonetheless provides a framework that a teacher could use in similar fashion.

The goal for the teacher is to construct a simple SAMR ladder that is coupled to Bloom's Revised Taxonomy, as the task moves from lower to upper levels of the taxonomy, it also moves from lower to upper levels of SAMR. The two Enhancement levels of SAMR (Substitution, Augmentation) are associated with the three lower levels of

Bloom (Remember, Understand, Apply), while the two Transformation levels of SAMR (Modification, Redefinition) are associated with the upper levels of Bloom (Analyze, Evaluate, Create).

In turn, within each grouping a similar ordering occurs -- e.g., Remember-type tasks are primarily associated with S-level uses of the technology, Understand-type tasks are associated with either S- or A-level uses of the technology, and so on. The following diagram illustrates this association.

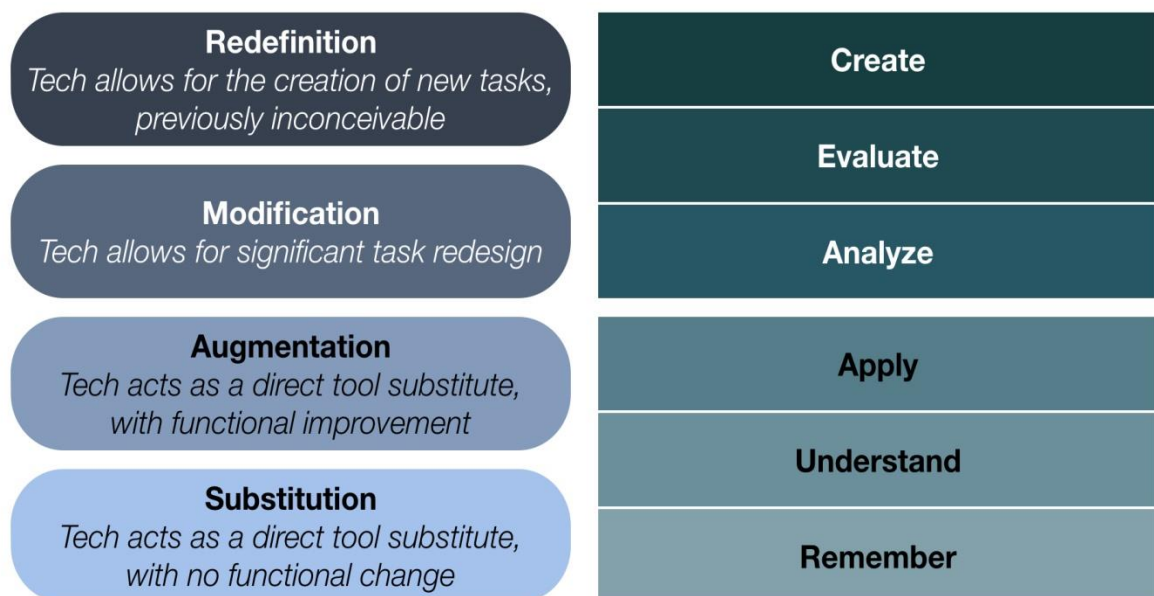


Figure 4: SAMR model and Bloom's Taxonomy

This coupling of the SAMR model and Bloom's Taxonomy has several desirable outcomes:

- The already-familiar drive to reach the upper levels of Bloom's Taxonomy now also acts as a drive to reach the upper levels of SAMR;
- The approach outlines a clear set of steps that help guide the introduction of technology in the classroom;
- Finally, the approach helps avoid pitfalls of self-deception, assuming that a particular task is at a higher level in either the Bloom or SAMR sense than it actually is.

It is important to realize that this association between SAMR and Bloom's Taxonomy is not a necessary or even habitual coupling. Thus, it is possible to use extremely powerful redefinition-level approaches to make certain types of memorization tasks possible;

conversely, it is also possible to undertake novel create-type tasks that only make basic substitution/augmentation use of the technology. Additionally, far more complex couplings between SAMR and Bloom are possible, involving convergent/divergent branchings, oscillations between levels, skipping of some SAMR levels, etc. Nonetheless, the simple structure described above is well suited to beginning practitioners' needs, and even retains usefulness for more experienced faculty.

In addition to the integration of SAMR and Bloom described above, two more ingredients are necessary for the best results:

- a clear motivation for the change, the best results are obtained when a teacher has a strong reason for changing existing practice that is independent of the introduction of technology.

- a clean app flow, designed to move through the tasks, that is as simple as possible, avoiding needless complexity (in transferring work products from one app to the next).

Finally, let's look at an example of this approach in practice. In this example, we will set up a general pattern for math activities, where the motivating factor is to take math instruction from a mode where to use Richard Skemp's words instrumental understanding dominates (how) to a mode where relational understanding is primary (how and why). This shift in math instruction can be seen in changes in curricula worldwide, and is crucial to students' capacity to use -- and enjoy -- the math they have learned in the world outside the classroom. In the interest of making the example more tangible, the context will be a course in introductory statistics, although the general pattern is readily applicable to other math courses.

- **Substitution/Remember:** Students use ebooks and other Open Educational Resources to acquire basic knowledge about statistical tools and procedures.

- **Substitution/Understand:** At the same time, they begin a process of gathering information online describing applications of these statistical tools to an area of interest to them, using simple bookmark aggregation services (Diigo, Delicious) to collect and tag these resources, relating them to the knowledge gained in 1.

- **Augmentation/Apply:** Using a simple yet powerful tool for visualization like GeoGebra, students explore the concepts covered in the resources described in 1., and solve related standard problems. The scope and number of the problems is not governed by



what is available in the “back of the book,” but rather driven by the evolution of student understanding, as measured by suitable formative assessment processes.

➤ **Modification/Analyze:** The students also apply similar problem-solving approaches to questions raised in the materials they found in 2. In doing so, they will reconstruct the reasoning of the original authors, and verify or disprove their conclusions.

➤ **Modification/Evaluate:** Students now select a subset of the materials studied in 4. for further critique and/or development, using GeoGebra as their primary analysis tool. Via a blog, they explain this work to fellow students, and invite their feedback to refine both the clarity of their explanations and the focus of their work.

➤ **Redefinition/Create:** Students refine their blog post into a short digital video project, with the goal that it will be used as part of instructional materials in subsequent years.

#### **II.2.4. The PST model**

PST (Pedagogical, Social and Technological Affordability) is a model for examining and understanding how the affordance of technologies improves learning conditions from the three dimensions: Pedagogical, Social and Technological (PST model). Educational and social affordances are the first to be considered in a teaching-learning situation. However, the affordance of technologies makes it possible to determine to what dimension the social and pedagogical affordances can be implemented. Thus, several social or educational activities cannot be carried out without the use of ICT, such as collaborative work in real time.

➤ **The pedagogical dimension**

The pedagogical dimension here is the pedagogical affordance offered by the learning environment or the use of technologies to achieve the specific objective of learning. For example, if the objective is to evaluate the ability of students to represent their school plan, the learning environment or technology chosen should be able to induce pedagogical affordance to perform very accurate graphic representations.

➤ **The social dimension**

The social dimension represents the social affordability offered by the learning environment or technologies to create a healthy and practical social environment to

facilitate communication between students and between teachers and students. For example, the learning environment can integrate a chat system (visual, audio or text) to facilitate social interaction during learning (Tanyi, M. E. 2016).

➤ **The technological dimension**

In the PST model, technology is the main medium used in the learning environment. The affordance of the learning environment thus depends heavily on the affordance of the technology used. For example, in a discussion-based learning environment, the affordance of wikis, chat rooms, and weblogs solutions effectively contribute to the affordability of the learning environment. Thus, in a mediated learning environment, technological affordance is the pedestal of social and pedagogical affordances.

## **II.2.5. The Continuum of Approaches**

In 2004, a UNESCO paper, based on studies of both the industrialized and the so-called Southern countries, describes a framework for the in-service training of teachers in the use of ICTs. This framework identifies four stages in the schooling of ICT. These four approaches increasingly graduated according to the level of integration of the technologies are called Emergence, Application, Integration and Transformation respectively.

➤ **The Emergence Approach**

At this early stage of ICT integration, schools are equipped with some hardware and software equipment and project their use both in administrative and pedagogical terms. Here, since ICT does not yet intervene in educational practices, the pedagogical methods used within the school are generally teacher-centered. Access to computers by pupils is done only through a few teachers and there are no fixed time slots reserved for this. An introductory program on the uses and benefits of ICTs facilitates access to the sphere of Application of the Continuum.

➤ **The Application Approach**

Here, members of the administration and the teaching profession have become aware of the importance of ICTs in an educational environment and are beginning to use ICTs to carry out their daily tasks thanks to the knowledge acquired during training. In a teaching-learning situation, teachers still occupy a prominent place and remain the

initiators of the use of ICT, for example by distributing their courses in digital format to their pupils. This time, the school plans to have time slots (outside those reserved for each discipline) for access to the computer lab by the students.

➤ **The Integration Approach**

At this stage of development, the school has ICT tools in all its substructures (libraries, classrooms, laboratories, offices, etc.). Teachers change their teaching practices and initiate themselves into research to improve their professional skills through the use of ICTs. In addition to this, through the Internet, for example, curricula are beginning to integrate transdisciplinary work. The context of teaching-learning is then more and more centered on the learner who has the freedom to choose his mode of learning and evaluation. The use of ICTs becomes a discipline in its own right and the establishment easily organizes time slots for ICTs and associates certain disciplines in case of need.

➤ **The Transformation Approach**

This stage is only an extension of the previous one. The institution's operating policy is completely transformed and reflects the use of ICTs in all its aspects: ICTs become an intrinsic factor in the innovation and everyday life of the institution. Students are increasingly responsible for their education. They have unlimited access to ICT resources in the institution. In this way, students participate in the integration of ICTs across the community by seeking solutions to the optimal use of technologies for better communication and representation of information. ICTs are then fully anchored as a discipline in all areas of vocational training. The school becomes a center for ICT studies in the whole community. ICT integration models operate, depending on their types, on administrative and pedagogical aspects of education. However, their adoption is still problematic in most education systems where the contribution of ICTs to the education sector is not fairly measured. The economic constraints of some countries also constitute a bottleneck for the implementation of these models.

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### **II.3. AN APPROACH TO THINKING ABOUT TECHNOLOGICAL INTEGRATION**

Faced with these challenges, how can teachers integrate technology into their teaching? An approach is needed that treats teaching as an interaction between what teachers know and how they apply what they know in the unique circumstances or contexts within their classrooms. There is no “one best way” to integrate technology into curriculum. Rather, integration efforts should be creatively designed or structured for particular subject matter ideas in specific classroom contexts. Honoring the idea that teaching with technology is a complex, ill-structured task, we propose that understanding approaches to successful technology integration requires educators to develop new ways of comprehending and accommodating this complexity.

At the heart of good teaching with technology are three core components: content, pedagogy, and technology, plus the relationships among and between them. The interactions between and among the three components, playing out differently across diverse contexts, account for the wide variations seen in the extent and quality of educational technology integration. These three knowledge bases (content, pedagogy, and technology) form the core of the technology, pedagogy, and content knowledge (TPACK) framework. An overview of the framework is provided in the following section, though more detailed descriptions may be found elsewhere (e.g., Koehler and 2008; Mishra and Koehler, 2006). This perspective is consistent with that of other researchers and approaches that have attempted to extend Shulman’s idea of pedagogical content knowledge (PCK) to include educational technology. (A comprehensive list of such approaches can be found at <http://www.tpck.org/>.)

## **II.4. EDUCATIONAL MANAGEMENT**

Educational management is a field of study and practice concerning the operation of educational organizations as well as the administrative, financial, and bureaucratic responsibilities of school leaders. The role of the headmaster is pluralistic combining its institutional characteristics with the personality of the individual (Durbin, 1998). Effective headmasters' roles, as suggested by Bruggencate et al.(2012, may be performed in several ways concerning behaviors in regard to rational goals, internal process, human relations, and open systems. In this survey the headmasters' responsibilities are classified into five thematic units concerning the vision and culture-orientation of school, teaching and tutoring of students, management and development of educational personnel, bureaucratic dimension of the role of the school leaders as well as their interactions with the parents, the local and wider community, or any other external stakeholders of school.

In the first thematic unit it is indicated that school management is important for defining, transferring, and achieving school objectives (Bamburg and R. Andrews, 1990; Leithwood and al., 1990). Effective headmasters foster a development-oriented school culture through his personality, attitude, and behaviour since the performance orientation enhances the effectiveness. They seek to create an "academic institution" by promoting high expectations and standards for students and teachers (Mortimore, 1993). School is a dynamic interaction of many variables upon which students' chances of success depend (Bruggencate and al., 2012; Reynolds and Teddlie, 2000). In an excellent school, the quality in both learning and administrative proceedings makes it special and unique (Caldwell and J. Spinks, 1992).

The second thematic unit describes the headmaster's supportive role for the entire development of students which is essential for their academic performance since "a better community member will be a better student" (Noddings, 2005). The role of an effective headmaster in managing student population requires good knowledge on both theory and techniques concerning human behaviour (Fullan, 2003). A headmaster should ensure positive school atmosphere and good teachers' work through communication and collaboration with the student population and so ensure higher academic performance and fewer dropouts (Bruggencate et al., 2012). The headmaster is a key factor contributing to the effectiveness of school by showing fair and true concern and respect towards students' personal strengths and weaknesses as well as enhancing group activities that promote

collaboration and help students develop their sociability (Pashiardis,2000; Kythreotis, and al., 2010).

The third thematic unit intends to present the headmaster's ability to motivate the teaching staff providing them with all necessary knowledge and skills that contribute to the effective performance of their duties (Becker and M. Smith, 2011; Saiti and Saitis, 2006). School effectiveness and efficiency are enhanced by collaboration between the headmaster and the teaching staff as well as good communication between teachers and students (Halawah, 2005). An effective headmaster is required to encourage school members' teamwork and decision making and thus create constructive knowledge and a learning community in which each member develops (Marks and Printy, 2003; OECD, 2010). The findings of the research have shown that school leaders can promote teachers' work and important learning outcomes when careful decision-making process, teacher commitment, cooperation, professional development, and innovation are positively valued in the organization (Bruggencate and al., 2012; Jensen, 2010).

The fourth thematic unit deals with the obligation of school headmasters to apply all necessary bureaucratic procedures in order to handle administrative issues. Therefore, a headmaster should be aware of the current legislation, the structure and functions of the Greek educational system, the organizing and updating of the school record, the application of practices that ensure security, cleanness, hygiene, and aesthetics conditions of the school environment, and the pursuit and management of funds and equipment (Everard and Morris, 1996). His/her knowledge, skills, and experience are essential in dealing with administrative issues successfully, especially in small schools where secretarial activities are partly carried out by the teaching staff as extracurricular work unless secretarial support operates with the help of an administrative employee, as provided by the Greek educational system. An effective headmaster is also required to make effective use of the time available while planning all necessary activities (Tomlinson, 2004). It is also important that he/she is efficient with the use of new technologies and information systems (Cunningham and Cordeiro, 2006) while encouraging the administrative and teaching staff of the school to use these educational tools.

The fifth thematic unit focuses on the headmaster's responsibility to build trusting relationships with parents (MacBeth, 1993; Saiti, 2007), various external entities (Hoy and Miskel, 2007), and the wider community (Khalifa, 2012). This resonates with Epstein's

theory of overlapping spheres (Epstein, 1987) asserting that “students learn more and succeed at higher levels when home, school, and community work together to support students’ learning and development” (Epstein and M. G. Sanders, 2006). Effective schools ensure effective communication with parents (Brauckmann and Pashiardis, 2009). Therefore, headmasters should implement an “open door” policy based on a participatory approach and encourage periodical meetings with the parents-guardians so that they cope with issues concerning school performance, objectives, or difficulties as well as students’ behaviour and progress. An effective headmaster should also develop relationships with other schools at a local, national, or European level, exchange practices, and establish school networks so as to implement common action plans (OECD, 2010). In addition, he/she should raise awareness of the performance of school and encourage interactive positive attitude towards the cultural wealth of social, national, racial, religious, and so forth, groups that make up the local community so that school becomes a domain of cooperation with particular reference to student’s development and socialization.

In the current survey, in five thematic areas which include forty suggestions, we tried to investigate in what way headmasters of school units evaluate their role and their work, aiming that our survey results will be useful in planning suitable training programs which will help headmasters to organize and administrate their schools more effectively, while applying internal educational policy. Since this policy is anthropocentric, it is linked directly to the self-evaluation of headmasters’ work, as it leads both to the development of creative educational managers and to the development of teachers who really care about their job, eliminate their isolation, and get actively involved in the various processes that take place in their schools (Nias, 2001). Concurrently, through self-evaluation of their work, headmasters get the opportunity to improve the administration of their human resources, which, under the appropriate motivation, it is possible that it will play a crucial role in the upgrading of the educational results. The study of “National Criteria for Headmasters” showed that the self-evaluation of headmasters’ work, aiming at their continuous and constant personal development, is an important parameter of their role (DFES, 2004).

## **II.5. MODELS OF ICT INTEGRATION IN EDUCATION**

Training competent and competitive people is one of the goals of education. Currently, ICT seems to be an asset to be relied on to achieve this goal in an environment that requires more and more skills. Hence the urgency of integrating them from the ground up, that is, into education. After defining the concept of integration, it is important to address in turn the points on the integration of ICT in education, namely: methods, levels of integration of ICT in the education system, models teachers' appropriation of ICTs, obstacles to the integration of ICT in the education system in general and in the Cameroonian education system in particular. The breakdown of the chapter is as follows:

### **II.5.1. Definition**

According to Legendre (1993), integration, in a broad sense, refers to the "action of making various elements interact in order to constitute a harmonious whole and of a higher level". The concept of "information and communication technologies" (ICT) refers to digital technology equipment that can be used as educational tools. Ex: Computers, servers, digital cameras, digital video cameras, scanners, projectors, CD-ROM drives, DVD players, recorders, printers, modems, software, etc. The integration of ICT in education means a harmonious cohesion between ICTs and all links in the education chain to produce better quality teaching and learning. Thus, each stakeholder in an institution should be able to use ICTs effectively and efficiently to carry out the task assigned to them. Dias, (1999) says that "technologies are integrated when they are used continuously to support and further the objectives of the program and to engage students in meaningful learning" "(...) technology is integrated when it is used in a seamless manner to support and extend curriculum objectives and to engage students in meaningful learning. To support this idea, other authors such as Hadley, (1993), Parks, (1994), Depover, (1996) believe that to speak of integration, ICT should be used in a "daily", "usual" way. , "Regular" or "frequent".

The opinion of Pr. Fonkoua and others (2008) is not so distant, since they say that "it's not just about getting computers into schools without changing teaching practices. The challenge here is especially the appropriation of technologies to change or even improve pedagogical practices. The integration of ICT in schools could therefore be one of the levers of the transformation of the educational act.



But, what is pedagogical integration? Several authors go in the negative to try to understand the phenomenon of ICT integration. They explain that ICT integration is not just about:

Place equipment in classrooms (Bray 1999, Dockstader 1999); let alone go to the laboratory 40 minutes a week (Dias, 1999); nor use computers as an electronic worksheet or reward for students who have completed their work (Dias, 1999); nor use unspecific software (Dockstader, 1999); nor teach how to use ICT (Bailey, 1997).

This type of negative discourse, without wanting to minimize its value, does not make it possible to define precisely what the integration of ICT is, since it puts the emphasis on what it is not.

François Mangenot, (2000) nevertheless proposes the following definition: "integration is when the computer tool is put efficiently in the service of learning". Speaking of effectiveness, a Canadian report (Bracewell and alii, 1996) emphasizes that ICT can be used by teachers either to do better what they already do or to do different things, both approaches being pedagogically relevant. It is important to remember that it is not a question of a physical integration, which is to make available to the actors of the educational system technological devices which they can occasionally use, but that it is rather a question of an educational integration that advocates the effective and regular use of technological tools in the classroom.

### **II.5.2. Methods of integrating ICT into the educational system**

According to Christian Depover (1996), there are two main ways of integrating ICT into a system: top-down and bottom-up.

The top-down or downward approach is an integration technique that involves political decisions to initiate integration. Decisions are taken by the hierarchy and are the subject of decrees defining its terms of application in the field. At first glance, one would be tempted to say that it is the best integration approach, since it aims at changing the entire education system, and therefore seems more apt to lead to changes within the curriculum since on a central decision taxable to all. But in reality, this approach quickly comes up against the resistance of the field teachers who, by their practices refuse to legitimize a technological tool whose contributions to the disciplines are still largely to demonstrate and in which they seem to be of no interest.

The bottom-up or bottom-up approach is the integration technique by which the initiative of integrating ICT into the system and especially into an institution is done by the teachers

themselves. This approach is characterized by the teachers' conception of innovative projects, with the aim of using ICT in the classroom and encouraging their students to use it as well. These projects are those that have a chance of success, if they are undertaken by all teachers at the same time. In this regard, D. Cavallo (2004) argues that one of the characteristics of a fertile environment for change is the fact that initiatives must emerge from the grassroots in these terms "bottom-up and emerging broad-scale growth comes from the basis of many little contributions ".

But the fact that it is only personal and scattered initiatives makes it difficult to ignite the entire system, especially that teachers do not all demonstrate the same motivation to use ICT in the classroom. Thus, dispersed projects cannot have a significant impact on the curriculum so as to modify it.

Cameroonian policy, for its part, seems to be straddling the two approaches, as the educational hierarchy promotes the integration of ICT in the education system by decreeing their integration, but for lack of resources adapted to this policy, a palliative method. seems to be put in place to encourage teachers to be the priority actors of this integration through their personal involvement.

From the foregoing, it must be remembered that the integration of ICT into a system can begin either at the top or at the bottom. Does this integration always take place in the desired way? Hence the need to analyze levels of integration.

### **11.5.3. Levels of ICT integration in the educational system**

Lauzon, Michaud and Forgette-Giroux (1991) explain that there are two types of computer integration to pedagogy: physical integration and pedagogical integration.

In relation to physical integration, they say that it: "(...) consists in placing technological equipment at the disposal of teachers and pupils and two groups to use it occasionally in order to meet the occasional pedagogical demands of the community ". And Bray, (1999) in the same vein, says that "simply placing technologies in the classroom or in the computer lab does not mean that teachers will know how to use them or that the curriculum will be enhanced by their presence" ("Simply placing technology in classrooms or computer labs does not mean that teachers will know how to use the curriculum better for their presence"). Many authors Depover and Strebelle, (1996); Dias, (1999), still agree that physical integration is essential (since it is a prerequisite), but it is the educational integration that should be targeted by the implementation of ICT. And IsaBelle, (2002) goes in the same direction when she states that "in schools, the pedagogical aspect of ICT

is the cornerstone of the success or failure of their integration". In other words, integration is the use of ICT in the learning process.

The integration of ICT into a system may remain at the physical level or evolve to the pedagogical level, depending on whether or not ICTs are appropriated by teachers. This leads to evoking some models of ICT appropriation by teachers.

#### **II.5.4. Models of integration or appropriation of ICT by teachers**

As mentioned above, the main objective of integrating ICT into the education system is for its actors (and in this case teachers) to become experts, with a view to improving the quality of the learning process. But, it must be noted, for this integration to take place, the actors in the education system must undergo certain transformations, or better, go through certain stages. Seen in this light, ICT integration would not be a state of affairs but rather a process over a period of time. Therefore, this process is evolutionary, starting from the non-use "non user" to an exemplary use "expert user" of ICT. For example, several researchers such as Carole Raby (2004) have focused on identifying the phases in which teachers go about integrating ICT into a school, of which some models and their characteristics will be presented here.

##### **II.5.4.1. The model of Moersch (1995, 2001)**

Moersch defines seven levels through which a teacher who wants to integrate ICT into the classroom passes.

The level zero (0) represents non-use, which is a stage during which the teacher perceives the lack of accessibility and time as obstacles to the use of ICT.

Awareness (1) is the stage where the teacher can be in indirect contact with the ICTs present in his environment.

Exploration (2) is the phase during which the teacher uses ICT as a complement to his teaching during reinforcement and enrichment activities; thus engaging his students in the use of ICT.

Infusion (3) is the stage in which the teacher uses technological tools on an ad hoc basis during pedagogical activities to facilitate the processing of information, solve problems and make decisions.

Integration (4) is a crucial moment, difficult to cross because here the teacher involves his students and uses ICT to identify and solve problems related to a theme (databases, word processing, spreadsheet, telecommunication, multimedia).

Expansion (5) is the phase where the use of ICT allows the teacher to come into contact with the outside world.

Refinement (6) assumes the moment when the teacher uses ICT to enable students to search for information, find solutions and develop a result in relation to real problems and especially with their own interests.

**Table 1: Levels of ICT implementation according to Moersch. (Carole Raby, (2004, p.25)**

LEVEL	CATEGORIES	DESCRIPTIONS
0	NOT USED	Perception of lack of time or lack of accessibility of ICT as a barrier to their use
1	SENSIBILISATION	Presence of ICTs in the teacher's environment, but not directly related to him (eg floating count, lunch classes, etc.) or use of ICT for classroom management (eg computerized note management - evaluation) or use of ICT to enrich the masterful presentations
2	EXPLORATION	ICTs serve as a complement to teaching, that is to say, reinforcement, enrichment, repetitive exercises, games, search for information. Involves reasoning structures, level.
3	INFUSION	Occasional use of technological tools to process information (eg spreadsheet or graph to represent survey results). Involves higher level reasoning structures.
4	INTEGRATION	Use of technological tools to identify and solve real problems related to a central theme or a concept in a rich learning context (eg Internet to search for information on a problem to be solved, word processing for production of documents related to the problem to be solved). Involves higher level reasoning structures.
5	EXPANSION	Use of ICTs to enable students to come into contact with the outside world, in the context of solving real problems linked to a central theme or a concept (eg contacting NASA, government agency, etc.). Involves higher level reasoning structures
6	REFINEMENT	Use of ICT as a process, product and / or tool to enable students to search for information, find solutions and develop a product related to real and significant problems for them. Involves higher level reasoning structures and an active learning environment.

### \* Criticism of Moersch's model

A teacher who has to use ICTs to enrich his teachings can not at the same time be placed at the "awareness" stage, where he is not supposed to be in indirect contact with ICT. This model appears linear and therefore presupposes that the path of all teachers is similar, that is to say that teachers go through all levels and in the order proposed.

### II.5.4.2. The model of Sandholtz, Ringstaff and Owyer (1997)

Sandholtz and his colleagues propose a model in five stages. According to them, the teacher moves from the "entry" stage where he becomes familiar with the ICTs placed in his classroom, at the "adoption" stage where he uses ICT for repetitive exercises to support the 'education. Then comes the stage of "adaptation" during which the teacher uses ICTs frequently to manage the classroom and to test new teaching techniques. It follows the stage of "appropriation" during which it modifies its teaching methods to favor the acquisition of new skills among students. At the last stage, that of "invention", the teacher adopts new teaching methods centered on the construction of knowledge, problem solving, critical thinking, which highlight all the potentialities of ICT.

**Table 2: Stages of educational evolution, according to Sandholtz, Ringstaff and Owyer (Carole Raby, (2004, p.30)).**

STADES	DESCRIPTION
ENTRANCE	Establishment of technological equipment and mastery, by the teacher and the students, of the technical rudiments of its use.
ADOPTION	Use of equipment during repetitive exercises to support teaching. Development of strategies to solve technopedagogical problems encountered with ICT.
ADAPTATION	Frequent and relevant use of technology. Use of technologies for class management. Integration of technological resources with traditional teaching methods. Questioning the effects of education with ICT.
APPROPRIATION	Mastery of technological resources by the teacher. Transformation of the teacher's personal attitude towards technology.
INVENTION	Emergence of new teaching methods favoring the acquisition of a new set of skills

**\* Criticism of Sandholtz's model, Ringstaff and Owyer**

This model is more general but is also linear. Moreover, this model suggests that with the integration of ICT, the teacher must necessarily transform his teaching methods. So, how would the process of integrating ICTs into a teacher new to ICT integration take place?

**II.5.4.3. The model of Morais (2001)**

This model defines two phases for the pedagogical integration of ICT. The first is "initiation" which is subdivided into two stages, namely "relevance": period during which the teacher wonders if ICT can improve his teaching practices. Once convinced of the positive impact that ICTs can have on his teaching practices, he faces feelings of anxiety, fear, uncertainty and insecurity related to change.

The second phase: "use" is subdivided into three stages, namely "personal use" where the teacher uses ICT for his personal needs, excluding his pupils; the "professional use" during which it is used to perform its administrative functions. It is only at the stage of "pedagogical use" that he uses them to improve the teaching and learning of his students, who are thus involved. For Morais, the teacher must systematically and progressively follow the five steps to access a pedagogical use of ICT.

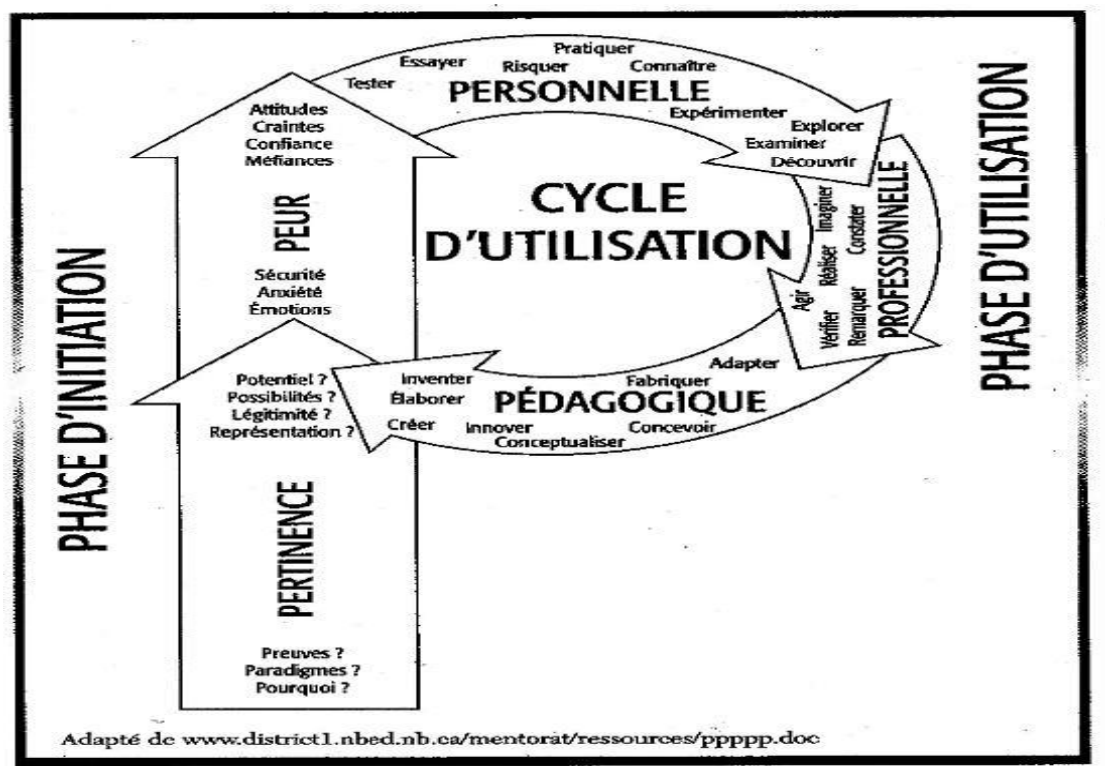


Figure 5: The integration model of Morais. Isabelle (2002, 85).

### **\* Criticism of the Morais model**

This model is also linear, and does not clearly define the steps a teacher goes through as he progresses towards exemplary use of ICT.

These three limited but complementary models have allowed Carole Raby to establish a synthesis model representing the process of ICT integration, which will be used as a foundation later in this work.

## **II.6. THE CHALLENGES OF TEACHING WITH TECHNOLOGY**

Teaching with technology is complicated further considering the challenges newer technologies present to teachers. In our work, the word technology applies equally to analog and digital, as well as new and old, technologies. As a matter of practical significance, however, most of the technologies under consideration in current literature are newer and digital and have some inherent properties that make applying them in straightforward ways difficult.

Most traditional pedagogical technologies are characterized by specificity (a pencil is for writing, while a microscope is for viewing small objects); stability (pencils, pendulums, and chalkboards have not changed a great deal over time); and transparency of function (the inner workings of the pencil or the pendulum are simple and directly related to their function) (Simon, 1969). Over time, these technologies achieve a transparency of perception (Bruce et Hogan, 1998); they become commonplace and, in most cases, are not even considered to be technologies. Digital technologies such as computers, handheld devices, and software applications by contrast, are protean (usable in many different ways; Papert, 1980); unstable (rapidly changing); and opaque (the inner workings are hidden from users; Turkle, 1995). On an academic level, it is easy to argue that a pencil and a software simulation are both technologies. The latter, however, is qualitatively different in that its functioning is more opaque to teachers and offers fundamentally less stability than more traditional technologies. By their very nature, newer digital technologies, which are protean, unstable, and opaque, present new challenges to teachers who are struggling to use more technology in their teaching.

Also complicating teaching with technology is an understanding that technologies are neither neutral nor unbiased. Rather, technologies have their own propensities, potentials, affordances, and constraints that make them more suitable for certain tasks than others (Bromley, 1998; Bruce, 1993; Koehler et Mishra, 2008). Using email to communicate, for example, affords (makes possible and supports) asynchronous

communication and easy storage of exchanges. Email does not afford synchronous communication in the way that a phone call, a face-to-face conversation, or instant messaging does. Nor does email afford the conveyance of subtleties of tone, intent, or mood possible with face-to-face communication. Understanding how these affordances and constraints of specific technologies influence what teachers do in their classrooms is not straightforward and may require rethinking teacher education and teacher professional development.

Social and contextual factors also complicate the relationships between teaching and technology. Social and institutional contexts are often unsupportive of teachers' efforts to integrate technology use into their work. Teachers often have inadequate (or inappropriate) experience with using digital technologies for teaching and learning. Many teachers earned degrees at a time when educational technology was at a very different stage of development than it is today. It is, thus, not surprising that they do not consider themselves sufficiently prepared to use technology in the classroom and often do not appreciate its value or relevance to teaching and learning. Acquiring a new knowledge base and skill set can be challenging, particularly if it is a time-intensive activity that must fit into a busy schedule. Moreover, this knowledge is unlikely to be used unless teachers can conceive of technology uses that are consistent with their existing pedagogical beliefs (Ertmer, 2005). Furthermore, teachers have often been provided with inadequate training for this task. Many approaches to teachers' professional development offer a one-size-fits-all approach to technology integration when, in fact, teachers operate in diverse contexts of teaching and learning.



## **CHAPTER II: LITERATURE REVIEW: USE OF ICT IN THE MANAGEMENT OF SCHOOL ADMINISTRATIVE PROCESSES**

### **INTRODUCTION**

ICT brings about dynamic changes in the society. It is influencing all aspects of life. The influences are felt more and more at schools. Because ICT provides both students and teachers with more opportunities in adapting learning, teaching and managing the individual needs, society is forcing schools to aptly respond to this innovation. It provides newer and more effective ways of mitigating some of the challenges being faced by the educational system of the country. These technologies distinguish themselves by their rapid evolution and revolution, continuously changing the modes of engagement with them. A decade long infusion of computers, and more recently ICT, has demonstrated varying impacts on learning. In the current information age, educational institutions are expected to play a crucial role as the engine for knowledge generation and learning environment. In this regard ICT becomes the vital means to facilitate this task. ICT has become an essential part of our everyday life, accordingly this integration in school improvement is not only for teaching and learning, but also for educational management use, it has become one of the most effective factors in the school improvement. ICT plays a vital role in improving the functional effectiveness of school system. In this unit we will be discussing about how ICT can help the school administrators improve various administrative tasks of schools.

### **II.1. PRESENTATION OF THE EDUCATION SYSTEM IN CAMEROON**

According to Ward (2010) in his work observed that ICT is used for gathering, storing, processing and disseminating information have been an integral part of each organization's processes but the arrival of technologies, which, are capable of helping carry out those processes, changing them, eliminating the needs for some of them and enabling new process to be developed, have made the management of ICT a subject needing specific attention. Over the years, the administrative work of the principal is print-based. Various documents are kept in the form of records. These records provide information on the past, present and anticipated future activities of the school including relevant information from the external environment, which aid decision-making.

The information kept are in the areas of instructional programs and activities, staff and students personnel services, physical facilities, finance, supervision and interaction with stakeholders outside the school. The principal cannot perform his administrative duties without accurate, timely, sufficient and relevant information. The deficiencies associated with storage, preservation and presentation of large volumes of the information in paper form made managerial processes very cumbersome. Consequently, alternative methods provided by ICT become very crucial in a school environment.

This section presents detailed information on literature review on the use and effectiveness of ICT in school administrative processes. The sources of literature include books, journals articles and published studies. This section is divided into the following: general concept of ICT and its effectiveness, effectiveness of ICT in human resource administration, effectiveness of ICT in administration of physical resources, challenges facing the use and effectiveness of ICT in school administrative process and measures that can be taken to improve the use and effectiveness of ICT in school administration.

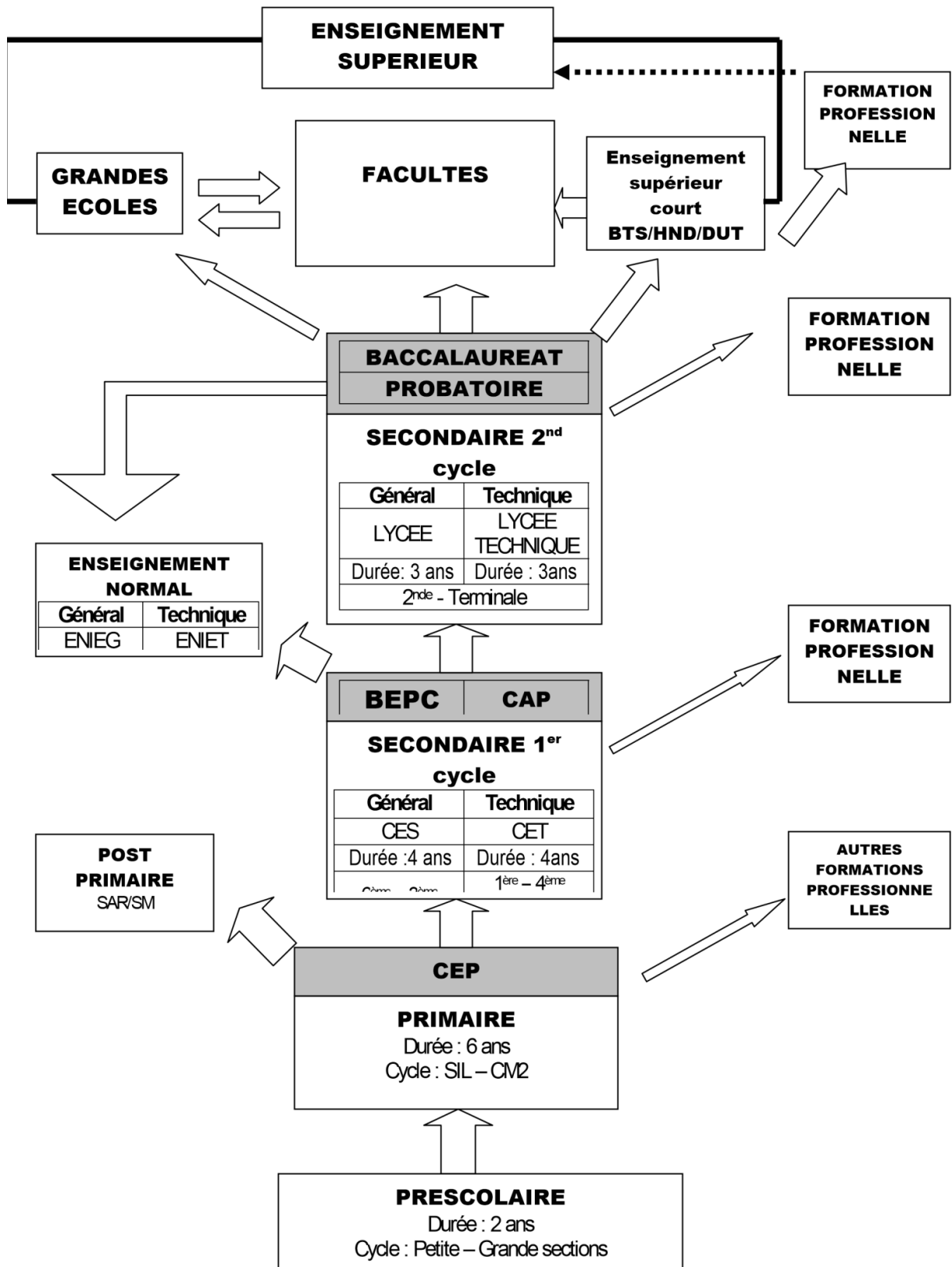


Figure 6: Structure du sous-système francophone (DSSE, 2006)

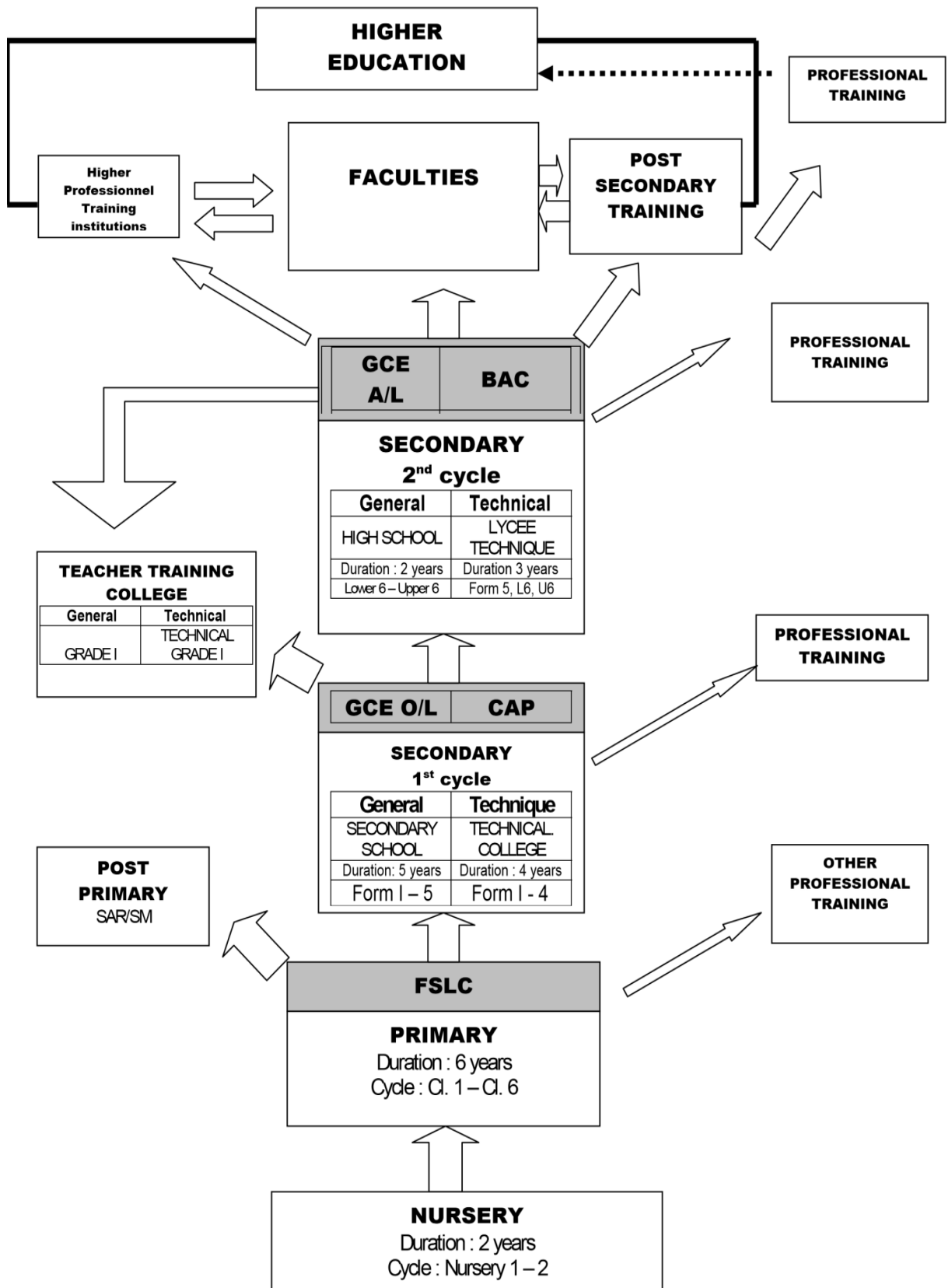


Figure 7: Structure of the Anglophone Subsystem (DSSE, 2006)

## **II.2. CONCEPT OF ICT AND ITS EFFECTIVENESS**

ICT is often used as an extended synonym for information technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers, middleware as well as necessary software, storage- and audio-visual systems, which enable users to create, access, store, transmit, and manipulate information. Basically, ICT consists of IT as well as telecommunication, broadcast media and all the other types of audio and video

Processing and transmission and network based control and monitoring functions (Howe, 2010). Thus, it supports all the activities involving information. ICT is based on the notion that using ICT involves matching it to one's purposes of which it requires a rationale for using it.

ICT basically depends on the local culture and the technology available and how it is configured and managed. The understanding, management and configuration of the available technology might vary the concept of ICT. This variation may differ from a collection of tools and devices used for particular tasks, an organized set of equipment (like a 'workshop') for working on information and communication, components of integrated arrangements of devices, tools, services and practices that enable information to be collected, processed, stored and shared with others and to the components in a comprehensive system of people, information and devices that enables learning, problem solving and higher order collaborative thinking, that is, ICT as key elements underpinning a (sharable) workspace (University of Tasmania, 2011).

The use and effectiveness of ICT in schools covers a wider scope. This includes the comprehensive approach to innovate education systems, methods, and management through Information Communications Technology, restructuring education system, diversifying teaching-learning methods and practices, engaging all stakeholders of education and adapting rapid changes in society and the environment and enhancing education efficiency, effectiveness, and productivity (Gwang-Jo, 2009). In the administration of the school, ICT can also be effective in the administration of human, physical and financial resources.

### **II.3. USE AND EFFECTIVENESS OF ICT IN THE MANAGEMENT OF SCHOOLS**

The current evolution of the school environment seems to be characterized by a not inconsiderable phenomenon: the growing importance of ICT in society, which obliges schools to review their curricula. As such, new ICT requirements and new work strategies and new roles in the emerging knowledge society must be taken into account (Djedje, 2007). In today's world, ICTs fundamentally change the way we live, learn and work. These changes means that technological tools and the creative application and effectiveness of technology can improve the quality of life by making administrative procedures more efficient within the institution. In this light, it is important to highlight the use of ICTs by administrative and teaching staff.

ICT might improve the efficiency of the educational process. This can be observed in (a) reducing the time needed for instruction, and (b) more efficient administrative processes. Regarding the use of ICT in schools' management and organization, it is indicated (Zain, Atan and, Idrus, 2004; Becta, 2007; Muir-Herzig, 2004; Goolsbee and Guryan, 2006) that more and more secondary schools use intranets to support the administrative personnel in performing administrative tasks (e.g., financial management) as well as the daily organization of the school (e.g., planning of the rooms). Other potential applications of ICT in the schools' management and organization tasks reported by studies include the collection of pupil test scores, the reporting of the pupils' school outcomes to the parents, the sharing of information among the teaching staff, the development of tests and assignments, and the monitoring of progress in pupils' scholastic achievements (Becta, 2007; Price Waterhouse Cooper, 2004). The latter is enhanced by the popularity of 'data driven teaching'.

It is believed that all of these potential applications should benefit the efficiency of the school (administrative and teaching) personnel. This intuition was confirmed in two studies, namely the study of Selwood and Pilkington (2005) and the study of Price Water house Cooper (2004). In both studies, the findings suggested that ICT does help address workload issues for some teachers, particularly those who are confident in its use. There is also some evidence that the use of ICT in administration allows schools to become better in communicating with the pupils, the parents, and others within the local community. In addition, some findings show that ICT enables school administration to collect a lot of data which are useful for strategic, self-evaluation and monitoring purposes.

Aristovnik (2012) examined at a country level ICT efficiency and the impact of ICT on educational outcomes using a production frontier approach (i.e., Data Envelopment Analysis). Using input and output/outcome data on a sample 27 EU-countries and some OECD countries, Aristovnik (2012) found that the efficiency of ICT differs significantly across the great majority of EU and OECD-countries. The efficient countries include Belgium, Korea, Finland and Norway. The inefficient countries are found to have considerable room for improvements. Aristovnik (2012), however, warns that one should look at more than just the efficiency in ICT use. For instance, in their study, Slovakia and Poland are found to be relatively efficient in their ICT-use which at first sight appears to be a good performance. However, a detailed analysis of the input and output/outcome data of these two countries shows that this relatively high efficiency is mainly due to the low input levels. Thus, in spite of a high efficiency in ICT use, a significant increase in ICT expenditures is needed in those countries.

#### **II.4. THE USE OF ICT BY ADMINISTRATIVE STAFF**

In a school, the manager or rather the administrative head uses ICT tools to set up databases that enable him to better perform his daily administrative tasks. Thus, a database is a set of information about a given subject and logical links to it (Gulzar A., 2009). In addition, a data base allows storing, classifying, retrieving data, and performing calculations on these data. Generally, a database is controlled by a management system for performing the search, sorting or merge of data, as well as any other request relating to these data. Among the database management systems (DBMS), the most common are those associated with relational databases, where information is stored in files, in tables.

The administrative follow-up of the school is the one that has developed the earliest in schools. The specificity of school activity promptly raised the question of the articulation of these means with the rest of the operation of the school. Usages established in the majority of institutions are a separation of the administrative, at least in the procedures entrusted to the actors according to the definition of their positions. In addition, administrative staff are increasingly involved in the management of information (electronic letters to families, teachers) and communication (mailboxes). Managing the schedules of people, rooms and material resources, as well as absences is often the responsibility of school life. However, the indispensable continuity between teachers and educational staff in this field now takes on a new form with the development of computer resources.

Henceforth virtually all establishments use specialized software, thus relieving themselves of a puzzle often generating conflicts (Bruno Devauchelle, 2005). In reality, such software does not solve conflicts, even if they relieve certain problems (complexity of changes, for example, monitoring of premises, and management of attendance). The arrival of a school life note including attendance in the patent of the renovated colleges will reinforce the essential character of this management of the organization of the teaching activity.

Increasingly, the management of services, schedules and staff, in addition to the legal dimension, is based on administrative procedures within an institution. The head of the school is obliged to follow closely with the management team the use of these tools from the specifications to the evaluation of the practices.

The importance of logistics in recent years has been enhanced by the introduction of technologies to optimize resource management. Thus, the relaxation of school time can be hindered or encouraged according to the tools used. A better occupation of the premises makes it possible to propose different educational solutions for example.

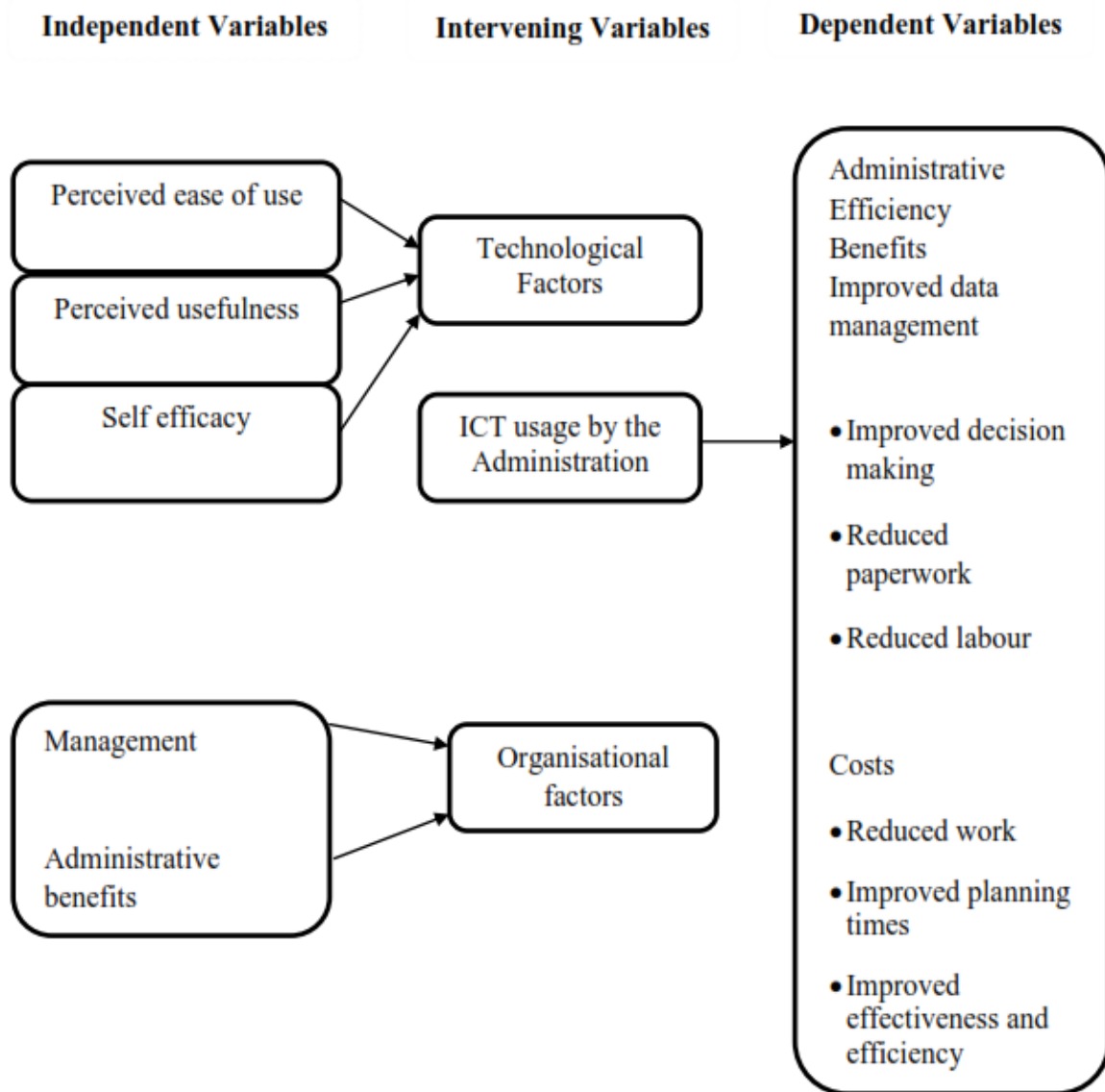
It should also be stressed that ICTs allow good management of scores (marks) and evaluations. The place of scoring is central to the teaching activity and even more so to evaluation. Note management software gradually imposed itself, not without pain, in the teachers' rooms. Facilitating the administrative follow-up of pupils' curricula, these tools mainly favor a better readability of communication documents with families and other school partners.

In the context of school discipline, we mean under this name all the practical processes designed to ensure the proper ordering of the exercises of all kinds in which school life is composed. It is usually from the administration that the general regulations relating to school discipline emanate, and it is to the heads of the establishments that the regulation of detail is held, together with the collaborators. These particular establishments can vary greatly, not only from one school to another, but from one class to another in the same school (Gaillard Jean, 2017). The requirements of the discipline cannot be exactly the same in an urban school and a rural school, a boys' school and a girls' school, a school with only one class and one school that has several. School discipline embraces a very wide field and is the very basis of the organization of an institution. Thus, the management of pupil absences is a particularly sensitive element when “close” and “constant” follow-up of pupils is carried out.



Administrative within the sector of services should use ICT because it provides many benefits at different levels operational level, tactical level and strategic level. As the figure below reveals, the use of ICT in Education management within the sector of services could improve management functions in secondary schools e.g. communication, ability to exchange data, teamwork, customer relations, visibility of services, and competitive advantage etc. This statement is based on the fact that ICT allows schools management to obtain, to process, to accumulate and to exchange information. Furthermore, in a knowledge administrative context, ICT can support transformation within and between tacit and explicit knowledge. Successful knowledge administrative initiatives could transform the small management capacity into a sustainable higher performance.

Table 3: A table showing an Operational Benefits of ICT Adoption and it Usage the administration



The above model shows the relationship between the independent variables and the dependent variables. The perceived ease of use, perceived usefulness and self-efficacy of ICT relate to technological factors while management and administrative beliefs relate to organizational factors. These factors when put in place determine the ICT usage by management which in turn leads to benefits of using ICT.

## **II.5. ROLE OF ICT IN SCHOOL ADMINISTRATION**

Change has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Rapid growth in the field of education has made governance in academic sector a very complex task. The 21<sup>st</sup> century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. Cost-effective technology combined with the flexibility in learning and administrative activities is essential to enhance efficiency.

Information and communication technologies (ICTs) play a vital role in supporting strong and effective management and administration in the education sector. It is noted that technology can be used directly from student administration to various resource administrations in an educational institution.

### **II.5.1. Organizational functions and Professional development of school staff**

#### **II.5.1.1. Professional development of school staff**

In parallel with the curriculum for students, there must be professional development of the staff within a school. The personal productivity and professional practice of teachers are enhanced with the use of ICT. First, is an awareness stage in which teachers and staff become ICT literate with regard to what technology is available and how it might be used. Second, as teachers and staff learn basic skills, they begin to apply various ICT tools to their regular tasks and projects. Third, as teachers and staff become more capable and confident with ICT, they begin to integrate and overlap both subject areas and tools. Last, is a change in professional practice in which teachers are now enabled to design lessons to incorporate larger, more complex, real-world projects using ICT tools and resources. As ICT is introduced into school systems, there is a tendency to move from discrete skills training to reflective practice and integrative professional development. Budgetary allocation and

provision for release time for teacher professional development seriously impact on the ability of a school system to incorporate ICT in a meaningful way.

### **II.5.1.2. Organization functions: organization accompaniment function**

Three main sectors define this mainly logistic function whose practices are developed in the establishments:

The accounting and administrative monitoring of the school is the one that has developed the earliest in schools. From the end of the year 70 the computerization of this sector of its multiplied, following the logic of the companies which have also, a sector of this nature. The specificity of the school activity quickly raised the question of the articulation of these means with the rest of the operation of the establishment. The operational continuity that one knows in the company (GPAO, global solutions) does not really echo in the school world. The offers of service providers in the sector, however, try to integrate more and more functionalities and thus bring together the various sectors of activity of the establishment through a single solution. The practices established in the majority of the establishments are a separation of the administrative, at least in the procedures entrusted to the actors according to the definition of their posts. However, it is not uncommon for bridges to be made, especially in small institutions where the tasks of administrative staff can take a very versatile character (secretary-CPE being an extreme example). The trend is to link the functions at the technical level. It is necessary for the head teacher to properly measure the organizational consequences of certain choices. In fact, the evolution of the definition of each other's tasks can have many induced consequences and raise the question of responsibilities and even of confidentiality.

In addition the administrative staff is more and more involved in the management of information (electronic letters to families, teachers ...) and communication (mailboxes ...). Its insertion into the educational community, encouraged in Catholic education, requires developing not only tools but especially exchanges with all staff and partners of the school to develop a common culture (participation of administrative staff in the work on the school project)

## **II.5.2. The use of ICT by teachers**

Henceforth, the regulations on the use of ICT are centered on their integration in all disciplines. The integration of ICT into the content of programs (National Commission of Programs, 1992) is very progressive in the texts and even more in the practices of the disciplines concerned. The example of mathematics is quite revealing: if the integration of calculators could be done, the transition to spreadsheet, the geometry is problematic, still currently in some institutions. The teacher who begins to use ICT first does so for educational production and management purposes.

This type of activity concerns the part of the work that takes place outside the classroom: writing notes, exchanging emails with colleagues, consulting documentary sources and classroom management (attendance, academic achievement, etc.). The implementation of this type of activity involves the mastery of basic technological skills (use of computers and management of computer files, use of word processing and spreadsheet, technical basics of electronic mail and navigation on the Internet) Web for documentary research.

At this stage, the advantages of ICTs are particularly motivating for teachers (Poellhuber and Boulanger, 2001): the teacher sees the usefulness of learning how to use a word processor quite quickly. In this case, the teacher who, for a given learning activity, had to gather a good amount of documentary resources, had to invest a considerable amount of time. Now, ICTs come to assist in its search. In this regard, a growing number of virtual places are taking place to facilitate and encourage the discovery of teaching resources. One has only to think of the emergence of educational portals such as the teachers' room (a place for the sharing of disciplinary and trans-disciplinary pedagogical resources for professors and professors of the college network).

Thus, by means of headings such as “Les trésors pédagogiques” and “Les dossiers chauds”, it encourages, reflects and innovates in the teaching of science at the college level, notably through the pedagogical integration of ICT. In the community network, as in the university network, the Internet is used to a large extent to search for information for course preparation purposes (Lapierre and Gingras, 2001).

Educational management and production activities help to develop the technological skills of the teaching staff. The motivation to pursue the integration of ICTs is influenced by

factors such as the attractiveness of discovery and the perceived usefulness of the time devoted to carrying out the activity (Poellhuber and Boulanger, 2001): as reported by one of the professors who participated in the research of Poellhuber and Boulanger. Added to these factors are equally important, such as access to equipment, pedagogical and technical support, as well as the user-friendliness of the software used.

Many teachers who are beginning to take an interest in ICT want to integrate them as tools to support their masterful approach (Guay, 2002). Here, the professor takes advantage of ICT resources to enrich his class presentations considerably through multimedia presentations. Poellhuber and Boulanger (2001) speak of "masterful interactive". It also means making documents available to students at all times, such as a website with links to topics taught in the course. For teachers who integrate multimedia diffusion activities, their perception of their level of competence is positively increased (Poellhuber and Boulanger, 2001): the quality of the productions created by the manipulation of software multimedia presentation, editing web pages or graphics is sometimes surprising, often rewarding. "Excitement, pleasure, pride and the feeling of being part of the planet" are the words that come to mind when a colleague is a history professor when she recalls the publication of her first website of its students (Perreault, 2001).

Teachers appreciate a virtual space where their documents are accessible at all times: the students' common apologies, such as "I have forgotten the instructions in my locker"; "I did not remember that it was for today", to justify the delay in returning a job no longer have their place, the vast majority of them now having access to the Internet at home. In addition, the opportunity to provide regularly updated course notes is appreciated by students as teachers and teachers: they do not have to wait until the document has been printed and distributed so that students can benefit from it.

Furthermore, a study was carried out by Fonkeng and al. (2006), the usage of ICT/ICTE and/or the digitalization of lessons can motivate teachers and influence their mentalities if there are primes allocations in their salaries. It is for this reason, why head of schools cannot use their own salaries in order to purchase ICT equipment that will ease the treatment of administrative documents on campus.

## **II.6. PERSPECTIVES ON THE USES OF ICTS IN EDUCATION**

The teaching function and the support-organization function represent the two poles of these uses. They are traditionally opposed to each other, but their interweaving is increasingly great because of networking, sharing of information and the necessary synergies to be implemented in many school situations. However, separating them, as part of this writing, is a way of clarifying things and clarifying certain characteristic elements.

### **II.6.1. The function of teaching**

It covers four parts whose extent of use is variable but whose strategic importance seems to us of the same level:

#### **II.6.1.1. Conduct of pedagogical and didactic activities**

Henceforth the prescriptions on the uses of the TIC are centered on their integration in "all" the disciplines. This is not self-evident and surveys of the implementation of B2i in schools show that this is rarely the case. If in professional and technical disciplines in which ICT is an object of learning it seems that from now on the practices are well established, it is far from being the case in the other disciplines of teaching. The integration of ICT in the content of programs (National Commission of Programs 1992) is very progressive in the texts and still more in the practices of the concerned disciplines. The example of mathematics is quite revealing: if the integration of the calculator could be done, the transition to spreadsheet, geometry etc. is problematic, still currently in some institutions. Equipment, training, maintenance are often mentioned, but resistance in all disciplines is much deeper. They also affect the representation that everyone has of the management of space-time class, the relationship with students, or even the relationship to the content itself.

The development of the Internet marks particularly in recent years. This is why an essential question now arises: the place of documentary activity in student work.

#### **II.6.1.2. Management of the organization of the teaching activities**

The management of the schedules of the people, the rooms and the material means, as well as that of the absences is often the responsibility of the school life. However, the necessary continuity between teachers and staff in this field is now taking a new shape with the development of computer resources. Now almost all institutions use specialized software, relieving themselves of a puzzle often causing conflict. In reality, these software

do not solve conflicts, even if they relieve some problems (complexity of changes for example, monitoring of premises, attendance management). The arrival of a school life note including attendance at the patent of the renovated colleges will reinforce the essential character of this management of the organization of the teaching activity.

The management of services, schedules, staffing, in addition to the legal dimension, requires a reflection on the "management of human resources". Should we organize a monitoring of teachers and pupils (badges, fingerprint recognition etc ...)? Should we rely on "computer science" for choices that are essentially human? The head teacher is in the need to closely follow, with the management team, the use of these tools from the specifications until the evaluation of practices. The importance of logistics in recent years has increased with the introduction of technologies to optimize the management of resources. Thus the relaxation of school time can be slowed down or encouraged according to the tools used. A better occupation of the premises makes it possible to propose different teaching solutions for example.

The management of student absences is a particularly sensitive element as long as there is a "close" and "constant" follow-up of students. In addition to the terms of the law (see the obligations of the CNIL, National Commission for Information Technology and Freedom), there is especially the ethical and educational dimension of the potential offered by the proposed tools that is questionable. Camera, display, individualized follow-up, opening to the outside of the school (the parents) cannot be the only technique, they require the highlighting of a framework to carry out the action, based on explicit educational choices .

### **II.6.1.3. Management of notes and evaluations**

The place of the notation is central in the teaching activity and even more so in the evaluation. Note management software has gradually imposed, not without pain, in the rooms of the teachers. Facilitating the administrative follow-up of students' curricula, these tools mainly promote a better readability of communication documents with families and other school partners. It becomes progressively incongruous to send a handwritten mail or a handwritten note. However, the personalization of handwriting has led teams to request the maintenance of handwritten assessments and parents to claim a "re-humanization" of school reports. Behind this demand is a much larger problem, that of the psychological impact of the report cards and, more generally, assessments in the relationship that students and their families have with the school. For some, the report card is the only real communication with the school universe. For others the newsletter is a way to read, in

every line and in every word, an open book in the culture of the school, the culture of evaluation and the choices of teachers and the educational team.

The use of such tools in classrooms with a video projector, but also the analysis that can be made from this information base of teacher evaluation practice can give rise to important debates. . The apparent scientificity of a curve or the analysis of a student's means or progressions sometimes leads to the simple questioning of the relevance of the marks or the reality of a student's progress. The gradual evolution towards the logic of competences risks, in the coming years, to put the question of the relevance of the rated evaluations back.

#### **II.6.1.4. School Orientation and Student Project Support**

The place of school guidance within the school activity is growing all the more because the malfunctions of the school are often denounced by analysts.

(training-employment adequacy ...) either by the heads of the institution (role of the different actors in the orientation process) or by the families themselves).

For several years, offers have been developed, based either on audio-visual tools (cassettes of trades) or on computer tools (software to help school guidance), the practices of the institutions are very diverse and unequal.

The search for solutions, technical or otherwise, to help with student orientation and personal project is above all a question of defining an orientation policy for the school. This indispensable prerequisite can only be done at the level of a governing board, as parents are often involved in the process. It is only after the choice of tools can take place (knowing that it is necessary to be vigilant concerning certain pharmacies offering services close to sectarian currents).

#### **II.6.2. Importance of ICT in the management of administrative documents**

##### **II.6.2.1. Use of ICT in Student Records Keeping in Management of Public Schools**

Student personnel services deals with elaborate programs of students accounting, maintenance of records, reporting of all information to various agencies, students' progress, racial and sex data for affirmative action and projections of student enrolments. This therefore calls for establishing and maintaining a system of record keeping. Beta (2003) as quoted by Kipsoi (2012) indicate that ICT has played an important role in management in educational systems through availing data widespread to parents and the



public at large through central administration website and in some cases through direct access to central database by school personnel. Kipsoi (2012) notes that, ICT can be valuable for storing and analyzing data on education indicators. Devon (2004) as quoted by Matovu (2012) states that recording data electronically, storing it, controlling and sharing it with colleagues are vital to reducing workloads through available ICT structures. This calls for secondary school administrators to integrate ICT in their managerial system.

The introduction of Free Primary Education in 2006 (FPE) and subsequently the Secondary subsidized Education has made schools to receive a large number of students thereby generating a lot of data. Mbiti (2007) states that for educational planners to succeed they need a lot of assistance and co-operation from institutional heads, classroom teachers and field officers in providing reliable data regarding the current education in the nation. The data includes enrolment statistics, statistics on teacher numbers, completion rates, transition rates and retention rates. Head teachers and class teachers need to have techniques of processing the same data, (Mbiti, 2007).

The student management system is basically a student information system. Student information such as admission attendance, grading, discipline and family information is efficiently managed through this system. The data of a student can be accessed by just feeding in the admission number of the student. Okumbe (2001) notes that data on days present, days absent, credit earned, health problems need to be established and maintained. The main advantage of a computerized data base is the ability to quickly add, delete and locate specific records. Creation forms make it easier to enter and edit data as well. According to Mdlongwa (2012), ICT will make routine tasks such as accessing pupils' records much faster than before. He notes that previously, loads of files would be kept containing pupils school records and one had to physically look through all of them just to find information. Record keeping becomes more orderly and reliable, manual records used in the past could be lost due to poor filing. Finally administrative costs of photocopying are lowered and less paper wasted. Access 2002 software can be used to generate a student's information database to replace the admission registers. This becomes useful when old students write back to schools for letters of recommendation for certain appointment.

#### ❖ **Record keeping**

1. School records are books, documents, files and CD-ROMs containing information about what is going on in school (eg school, school, non-school activities and

important events, etc.). school and other relevant information on the growth and development of the school.

2. School records are official transcripts or copies of deeds, events, other matters retained by the school administrator, school records may be considered authentic records or instruments or official transactional records or event held in the school office. Therefore, each school must maintain certain specified records.

3. Importance of School Records: School record keeping includes the fact that school records tell the school's history and are useful historical sources.

4. Tell the story of the school and are useful historical sources.

5. Facilitate continuity in the administration and management of a school.

6. Facilitate and improve the provision of effective guidance and counseling services for students in the areas of social and academic careers.

7. Provide necessary information about alumni by higher and other institutions and employers of the workforce for admission or placement.

8. Facilitate the provision of information to parents and guardians for effective monitoring of the progress of their children / pupils in schooling or performance.

9. Provide data for planning and decision-making by school heads, ministries of education and related education authorities.

10. Provide a basis for objective assessment of the state of teaching and learning in a school, including the performance of staff and students by supervisors and inspectors.

11. Provide information to the school community, general public employers, and educational and social scientists for the advancement of knowledge.

12. Allow school principals to gather information about students and staff for decision-making by higher authorities,

13. Security of the courts and other related government agencies as the occasion requires.

14. Provide a mechanism such as the school calendar for the productive management of time and coordination of work and school activities.

15. Serve as a databank from which both the head teacher and the staff and even the students can draw.

### ❖ **Some important school records**

- Admission and Withdrawal Register: This is a permanent record of entry and exit information, including details of the education and progress of each student passing through the school. 'school.
- Attendance register: An attendance register is a book in which the presence or absence of students in a school is recorded daily. It is a statutory register that must be kept by each school. This record is kept individually. The class teacher is the custodian of this recording.
- Logbook: The Logbook is a historical record of events that have significant effects on school activities.
- The Visitors' Book: The book is intended to record visits by important personalities, including government officials and ministries of education or other related government agencies or other visitors related to the school.
- Personal files of staff and students: It is necessary that the school has as much information about each teacher and student as possible without violating their privacy.
- Cumulative Recording Record: The Cumulative Student Record is a wealth of information about students' cognitive, emotional and psychomotor development.

### ❖ **Report Card / Student Card**

1. Retains student achievement data on an ad hoc basis.
2. It helps to monitor students' academic progress.
3. It is a complement to the cumulative registration records.

### ❖ **Notes / lesson plan**

1. It gives information about what a teacher plans to teach students at a given time.
  2. It clearly shows the level of preparation of teachers and their level of competence.
  3. He challenges teachers for the task ahead.
- Work Plan and Record: It reflects the estimate of the academic work that teachers expect to accomplish in each subject based on the number of lessons they will have during each session. It shows the teacher's ability to organize the work of the year and his resourcefulness and enthusiasm for student progress.

### ❖ **Time book and staff logbook**

1. They provide information on when staff report and close their work.
2. They promote regular attendance and punctuality
3. They help to control absenteeism and blatant indiscipline in the staff.

- Transfer and departure certificate: The transfer and the graduation certificate is the official exit of the student after the end of studies or departure during studies in a school.
- Library records: The library will have many records such as stock register, issue register etc. Much of the routine function of the library can be automated using the library management software.
- Register of stocks: this is the register of all equipment and materials available in the school, including laboratories

#### **II.6.2.2. Use of ICT in Maintaining School Accounts on Management of Schools**

According to Mbiti (2007), the concept of managing school accounts differs from that of keeping school accounts .Management of school accounts is the responsibility of school administrator. It involves budgeting and supervision of officers who keep the school accounts. Okumbe (2006) states that management of school accounts is concerned with preparation of school budget and monitoring expenditure which is basically involved with maintenance of appropriate record keeping , accounting and auditing procedures. ICT can help managers to retrieve, evaluate information in relation to budgets. Budget making begins with formulating some fundamental assumptions that are pertinent to the institution which must be derived from the past experiences on the schools financial position (Mbiti, 2006).

Review of previous year's budget is important. Did the school overspend? If so, in which vote heads? Administrators will identify the above issues with ease if the financial records are computerized. School enrolment is important during the budget making process. Students' databases will provide the information of the enrolment rate of that year and the projections for the coming year.

A budget is a management tool as well as a planning tool. School managers can utilize it well when it is captured and stored in a computer. Management of school records also entails supervision of officers who keep the school accounts. Secondary schools usually employ accounts clerks to do this work under the supervision of head teachers. Several accounting documents are kept by these officers. These include the fees registers, cash books, petty cash books, accounts records registers and receipt books (Mbiti, 2006). Maintaining these books of account maybe cumbersome especially with a large student population. ICT software and financial databases will improve efficiency in maintaining the books of accounts. Supervision by head teachers will also be easier with ICT. Preparation of final accounts for auditing can be done using computers. Income and

expenditure statements and the balance sheets preparation can utilize computers and hence reduce the anomalies associated with manual systems.

In a nutshell, he reviewed studies have established that utilization of ICT has a positive influence on the four aspects of management under investigation in this study.

ICT plays a crucial role in management of secondary schools. Ilomaki (2009) observes that ICT can be used to manage information more efficiently resulting to better organization and administration. ICT makes both internal and external examinations work easier. ICT facilities enhance proper recording and keeping of students assessed work. It is valuable for storing and analyzing data on education indicators and students assessment. Communication is crucial in any organization; ICT ensures that the right information is transferred to the right person within the shortest period of time. Financial management in a school demands for better and modern ways, ICT becomes a necessary tool in ensuring better financial management.

➤ **ICT potential in record keeping**

The utility of keeping school records with information and communication technologies (ICTs) is for the following reasons:

- Administrative efficiency: A major failure in achieving the educational goal of secondary education is inefficiency of the principal in the recordings. With the introduction of information and communication technologies such as computers, digital libraries, e-mail, the Internet and so on where information is stored and disseminated, managers can better manage their records and become effective in their role as administrators.

- Information Availability: Information and communication technologies will help maintain adequate and accurate records in our schools and make them easily accessible.

- Easy Recovery: It also allows easy access and dissemination of information on school records, will be available for national planning, financial budgeting, effective implementation of educational programs and policies.

School record keeping is the collection, storage, retrieval, use, transmission, manipulation and dissemination of information for the purpose of enhancing communication, decision making and the ability to resolve problems in the school system. It is therefore necessary that this process be as accurate and accessible as possible. The use of ICTs to maintain

school records will help to facilitate and improve school administration to achieve the goals of secondary education.

➤ **Planning**

Creating a schedule that maximizes teaching time, allowing time to meet the needs of school students, giving staff time to meet and plan, organizing various school and extracurricular school activities is very important for any school. The use of ICT makes sure that planning is going well.

Some of the important activities of the school that need to be planned and scheduled are:

- School calendar
- Teaching schedule
- Review Schedule
- meeting schedule.

### **II.6.2.3. Management of relations with the outside of the institution**

The development of the Internet has reintroduced, sometimes brutally, the question of the communication of the establishment. Whether it's a teacher who has done the school's website alone, whether it's students who showcase the school on the Web, or whether it's messenger management for example, many situations arise. which, eventually, can provoke important questions.

➤ **Communicating with Parents**

Communication is important to inform parents about school activities. It is also a vehicle for developing awareness and understanding among parents of their role in the learning and development of their children. It is also an opportunity to learn about the children in your classrooms. Communication between schools and families is essential for building trusting relationships that foster parental involvement. Parental involvement in schools and social institutes is necessary for youngsters to develop successfully and to make decisions that will have positive outcomes for their future. The role of new ICTs in improving parental involvement in schools and social institutes and uncovers barriers that prevent usage of technology to promote communication. As society becomes increasingly dependent on technology, schools are investing more time and money in technological means of communication. Access to computer and Internet technologies is increasing all over world in work places and schools. Both educators and parents are provided with

access to electronic communication. It is well established that building home-school partnerships is a powerful avenue for increasing the satisfaction of parents and the community with schooling and for improving schools. Parents' involvement in their child's education is a key factor in the child's scholastic success. Parental participation ranges from paying little or no attention to too much attention. As the teacher, he/she must help manage the parental participation so that students are accountable for their own learning.

➤ **Areas of Communication**

Parental involvement encompasses direct contact with teachers, parental actions at school, and parental actions at home. Following are the different kind of communications and involvement expected of parents:

- Basic obligations of parents, includes the obligation of parents and families to provide safe, healthy home environments. The school can aid parents by providing workshops, presentations, and general information about health and safety issues. Schools are also expected to provide parents the information needed to assist their children with homework and other assignments.

- The schools are expected to communicate regularly with parents and keep them informed about school programs and their children's progress in school.

- Parents are expected to participate in school activities and provide ample volunteer services for the betterment of the school. Giving parents the information they need about opportunities to volunteer is one way to increase family involvement.

- The parents involvement in decision making, means giving parents the tools they need to become active members in the governance of the school. ICT can play a vital role in communicating and collaborating with parents and the community. Some of the tools and technologies which help in this process are outlined below.

#### **II.6.2.4. Tools and Technologies for Connecting with Parents**

E-mail: Schools can create and send out a classroom newsletter to keep parents up to date by e-mail. They can collect the e-mail addresses in the beginning of the school year or give parents the opportunity to sign in for the newsletter on the school website. Individual teachers can send e-mails when there are problems in the classroom or for giving parents good news about the learning process of their children. E-mails can be sent individually or in group. It is very easy to make groups of addresses in the most common

e-mail programs. Parents can read and respond to e-mails whenever they have time. E-mails are also available in the LMS and students contributions in terms of chats and forum postings get e-mailed automatically by the system.

These curated apps save teachers time, offer discounts for bulk app purchases, and help teachers find the best apps by category and grade level. Many of these apps integrate with Google Drive to provide an easy way to turn in homework, and many of these apps offer lesson plans for teachers. App Packs are only available for Google Apps for Education customers. These App Packs are of three types. Some of them are free, some are freemium (These apps are provided free of charge, but a premium is charged for advanced features) and many are paid. Most children today are familiar with the mobile apps even from their pre-school days. Now a day's many schools are developing their own mobile apps, depending on their needs. It may be giving learning modules or may be connecting school with community.

#### ➤ **School Management Tools**

Interactions sharing ideas and communications with teachers, parents, alumni and community members become the major part of school management. School management includes admission of students to various courses, assigning subjects and classes to teachers, maintaining records, communicating with parents, preparing various certificates, analyzing various data etc. It should help all the stake holders in participating actively in decision-making process. The functions of a school manager are to manage the school and formulate policies that best suit the needs of the school as well as the overall interests of the students. A manager is responsible for school planning with a view to creating learning environment for their students and nurturing talents. Hence, aside from the time and energy spent in school management, a school manager should have a good understanding of the school itself as well as the trend of education development.

Going without school administration software could be costing your time and effort. Earlier times school administration was run without softwares. But present day we are living in a digital world and needs are changed. Luckily, there are lot of school administration software available free of charge. Some of them are listed below with special reference to Open Admin for Schools.



### **II.6.3. Challenges of ICT Integration in School Administration**

There are several explanations for the failure of ICT utilization in public secondary schools. A study by Howell and Lundall (2000), on the key factors blocking educational institutions from using ICT as an administrative tool was conducted in Indonesia. The study sample constituted of 10 schools, in rural Indonesia. 10 head teachers, 30 students randomly sampled and 20 teachers purposively sampled. From the study Howell and Lundall identified major challenges such as lack of electricity, lack of funds, and insecurity. On top of that, very little of the equipment available nationally is allocated for ICT use in education, in schools. Howell and Lundall also cited insufficient funds, insufficient number of computers, lack of teachers with IT skills, teachers' inability to integrate the computer into the different subject areas and lack of appropriate microcomputer teaching programs as the major challenges facing introduction of ICT in school administration. Karsenti (2004) conducted another study on the problems blocking public secondary schools from equipping themselves with computers in Kenya.

The study involved 8 public secondary schools in Nyanza province, 8 Principals of these school, 24 students randomly sampled and 16 teachers purposively sampled. The study established that hardware was one of the major constraints on the use of innovative technologies in school administration. Also the high costs of equipment greatly exacerbate the group usage ratio. There was also the mind-boggling difficult feat of achieving a student-computer ratio of 10:1 and 100% Internet connection in most of the primary, secondary, and higher educational institutions in Kenya. Furthermore, in Kenya, the low density of telephone lines and the high costs of installing and maintaining them constituted a major barrier. A good number of authors (Intsiful, Okyere and Osae, 2003; Selinger, 2001; Tunca 2002; Bakhoun 2002) have also cited lack of tools, inoperative telephone lines; marginal, disparate, inadequate and obsolete communications networks; fluctuating electric power supplies; recurrent power brownouts and blackouts; ailing road systems an major problems facing the application of ICT.

Moulton (2002) in a study on how infrastructure may affect ICT use in school administration found that there was a thorny issue of infrastructure, which is indispensable for ICT use by educational institutions for administrative purposes. The study emphasized on the participation of all public secondary school teachers in the ICT integration process of school administration. Further, the study suggested that principals should be mobilized and

encouraged to use ICT. It is observable that aside from the issue of unequal distribution of technological equipment across public secondary schools, lack of appropriate equipment, and qualified human resources, further contribute to the challenges facing application of ICT in school administration. This implies that without the establishment of necessary interventions, many schools will lag behind in the application of ICT in their administration.

From the review of literature, it is evident that there are a number of scholars; Razak and Zohora (2012), Ruby (2004), Etudor-Eyor, Ante and Emah (2011), Telem (2001), Kalusopa (2005), Cheryl (2005), Grey (2000), Howel and Lundal (2000), Kasenti (2004) and Moulton (2002) that have carried out various studies on the application of ICT in school administration. Razak and Zohora (2012) conducted a study on the areas of ICT utilization among teachers and principals of Malaysian schools. The study findings revealed that majority of the teachers were not aware of the existence of ICT national policy. However the study only concentrated on whether the schools administrations were aware of the existence of ICT policy in Malaysian schools hence failing to adequately addressing the perception of ICT in the administration of the schools. Raby (2004) conducted yet another study on the application of ICT in Human resource in Uganda. The study revealed that in most public secondary schools, ICT application in human resource administration was the responsibility of the school principal who needed to ensure that the best interest of his human resource were served through effective ICT infrastructure and staff professional development.

Additionally, a study by Cheryl (2005) focused on organizations and firms. Focusing on secondary schools could offer more insights. Regarding the application of ICT in financial administration Grey (2000) found that most institutions have accounting software packages to help produce statutory accounts and reports. However the study did not inform on how administrators could apply ICT in financial administration in public secondary schools. Several challenges on ICT Integration in school administration have been identified in several studies (Karsenti, 2004). However, these challenges have not been examined in light of the challenges facing administrators in the use and effectiveness of ICT in the administration of public secondary schools. Lack of adequate empirical literature on the use and effectiveness of ICT in school administration makes it essential to examine various areas of application, namely in human resource management, physical resources, and administration of financial resources.

## **II.7. DIFFERENT EXPERIENCES OF ICTS IN AN EDUCATIONAL ENVIRONMENT**

### **II.7. 1. Empirical cases of ICT in Côte d'Ivoire**

In Côte d'Ivoire, a West African country with a population of 17 million in 2003, the current President's desire to give special importance to ICT has resulted in the creation of a ministerial department responsible for new information technologies. Some forty Ivorian experts have worked on the development of a national ICT development plan in Côte d'Ivoire to the point institutions and have set up several organizations involved in the control and control of the functioning of the ICT sector (IGÉ, 2000).

However, upstream, there is a lack of a real concrete policy and an ICT strategy to give the direction to follow and to define the scope of intervention of each of these bodies. As for education, it represents about 43% of the Ivorian national budget (Gbongué, 2000). For nearly three decades, Ivorian education experts have organized national conferences and national consultations as avenues to explore in order to find solutions capable of meeting the challenges of the Ivorian school (Gbongué, 2000). Governmental and administrative decisions to initiate the implementation of ICT in the Ivorian education system have been taken. These were concretized by the development of three institutional projects for the implementation of ICT (1987, 1999 and 2000) at the general and public secondary school: the first failed at the experimental stage (1987-1989), the second could not see the day, and the third was implemented (Hiné, 2000 ). Yet ICTs have many potentialities that could be beneficial to teachers and students in Côte d'Ivoire.

Indeed, the case study conducted by the Organization for Economic Co-operation and Development (OECD), 2000, in schools in the 21 countries of this international organization on the implementation of ICT, reports that the use of ICT by teachers and school administrators promotes the updating of pedagogical records and the streamlining of administrative tasks. ICTs thus free up time for teaching or professional development. They also help reduce isolation by using e-mail and the Internet to communicate and collaborate with colleagues, parents and the outside world. Finally, the use of ICT has contributed to the growth of professional development activities (online self-study) and the opening of the school to the outside world. In addition, this study has highlighted the arguments that favor the implementation of ICT in schools.

More recently, in an ICT integration project, students have adopted ICTs as communication tools and gradually, a virtual community between these students from a

primary school in Senegal and a primary school in Quebec has emerged. (Djedje, 2007). Laferrière, Bracewell and Breuleux (2001) share the same point, demonstrating, through projects and research, how ICTs have contributed to the emergence of virtual learning communities between students and virtual communities. practices between primary and secondary school teachers. In a more recent project, Laferrière, Breuleux and Inschauspé (2004) also highlighted the contribution of ICT to break the isolation of rural schools by networking them.

Seck (2001) points out that some positive impacts of ICTs in some schools remain limited by the lack of effective policies to disseminate them, a reality that results in a lack of production, poor control of practices and effective controls. on these impacts of ICTs in the education system. As a result, local ICT implementation initiatives in schools often come from isolated teachers whose motivation for educational and technological innovation is well above average. In these conditions, practices on the ground in the management of technological projects remain scattered and officially unknown (Pouts-Lajus and Riché Magnier, 1998). However, Gros, Giacquinta and Berstein (1971) stress the need to question the elements that support the implementation of an innovation at school, because the knowledge of these could encourage and encourage other schools to undertake local initiatives. Moreover, no research on the implementation of ICT in secondary school exists in Côte d'Ivoire.

### **II.7.2. ICT and Institutional Management in Cameroon**

The ability of ICTs to change the nature of work in school management must be considered. The use of ICT allows for greater efficiency in the school. According to Fonkoua, Djeumeni, Ella Ondoua and Bjounesse Tayim, it appears from the analysis that for the moment the aspects in which ICT intervene on the management of educational practices are document capture and examination management.

For example, at the Yaoundé Bilingual High School, the use of ICT has greatly improved the management of educational practices. Censors prepare their schedules more easily. They manage the results of examinations much more easily. In short, ICT allows managers to better plan educational activities.

The analysis reveals that training is essential for a better exploitation of this tool.

The use of ICT has increased opportunities for collaboration with individuals within or outside the institution for certain topics. Thus, ICT can have a positive impact on many if they are mastered.

Moreover, the regular use of ICTs is not only a significant factor that can erase gender differences, but can also contribute to raising the criteria for academic success. Academic success, previously linked to traditional values, can be oriented through ICT to competence, that is to say, to self-fulfillment made possible as interactions with different agents of socialization occur.

While these interactions are harmoniously regulated by ICT, they can serve as vectors for validated social behavior.

The accumulation of knowledge is only possible in the long term. This implies a better appropriation of ICT by the school. Indeed, ICT is a potential symbolic revolution at school in the sense that they change the relationship to knowledge.

ICTs and their implications for education are not perceived, from the outset, by learners, teachers, or administrators as a tool for knowledge appropriation. ICTs bring interaction. This assumes that the learner is accompanied by an adult. The involvement of the adult can increase in education and in some cases the possibility to participate in the school life of the child.

### **II.7.3. Integration of ICTs in Mali in schools**

Mali opted for the development of New Information and Communication Technologies and participated in several meetings and events on this theme, notably the first International Conference on "Africa and New Technologies" (Geneva, October 1996), the Bamako International Conference 2000, the African Regional Preparatory Conference for the World Summit on the Information Society (WSIS), the first phase of WSIS (Geneva, December 2003) and the second phase (Tunis, November 2005) ).

Despite the political will affirmed at the highest state summit, the development of new technologies in training institutions is difficult to transfer at the national, regional and local levels because of social constraints and economic difficulties peculiar to African countries. Rarely, we witness the emergence of carriers or relays at different stages of the project (proposal, implementation, use, development, sustainability).

Voluntarism plays on a progressive vision based on the theme of modernization. However, facing 80% illiterate populations living below the poverty line, this message is struggling to pass. How to overcome in these conditions the cultural distance that separates, even opposes traditional Africa and new technologies of information and communication?

The pedagogical environments related to the use of ICTs are for the politicians and specialists of the Education a priori carrying hopes to take up the many challenges of the

Education for All (EFA). The major challenge is to resolve the difficult equation between the potential of ICTs to achieve the EFA goals ahead of the Dakar 2000 Forum and the potential threat posed by new technologies for preservation of African cultural identity. Is there a long-term risk of witnessing the widespread use of new technologies as a destructuring of "traditional" knowledge, based on a collective memory? In the African context, cultural resistance to the introduction of the Internet is still real.

In Mali, Distance Learning (EAD) is currently about to go beyond the embryonic stage: with the opening of the French-language Digital Campus (CNF) in Bamako, distance learning opportunities are offered to students and students. teachers. Also, calls for applications are regularly launched for distance learning organized by the AUF (Agence Universitaire de la Francophonie) from the CNF.

The access and use of ICTs in the various educational institutions in Mali depends on several factors, the main ones being the political will of the State, the dynamism of the school or university administration, the vitality of the partnership and the legal status (public / private school, technical school, vocational school, training institute, faculty, high school, research center ...). In general, private institutions successfully develop computer integration strategies, while in the public, the shortcomings are in the establishment of partnerships and equipment of computer rooms (generator, computer, Internet connection, Internet radio antenna, video projector, scanner, printer, photocopier, burner, stabilizer, educational software ...).

In Mali, ICTs are rarely integrated into public or private primary education because of the high costs of these technologies and the high number of learners. In addition, young children are not able to use new technologies alone for prolonged periods. At the secondary level, students' enthusiasm for ICT is very high. Yet the ICT program is most often summed up by the transmission of rudimentary knowledge about computers and the Internet. It is not uncommon to see students lose valuable time learning different parts of a PC and word processing at the expense of other knowledge related to the pedagogical use of ICT.

In Mali, the resistance to change of a layer of teachers more or less open conflict with the proponents of new technologies proves that special efforts must be made on the one hand in the field of initial and continuing training ICT teachers (in general, opponents of ICT are those who do not master or do not have access to the computer tool), and secondly in the production of national educational

content promoting the use of ICT. Integrating ICT into the education system is now an urgent necessity: to meet the demands of a labor market in search of modernity and new skills necessarily based on the mastery of new technologies.

## **CHAPTER III: METHODS AND TECHNIQUES INVOLVED IN ICT IN THE EDUCATIONAL FIELD**

### **INTRODUCTION**

The implementation of an approach is to adopt the objectives set according to the problem. Thus, the framework of this study which must be apprehended, requires the use of methods and techniques for the collection and analysis of information. As such, any scientific work to be done must follow a methodology that attributes its value and originality. It makes it possible to specify and define methodological reflections capable of serving as a support for research. This is what will highlight the target population, the finding aid and the data processing. Understanding this chapter requires choosing and describing the study area, collecting data and choosing the sample, and analyzing the data and limitations of the study.

### **III.1. CHOICE AND DESCRIPTION OF THE STUDY AREA**

The conduct of scientific work involves the exposure of certain geographical parameters to delimit the study area. To this end, the description of this area requires presenting the framework of the study and delimiting the field of investigation to better understand the environment.

#### **III.1.1. Framework of the study and delimitation of the field of investigation**

In order to better define our object of study, we should have had at least two fields of investigation, but confronted with temporal and financial factors, we are constrained to limit ourselves to a single secondary school that is Government bilingual high school-Ebe. The choice of Government Bilingual High School Etoug-Ebe is hardly a coincidence, because it is one of the largest establishment in the city of Yaounde with a cosmopolitan school population composed of all social strata, so we seems quite representative.

#### **III.1.2 Presentation and Location of Etoug-Ebe Bilingual High School**

Etoug-Ebe bilingual high school, which is our study universe, is one of the largest and oldest secondary schools. It was first established as a General Secondary School before being erected in high school in 1998. It is located in the central region, Mfoundi department and in the Yaounde 6th district Etoug-Ebe and at least 500 meters from the



handicapped center (photo). Thus, Etoug-Ebe bilingual High School, which serves as a field of inquiry, is currently headed by a Headmaster. The school population of this establishment is 3700.

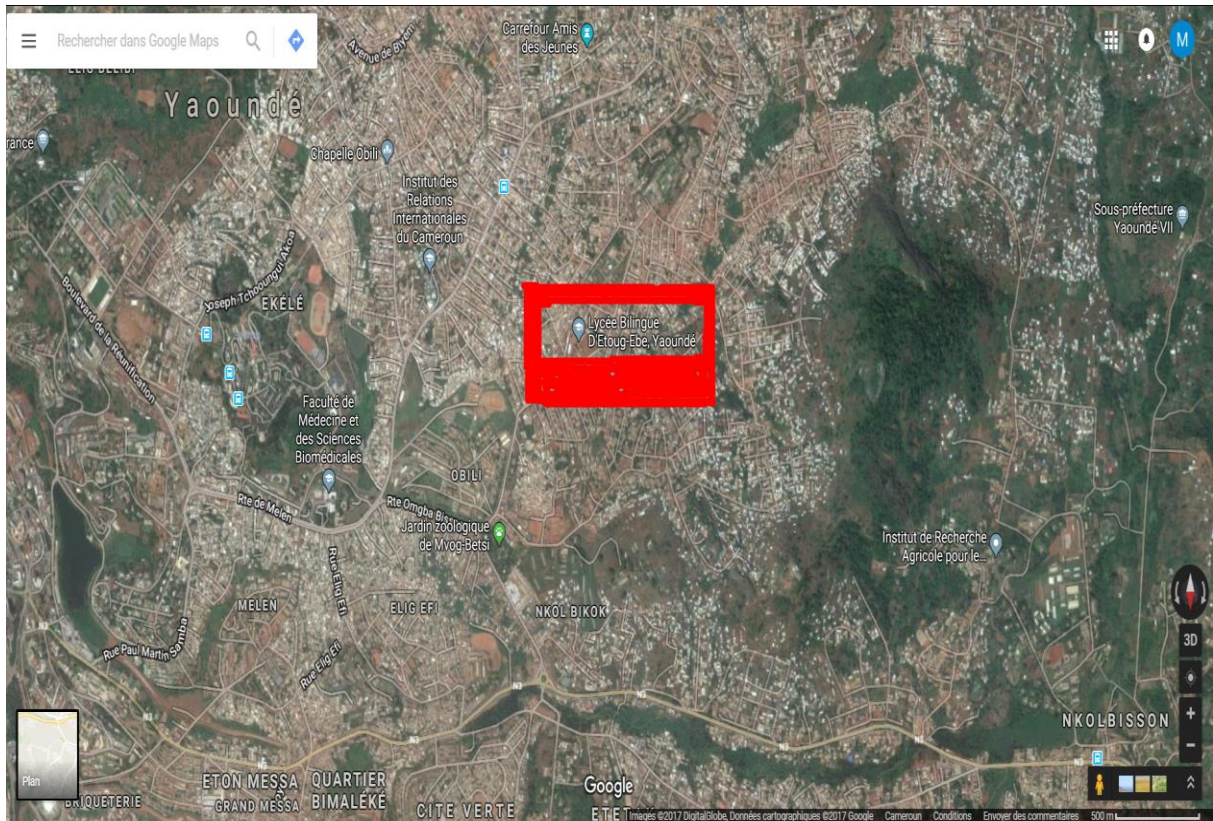


Photo 1: Location of the Government Bilingual High School Etoug-Ebe.

### III.2. Human resources

The bilingual secondary school in this borough is composed of an Anglophone section and a Francophone section. This high school contains 3700 students in 49 rooms including 28 for French speakers and 21 for English speakers. The photo allows students to see the class attire of this establishment.



Photo 2: Students of the Government Bilingual High School Etoug-Ebe.

### **III.2.1 Teaching staff**

The total number of teachers is 200 of which 98 are French-speaking and 102 English-speaking

The teaching staff consists of teachers from several disciplines. For computer teachers, there are eight teachers, three Anglophones and five Francophones. Among these Francophone teachers, we have two academics, a maintenance engineer and networks, a senior technician in computer management, a patentee in maintenance and computer TV. All English-speaking teachers are bachelors who have completed professional training in computer science.

### **III.2.2 Administrative staff**

The School has an administrative staff composed of several members led by a Principal assisted by eleven (11) Censors among whom there are two (03) ladies. Work discipline is provided by fourteen (14) Supervisors. Financial and material management is entrusted to a housekeeper. It should be noted that the administrative staff is supported by a support staff composed of four (04) secretaries, three (03) librarians, two (02) maids, four (04) sentinels and three (03) couriers.

### III.3. ORGANIZATION OF BILINGUAL HIGH SCHOOL

The organizational chart of this school is as follows:

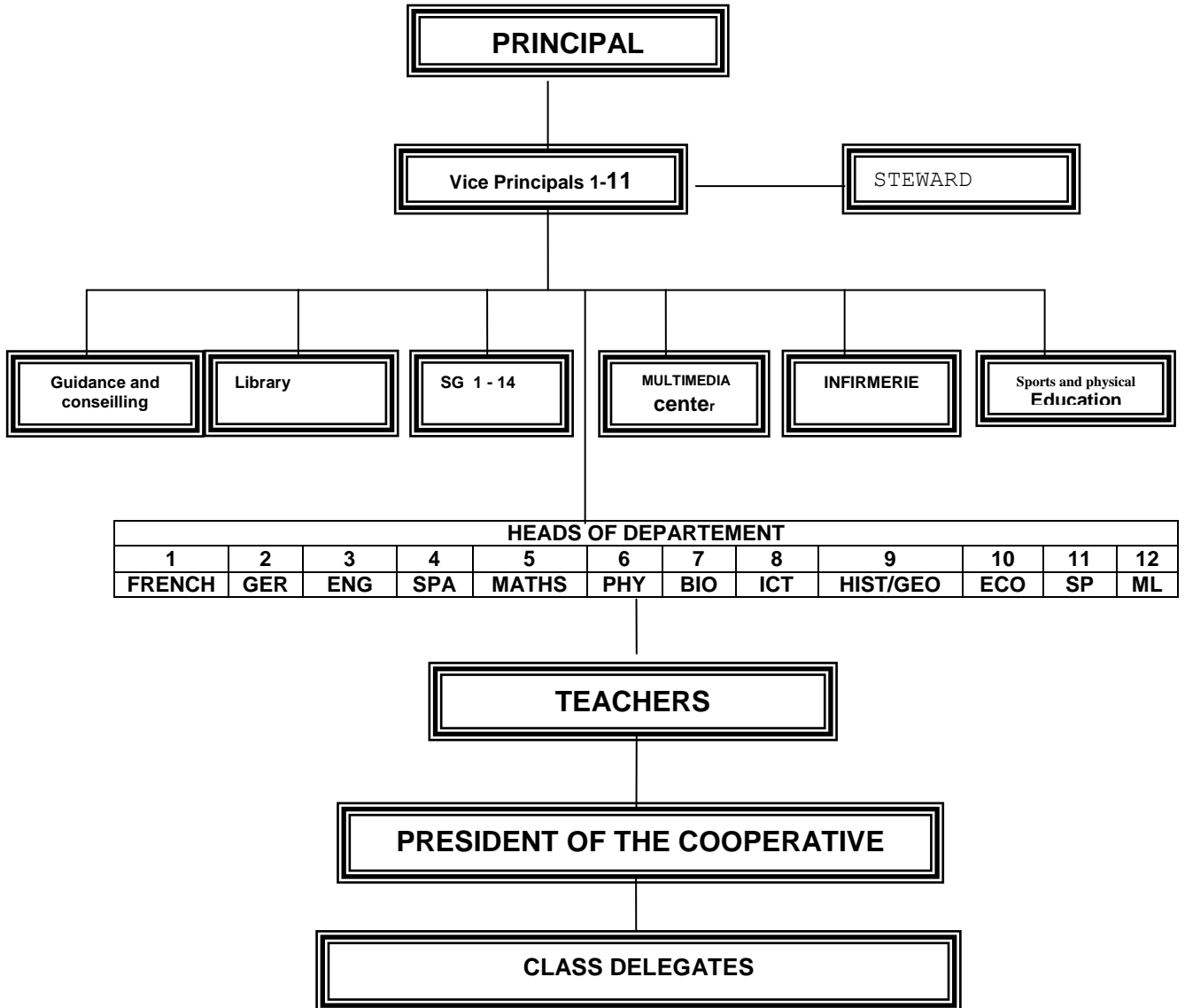


Figure 8: High School Organization Chart (Survey, 2017)

This institution is co-ordinated by administrative staff consisting of a principal, censors, supervisors general, area supervisors (sentinels), a housekeeper, librarians, a sports department head, a nurse and two guards. There is also a staff responsible for guidance and social assistance.

### **III.4. FUNCTIONING OF THE BILINGUAL HIGH SCHOOL**

The administration is ensured by the headmaster who puts in place an adequate general policy for the proper functioning of this institution.

In addition, each censor supervises one or two departments entrusted to him. As part of the discipline, the supervisors general take care of it to avoid training offenders in our schools. They are the ones who keep order in the classrooms and throughout the school. Teachers are respectively at the head of their specialty department. They have the heavy burden of animating their departments by verifying the effectiveness and progress of the teachings.

The courses are taught by the teachers and they have the concern to follow scrupulously the progress sheets established during the teaching councils supervised by the censors who are assisted by the pedagogical animators. In addition, they are required to follow, train and evaluate students.

### **II.5. HARDWARE AND SOFTWARE EQUIPMENT**

This establishment has a football stadium, a canteen etc. Very large space, moreover new classrooms were newly built. One entry reserved for students and the main entrance is for teachers and others.

The computer room contains 40 computers that regularly report hardware and software failures. In these computers the operating system installed is Windows XP and the installed software is Microsoft Office, TerSchool, Gest'Ecole and Admisco.

At the administration level, only the principal has a computer, a printer and a photocopier all of which are managed by a secretary.

### **III.6. METHODS OF DATA COLLECTION AND TARGET POPULATION**

The information analyzed in this study in Government Bilingual High School Etoug-Ebe was collected through the combination of investigative tools related to direct observation, interviews and data analysis. Thus, a good and well-conducted study is to first proceed by direct observation that will allow us to verify the effectiveness of ICT in administrative procedures in schools.

### **III.6.1. Data collection methods**

The choice of data collection methods will depend on the objectives pursued by the researcher. There are various methods for collecting data from a scientific work. As part of this study, preliminary documentation, interviewing, observation, and questionnaire surveys are required.

#### **III.6.1.1. Literature search: secondary data**

The search for secondary data is this part that groups together all the documents consulted to develop a good job. It is a bibliographic phase that has been devoted to documentary research and has made it possible to take stock of the existing literary knowledge on the subject in general ICT and the management of administrative procedures in school environment. Thus, the statistical information obtained has made it possible to develop a realistic and relevant problem. In addition, the research objectives require us an adapted methodology that combines qualitative and quantitative approaches. The method used is of the "snowball" type, a work allowing access to another through its bibliographic references. The documents consulted during the literature search are publications of many recognized authors in the scientific community. The literature search is based on the literature review which has helped to better understand the point of view of some researchers in the field of digital economy and education as well as the management of schools.

Some authors admit that there is a link between agro-industrial activities and the physical and economic environment and local communities. Many of the available documents (studies, reports, books, theses, dissertations, articles and website) closely related to the effectiveness of ICT in the management of school administrative procedures and the purpose of the work were consulted and served as a basis for secondary data collection. In addition, the exploration of the existing documentation on our theme allowed us to better understand the school environment in Cameroon and to refine the problematic of the theme of our study and in particular to identify the research question. It also helped to define the aspects to be addressed and to develop data collection instruments. As such, the documents consulted led to circumscribing the theme and having a theoretical basis in order to allow analysis and discussion of the results.

Secondary data were supplemented by primary data collected through observation, interview and questionnaire survey.

### **III.6.1.2. Data search: primary data**

The search for primary data requires a number of techniques and tools depending on the type of data. Thus, primary data were collected from field surveys using a survey. In addition, the techniques adopted are based on questionnaire, interview and direct observation.

#### **➤ Questionnaire survey**

There is a variety of tools and techniques for collecting data in the social sciences. As part of this work, the data collection tool is the questionnaire. The questionnaire is a tool for collecting information that "allows for the direct questioning of individuals by defining in advance, through a qualitative approach, the modalities of responses through closed questions" (Thietart et al., 2003). In this definition of Thietart can be completed by adding that the modalities of answers can also be defined through so-called open questions. Thus, the purpose of the questionnaire survey is to have the point of view of administrative and teaching staff of Etoug Ebe Bilingual High School. Through this questionnaire, we want to know the importance of ICT in the management of tasks in schools. In addition, it is an instrument par excellence of the measurement of the opinions. It is asked to format the data based on the observation of the responses of part of the selected population and the result will be generalized to the entire population. The purpose of this questionnaire is to reflect the opinions and opinions of staff regarding the management of administrative procedures using the uses of ICT tools.

#### **➤ Observation**

Initially, observation was a research technique practiced in anthropology and contributed to the "highlighting of cultures and social routines" (Nga Ndongo, 1999). Direct observation owes its nobility to Bronislaw Malinowski. According to Nga Ndongo (1999), the use of direct observation consists in "recording, by descriptive or analytical notes, actions or observations perceived in the field, in a natural context".

In fact, during the course of the research, particular attention is paid to any activity or event closely related to the stated objectives of the study. Direct observation was facilitated by field trips. These descents made it possible to observe the different uses of ICT in schools. Thus, direct observation also requires, and in particular "the keeping of a field journal, in which the collected data are recorded daily" (Beitone et al., 2000). This method allowed us to see and record the various opportunities related to ICT tools within

the school. Hence, the observation of this study was carried out by the use of an instrument called evaluation grid which permitted us to collect data on the field.

Admittedly, direct observation derives primarily from sense organs, especially sight and hearing. At this level, the study made use of the interview in order to complete and facilitate the understanding and exploitation of the data thus observed while following the recommendations made by Raymond Quivy and Luc Van Campenhoudt (1985, 2011) to this effect, that “the method of maintenance followed by a content analysis is certainly the most used in parallel with the methods of observation.” In addition, the interviews reinforced this phase of the survey.

### ➤ **Interview**

Inspired by this investigative technique, Alain Beitone and his co-authors think that "interview is a technique that consists of organizing a conversation between the interviewee and the interviewer. In this spirit, he must prepare an interview guide, which includes the topics that must be addressed imperatively.

Based on the majority of data collection techniques in the social sciences, maintenance lays out many forms and variants related to the dynamics that is responsible for its deployment. Whatever the choice of form, the main characteristic of the interview methods is a direct contact between the researcher and his interlocutors and a weak directive.

As a researcher, the interview allowed us immediate access to the desired information. Speaking of information, Quivy and Campenhoudt point out that it may be the perception of a situation or an event, interpretations or experiences stated by the respondent. During this research, the interviews provided an opportunity for direct contact between the investigator and resource persons who provided information of various kinds. The collection of information was based on the interview and the researcher was provided with an interview guide (Appendix 1). This stage of the work was spread over three months, between February, March and April 2017. The interview led the investigator to make field trips to this school. The interview guide made it possible to exchange with the resource persons who are the administrative staff and certain other available and likely persons (teaching staff) to bring a plus to the research. The interview focused on the effectiveness of ICT in the management of administrative procedures within a school. This interview leads to highlight the perception of staff on the different aspects of the use of ICT in schools and the related brakes. So, this operation was used to collect qualitative

information. In the frame of this study, the interview grid permitted us to assemble elements or items in order to build an evaluation grid.

The iconographic method makes it possible to use the search for illustrations and photographs for the writing requirements of a given subject. It allows geographical representations to be clarified while giving rise to selected viewpoints on photographic, figurative or drawn images, maps or other graphic codings. In addition, a large number of maps and photos were made by us during the field trips and they led to better arguing our work.

### III.6.2. Target population: sampling

In the field of research, the notion of population contains animate or inert beings, elements, events of a well-defined group. In other words, it is the set of homogeneous and / or heterogeneous subjects on which the researcher plans to generalize the conclusions of his investigation. As part of this study, the population consists of staff from the establishment of the exploratory area. Thus, the development of the sample will take into account the choice of the population of this school.

In the study area, some people were selected who could be maintained through the head teacher who knows the members of his educational community well. The average of respondents in this study environment is between 50 and 100 people. As such, the tables present the different people surveyed for the said study. Table 3 represents the administrative personnel and their different duty poste in school.

**Table 4: Administrative Personnel (Survey, 2017)**

<b>Fonction</b>	<b>MEN</b>	<b>WOMEN</b>	<b>Total</b>
<b>Principal</b>	0	1	1
<b>Vice Principals</b>	8	3	11
<b>Bursar</b>	0	1	1
<b>Discipline Masters</b>	10	4	14
<b>Secretaries</b>	1	3	4
<b>Liberians</b>	2	1	3
<b>Messengers</b>	2	1	3
<b>Sentinelles</b>	4	0	4
<b>Total</b>	27	14	41



**Table 5: Teaching Staff ( 2017, Survey)**

<b>Teachers</b>	<b>Effectiveness</b>
Anglophones	102
Francophones	98
<b>Total</b>	200

The constitution of this sample was subject not only to the logistical and temporary constraints but also to the goal sought in this study.

### **III.6.3. Data Analyzes and Limitations of the Study**

Many applied instruments make it possible to structure the approach of a study. Whenever possible, it is essential to analyze the data collected and highlight the constraints related to this work. The stages of data analysis involve the processing and processing of the information collected as well as the analysis methodology.

#### **III.6.3.1. Processing and processing of collected information**

The conduct of the investigation takes into account the ethics of anonymity and information revealed in all confidentiality. The counting is a set of operations of verification, purification of the questionnaires and finalization of the codification. In simple cases of reduced sample, a manual treatment makes it possible to highlight the results as well as their interpretation.

Thus, the processing of the cards is done manually but after the collection of the primary data. By practicing large surveys, computer counting is necessary. It should be noted that the practice of counting reveals the main themes in order to put them together around a central idea. In addition, each theme chosen is marked by a cross or a color in order to distinguish between ideas. In general, the system is used for questionnaires as well as interviews and observations in order to easily compare the information obtained.

In addition, the data processing will consist in formulating the information collected in the field while integrating these survey data in a spreadsheet as well as to verify the hypotheses of the study:

- Effectiveness of ICT permits the preparation of pedagogical duties like school time table, lessons sheet progressions, school calendar activities and marks management processes in school administration;
- Effectiveness of ICT assists the discipline department to better organize discipline in school administration;

- Effectiveness of ICT facilitates the follow up of teachers in their lessons preparation and conceiving evaluation questions in school administration;
- Effectiveness of ICT helps to keep records of staff in school administration.

Descriptive statistics for mean and frequency are used for the analysis of the data in this study. Thus, these data make it possible to make calculations and to appreciate the social, political, economic and cultural indicators. In addition, the Microsoft Excel 2010 Spreadsheet and SPSS (version 20.0) software are used for accurate statistical processing of data as well as the construction of tables and the drawing of figures. These data are based on the effectiveness of ICT in administrative procedures in schools.

### **III.6.3.2. Analysis methodology**

Whichever approach is used, it is essential to make a good choice of data collection and analysis methods and to apply them correctly. From the beginning, it is important to specify the data that will be analyzed and synthesized to answer the key questions. Indeed, the collection of data makes it possible to obtain a set of data in order to bring appropriate criticisms. Thus, it is necessary to determine the approach used to achieve each of the specific objectives. In a very specific context, it is important to identify for each objective indicators in accordance with relevant targets, according to the method of calculation of these indicators as well as the corresponding information collected. For each specific purpose, it is related to an appropriate method. The information used is data collected in the field from the population of Etoug-Ebe High School to allow the construction of the analysis.

### **III.7. Limitation of the Study**

According to Best and Kahn (1993), limitations are conditions beyond the control of the researcher that may place restriction on the conclusions of the study and their applications to other situations. One key limitation that was encountered in this study included failure of some of the respondents to truly answer to the questions asked about the use of ICT and the effectiveness in school administrative processes. Also, the respondents were equally scared from answering the questionnaire. By so doing, the researcher was unable to collect all the responds on time for analysis. Another challenge that was faced in the study was the aspect of time. The researcher worked under tight time restrictions both from work and school and thus could not comprehensively reach to other respondents within the sampled size so as to fill in

the collected instruments. Some of the other limitations that were faced in this study included but may not be limited to access to experts for editing and proofreading of the work.

## **PARTIAL CONCLUSION**

It was a question of making a choice and presenting the organization and operation of the School. Thus, information collection methods were based on desk research, direct observation, interviews, questionnaires and iconography that provided the opportunity to gather data for the analysis of this study. However, many of the information-gathering constraints were related to sample formation and the unfriendly behavior of some members of the educational community. However, the information gathered for this work provided a basis for analysis. In addition, the results are discussed and discussed in the next chapter.

## CHAPTER IV: ICT EFFECTIVENESS IN THE ADMINISTRATIVE PROCEDURES OF THE ESTABLISHMENT

### INTRODUCTION

ICTs can make a real contribution to the administrative management of schools, provided they are used appropriately and appropriately. Effective uses of ICT in education obviously involve the appropriation of the computer, office tools or more specific learning. ICT will help as didactic, learning, management, access to information and knowledge, and digital literacy at all administrative levels. Thus, this chapter is devoted to the presentation and analysis of ICT effectiveness in school administrative procedures arising from field information. As such, it exposes the challenges that face the ICT application in the school administration.

### IV.1. PRESENTATION OF THE SURVEY RESULTS

The specificities of the population studied will consist in highlighting some aspects that have attracted our attention during this work. It is important to highlight the aspects and tasks of school staff.

#### IV.1.1. Characteristics of the studied population

Out of a total staff of 150 in the establishment, all responded to the questionnaires sent to them

##### IV.1.1.1. Human characteristics of the gender and ages of the respondents

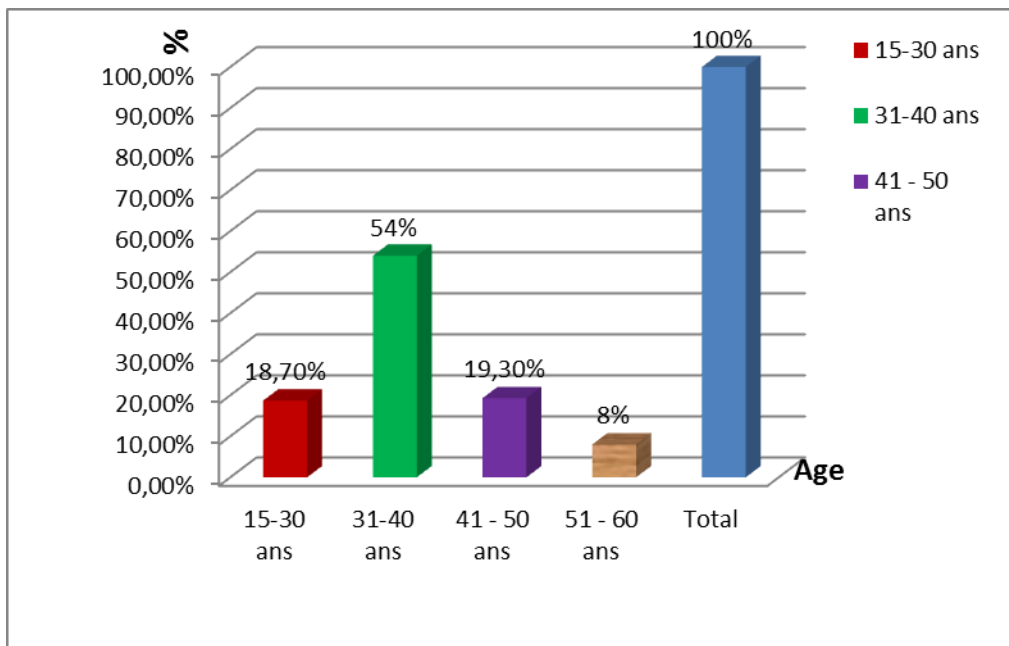
The understanding of this study required information on the gender and ages of the people who participated in the interview. Thus, Table 1 gives information on the human resource which is an essential value for this work.

**Table 6: Gender distribution of respondents for Administration (Survey, 2017)**

Gender	Effectiveness	%	Pourcentage
Female	90	60%	60%
Male	60	40%	100%
Total	150	100%	

Data collection resulted in the recording of 60% of women versus 40% of men participating in the survey. This can explain the importance that each and every one bear on the realization of scientific research.

In addition, the characteristics of the administrative staff include the age category (Figure 1).

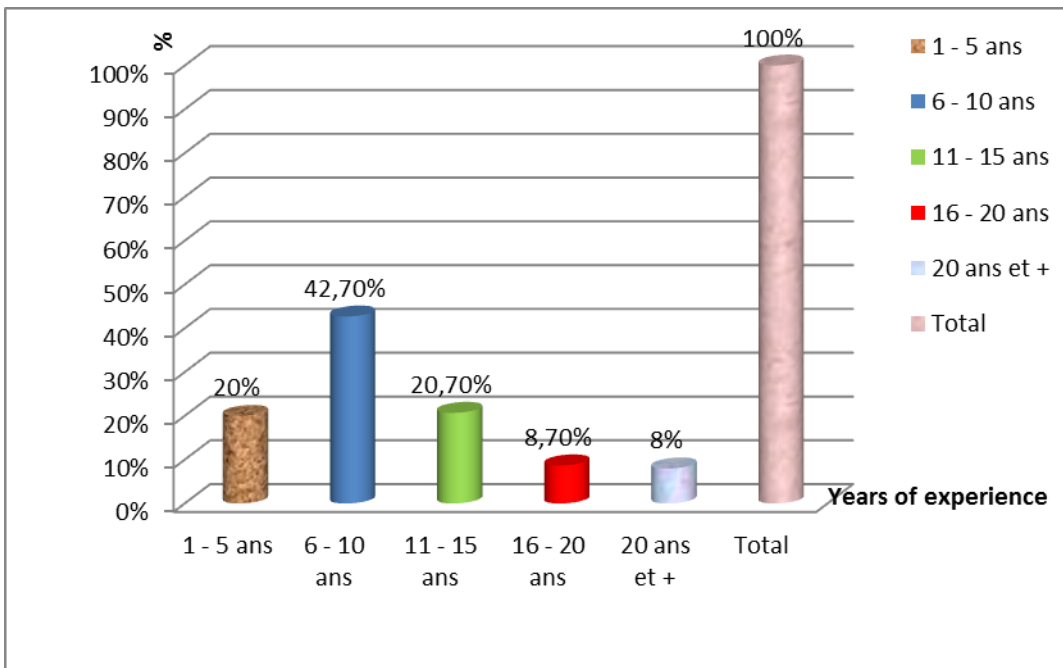


**Figure 8: Age distribution of respondents**

This figure shows that age is an important indicator for good decision-making in this study. In general, the data collection allowed to record 18.70% of the respondents who are in the age group between 15 and 30 years. In the 31 to 40 age group, 54% participated in the survey. All other age groups follow the same procedure in this study.

#### **IV.1.1.2. Breakdown by years of respondents' experiences**

In school, experience is a practice that allows you to acquire a knowledge or a knowledge of life over time. Figure 2 shows the level of experience of school staff based on seniority at the position.



**Figure 9: Years of experience**

This figure gives the information on the number of years in education. It appears that 20% of the staff of the institution who took part in the survey have between 1 and 5 years of experience while 42.70% have between 6 to 10 years of experience in the field. In addition, 20.70% of the people who participated in the survey are between 11 and 15 years old. This allowed to know the level of experience of those who contributed to the collection of useful information for this study.

#### **IV.1.2. Position held within the institution**

In a school, there is the administrative staff and the teaching staff. The table allows to know the different positions held by these staff.

**Table 7: Distribution of positions within the institution**

	Effectiveness	Frequency	Frequence accumulated
Administration	41	27,3%	27,30%
Teaching	109	72,7%	100%
Total	150	100%	

According to this survey, 27.30% of the staff hold administrative posts compared with 72.70% for teaching.

### IV.1.3. Possession of a computer in the office

ICT tools are needed in schools for different uses of staff. Thus, having a tool for integrating ICT into the education system facilitates the interaction between machines and humans. The table shows the level of computer ownership within the institution.

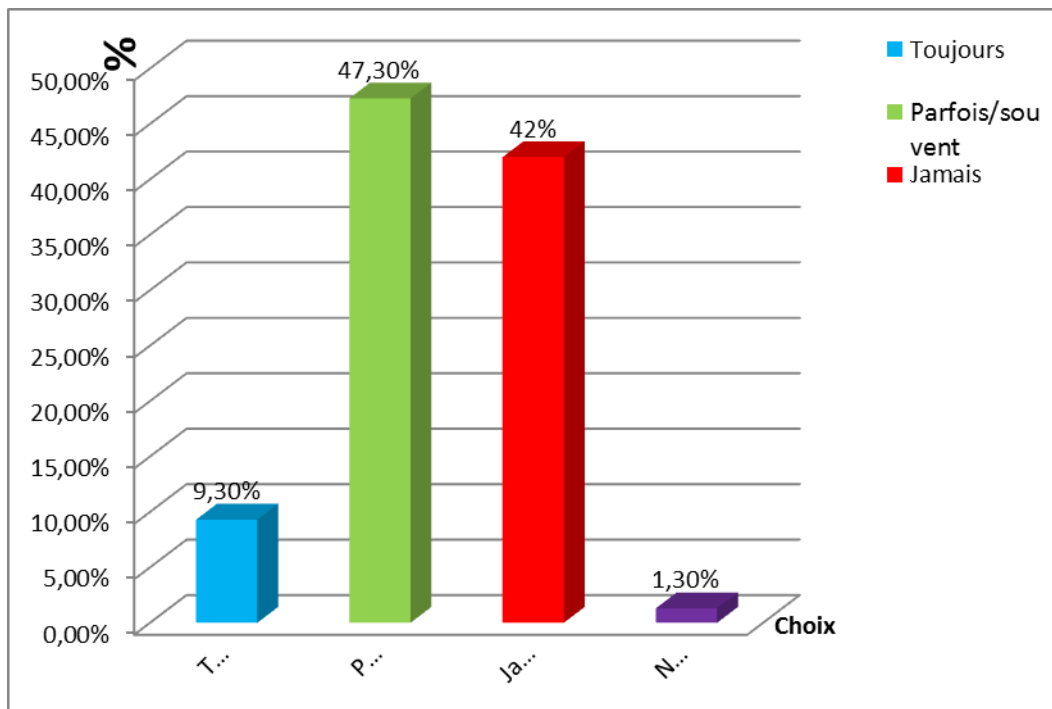
**Table 8: Computer Possession at the Office**

	Effectiveness	Frequency	Frequence accumulated
Yes	41	27,30%	27,30%
No	109	72,70%	100%
Total	150	100%	

It is found that within the institution, 27.30% of respondents have a computer in the office against an overwhelming majority of 72.70% say they do not have a computer.

### IV.1.4. Frequency of ICT use

The use of ICT in education is a willingness of teachers to meet the quality requirements of its education system and modernization of the administration. Thus, the figure shows the frequency of use of computers.



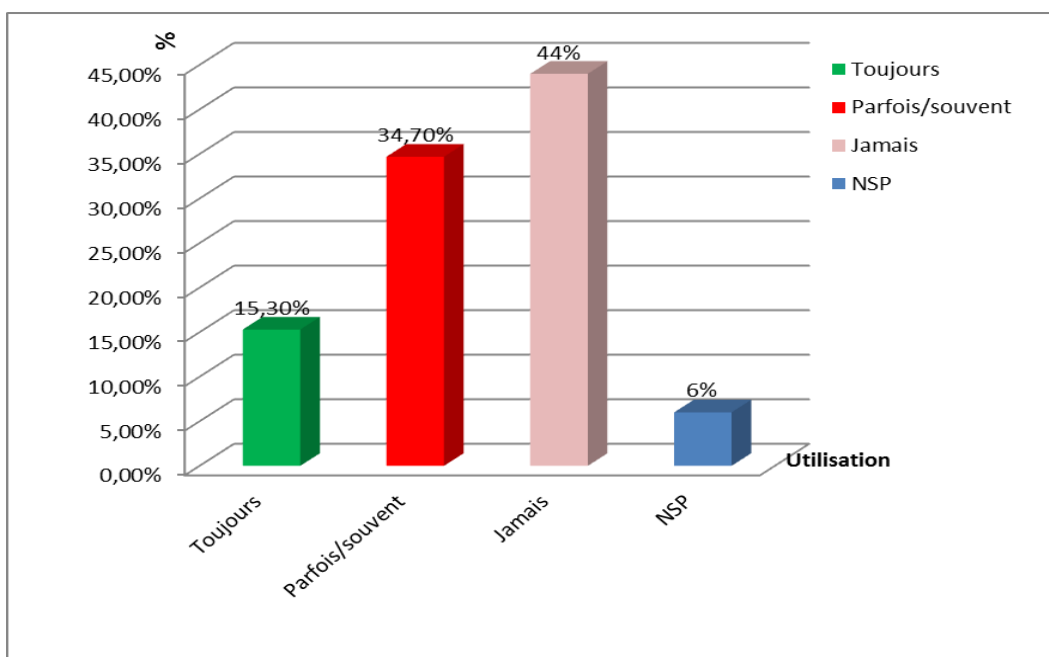
**Figure 10: Frequency of Use**

The survey shows that nearly 47.30% of the staff sometimes and often use ICT in the school environment against 9.30% who do it regularly. In addition, 42% of the population served never used these ICTs in an educational institution.

## IV.1.2. Different uses of ICT in schools

### IV.1.2.1. Database design of staff and students

Central databases (BDD) group and store data. The archiving, search and analysis tools enable them to use the information contained in these databases and the interface tools facilitate the connection between different databases or applications. The realization of a database implies that the headings are the same in order to homogenize the presentation of the different disciplines for the entire institution. For example, Figure 4 illustrates how often ICTs are used to create databases of staff and students.



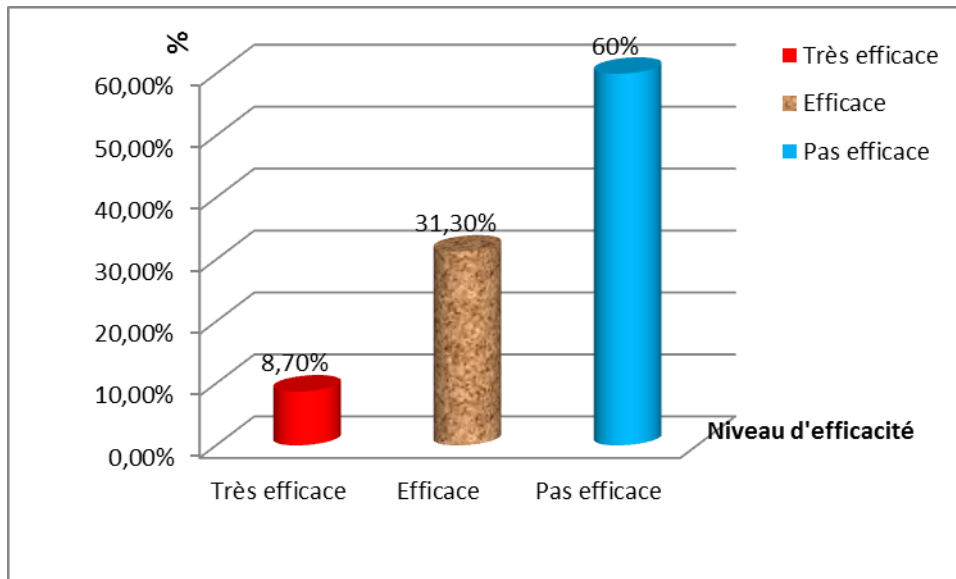
**Figure 11: Use of ICTs to build staff and student databases**

Figure 11 shows the results obtained from a perception survey of facility staff. In this high school, 15.30% of the surveyed population recognize to always use the tools of TIC for the preparation of the databases. In addition, there is 34.70% of the staff in this structure who sometimes or often use these ICT tools to create databases against 44% who never do.

### IV.1.2.2. Establishment of Time Tables

In school, the establishment of time is a key document in the management and development of lessons. This document summarizes the different movements of the teaching day in the classrooms and the different recreation breaks. Figure 5 gives the different opinions on the degree of effectiveness of ICT in the establishment of time jobs.



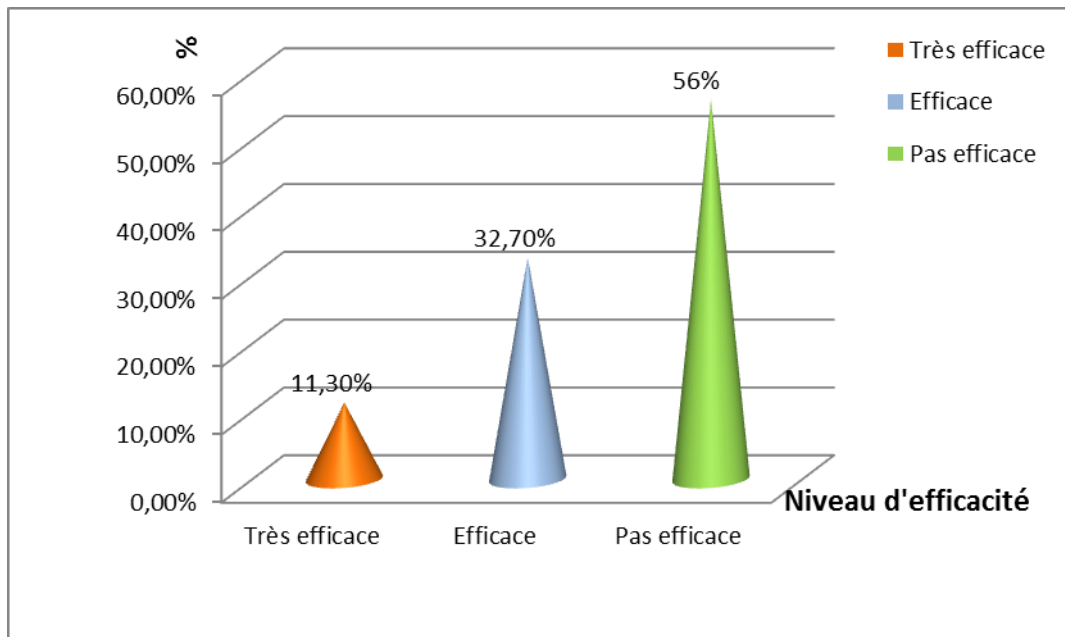


**Figure 12: Effectiveness of ICTs in Time Tables Establishment**

In this school structure, 8.70% of the surveyed staff found that the use of ICT is very effective in establishing time jobs whereas 31.30% think that ICT use is effective for job creation. of time. On the other hand, others point out that they do not perceive the effectiveness of ICTs in this administrative task.

#### **IV.1.2.3. Effectiveness of ICT in the preparation of exams**

The examination is a test designed to assess the knowledge and skills of one or more students. Subjects to be submitted to the students or candidates are handed over to the Pedagogical Officer to organize the schedule for the different disciplines. With ICT, censors create databases to better secure events for the purpose to avoid the escape of subjects who are confidential before the day of composition. Figure 6 illustrates the different opinions collected from the target population.



**Figure 13: Effectiveness of ICT in the preparation of exams**

It emerges from this figure that 11.30% of respondents point out that administrative management in exams is very effective and 32.70% of them state that the use of ICT in administrative procedures plays a key role for the securing examination papers. On the other hand, 56% of administrative staff responsible for pedagogy believe that the use of ICT is not effective in the preparation of exams.

#### IV.1.2.4. Use of ICT in exam management

Assessment of a student's knowledge and skills is important for the school curriculum. Exam management requires the preparation of tests, the schedule and the staff. As such, it consists of knowing the level of use of ICT in exam management (Table 4).

**Table 9: Use of ICT in Exam Management**

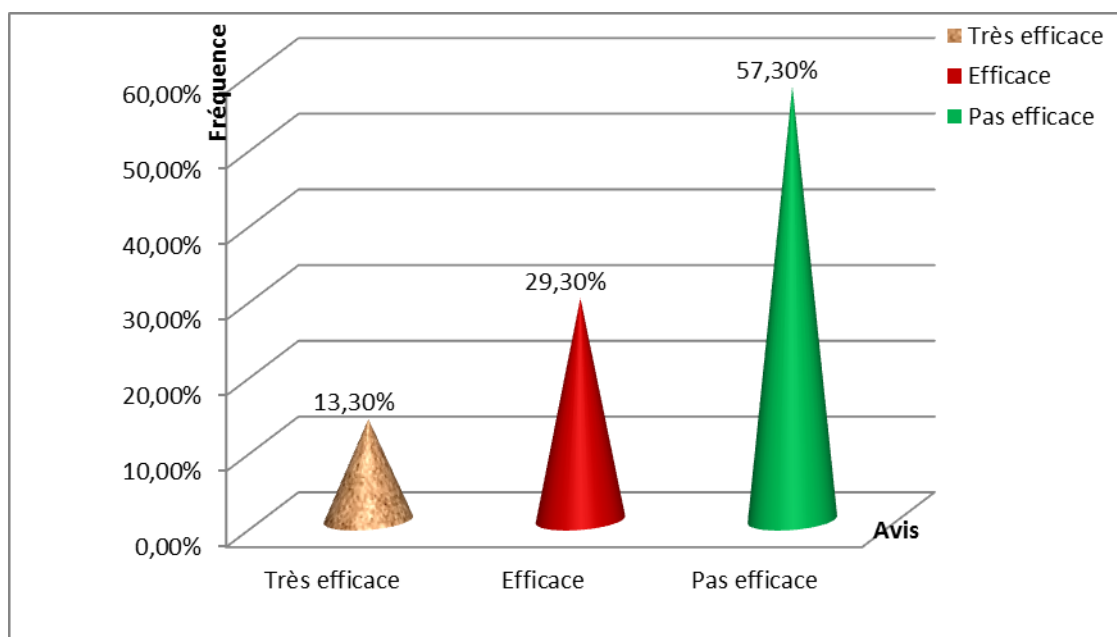
	Effectiveness	Frequency	Frequence cumulated
Very effective	15	10%	10%
Effective	49	32,70%	42,70%
Not effective	86	57,30%	100%
Total	150	100%	

This table shows that 10% of those surveyed stress that the use of ICT in exam management is very effective and 32.70% of them say that this use is rather effective.

From another angle, it appears that 57.30% of these think that the use of ICT in exam management is not effective.

#### IV.1.2.5. Effectiveness of ICT in designing progress sheet

The progress sheet allows the administration to follow the different activities of a teacher in its evolution. With the advent of ICT, work becomes very easy for administrative tasks dedicated to staff. Figure 6 shows the level of ICT effectiveness in designing the progress sheet.



**Figure 14: ICT Effectiveness in the Designing of the Progress Sheet**

Figure 14 shows the results obtained as a result of a staff perception survey. In this school, 13.30% of the surveyed population recognize that the use of ICT is very effective in the design of the progress sheet while 29.30% of them think that this use of ICT is effective. The other respondents (57.30%) strongly indicate that the use of ICT is not effective for the development of a progress sheet.

#### IV.1.2.6. Designing of educational reports

ICTs help teachers to design pedagogical reports on student score statistics and course progress. The table reveals the level of ICT effectiveness in the design of educational reports.

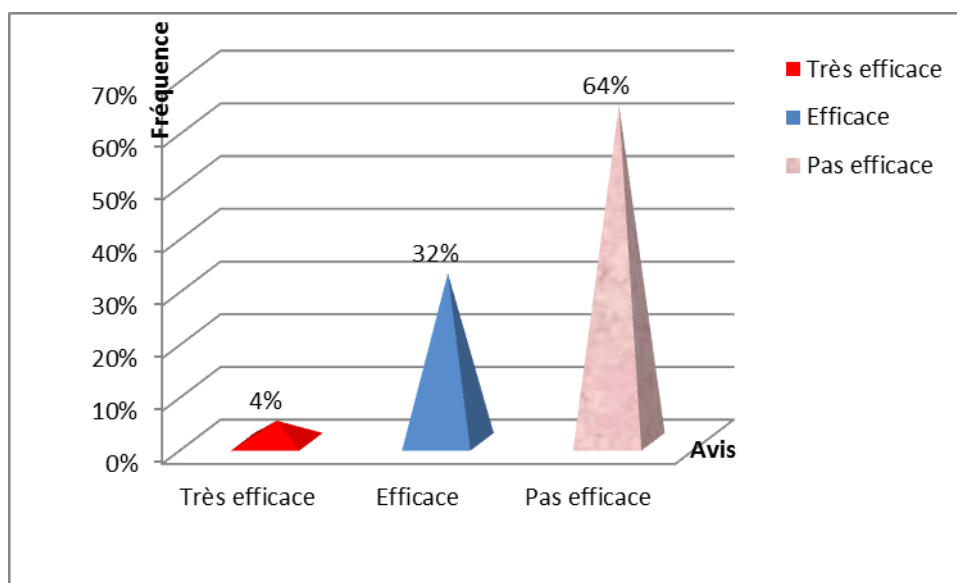
**Table 10: Effectiveness of ICT in Pedagogical Reporting**

	Effectiveness	Fréquence	Fréquence cumulée
Very effective	17	11,30%	11,30%
Effective	49	32,70%	44%
Not effective	84	56%	100%
Total	150	100%	

According to the survey, 11.30% of some respondents think that the use of ICT is very effective in the design of educational reports while 32.70% of them indicate that this job is effective. However, 56% of these respondents state that the use of ICT is not effective in the design of educational reports.

**IV.1.2.7. Effectiveness of ICTs to ensure discipline**

Discipline is based on a set of rules common to all members of a body or community. It is also the respect of the rules common to all members of the group. Thus, the administration of a school is very firm on the discipline. In addition, the application of ICTs ensures quality discipline (Figure 15).

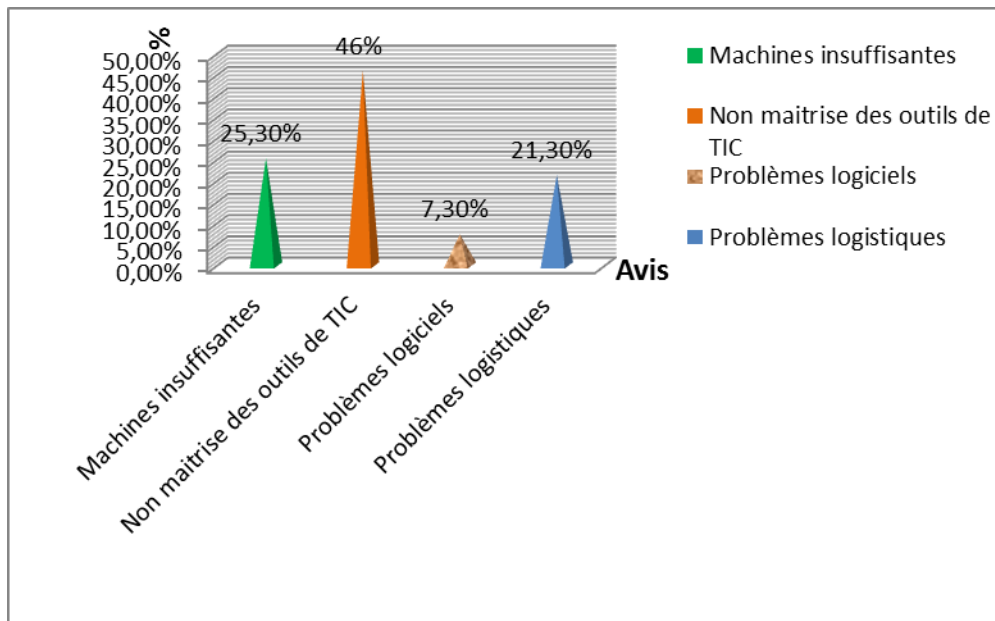


**Figure 15: Effectiveness of ICTs to Ensure Discipline**

According to the study conducted, 4% of respondents pointed out that the application of ICT is very effective in providing information about the discipline within the school. Similarly, 32% say that ICT use is indeed effective while an overwhelming 64% confirm that ICT use is not effective for monitoring the discipline.

#### IV.1.2.8. Difficulties encountered in the use of ICT in administrative procedures

The material conditions in which the school is located are of great importance for the effective use of ICT in administrative procedures despite the obstacles that present themselves. The administrative and pedagogical management activities contribute to developing the technological skills of the administrative staff, but the logistical and software problems, the insufficiency and the lack of mastery of the ICT tools are presented (figure 16).



**Figure 16: Limitations of ICT in School administration**

According to the survey, the administrative staff of the high school face enormous difficulties in applying ICT in administrative procedures. This figure shows that 25.30% of the administrative staff have a crucial problem related to the insufficiency of the machine positions, 46% think of the non mastery of ICT tools, 7.30% of the staff in terms of software and 21.30% of these staff find problems with logistics. This slows down the effectiveness of ICTs within the school administration.

This means that existing computers are reserved for some of the staff and the effectiveness of ICT in administrative procedures is not fully visible. In addition, the mastery of computer tools is a major asset for the staff who uses them but it is a big problem because the manipulation of these ICT tools is not obvious for a certain number of people in our school administrations. However, the problem of logistics is the one that is

the source of non-use of ICT tools in the administrations, without logistics everything else is doomed to failure.

In addition, the problem of software comes in two forms: the first form is based on the acquisition of full or genuine software and the second is the way to use it. It is also what can reduce the efficiency of the use of ICT in administrative procedures within schools. After presenting these results, it consists of moving to analysis and interpretation based on the cross-tabulations.

## IV.2. ANALYSIS OF ICT EFFECTIVENESS IN ADMINISTRATIVE PROCEDURES

This part consists of analyzing and interpreting data from the survey conducted among the staff of Etoug Ebe bilingual school.

### IV.2.1. Gender of respondent \* Effectiveness of ICT in administrative procedures

The survey allows us to appreciate the involvement of gender in the application of ICT in administrative procedures within schools. Thus, it should be noted sex is an important indicator in the choice of respondents (table).

**Table 11: Gender of respondent \* Effectiveness of ICT in administrative procedures**

			Effectiveness of ICT in administrative procedures				Total
			Weak	Average	Good	Very Good	
Gender	Female	Effectiveness	18	26	18	28	90
		%	20%	28,9%	20%	31,1%	100%
Gender	Male	Effectiveness	15	13	17	15	60
		%	25%	21,7%	28,3%	25,0%	100%
Total		Effectiveness	33	39	35	43	150
		%	22%	26%	23,3%	28,7%	100%

This table shows that 20% of women surveyed indicate low ICT efficiency in administrative procedures, 28.90% saw an average level of ICT efficiency in administrative procedures, 20% saw a good level of ICT efficiency in administrative procedures, 31.10% saw a very good level of ICT efficiency in administrative procedures. For our male respondents, that is, 25% say that the level of ICT efficiency is low in

administrative procedures, 21.70% report an average level of ICT efficiency in administrative procedures, 28.30% state that 'a good level of ICT efficiency in administrative procedures, only 25% say that there is a very good level of ICT efficiency in administrative procedures.

**Table 12 : Chi-square tests**

	Value	ddl	Signification (bilaterale)
Pearson's Chi- squareTest	2,672 <sup>a</sup>	3	,445
Report of Ressemblance lineaire Association	2,671 ,225	3 1	,445 ,635
Number of Valide observations	150		

It can be seen from this table that the chi-square value that emerges from the intersection of the variables "Sex" and "Efficiency of ICT in administrative procedures" is 2,672 at 3 degrees of freedom and a significance of 0.445 greater than 0.05, our threshold of significance. This allows us to accept the sub-sample dependency hypothesis. Thus, it can be deduced that there is no significant difference from each other at the 0.05 level.

#### IV.2.2. Age of respondent \* Effectiveness of ICT in administrative procedures

Knowledge of the age of the respondent provides insight into the effectiveness of ICT in the administrative procedures of the different tasks within the school. As such, the table summarizes the points of view of the latter.

**Table 13: Age of respondent \* Effectiveness of ICT in administrative procedures**

			Effectiveness of ICT in administrative procedures				Total
			Weak	Average	Good	Very Good	
Respondents age	15-30 yrs	Effectiveness	3	6	7	12	28
		%	10,7%	21,4%	25,0%	42,9%	100%
	31-40 yrs	Effectiveness	24	24	17	16	81
		%	29,6%	29,6%	21%	19,8%	100%
	41- 50 yrs	Effectiveness	3	8	8	10	29
		%	10,3%	27,6%	27,6%	34,5%	100%
	51- 60 yrs	Effectiveness	3	1	3	5	12
		%	25,0%	8,3%	25%	41,7%	100%
	Total	Effectiveness	33	39	35	43	150
		%	22,0%	26,0%	23,3%	28,7%	100%

This table shows that at different levels, the majority, ie 42.90% of our respondents between the ages of 15 and 30, state that a very good level of ICT efficiency in administrative procedures, 29.60% of between them aged 31 to 40 point out that there are both low and medium levels of ICT efficiency in administrative procedures. In addition, 27.60% of respondents aged 41 to 50 find that the level is very good for the effectiveness of ICT in administrative procedures.

**Table 14: Chi-square tests**

	Value	ddl	Signification (bilaterale)
Pearson's Chi-square test	13,433 <sup>a</sup>	9	,144
Report of Ressemblance	14,462	9	,107
Linaire Association	,043	1	,836
Number of Valide observations	150		

The chi-square value derived from the cross-tabulation of the respondent's age and ICT effectiveness variables in administrative procedures is 13.433 to 9 degrees of freedom and a significance 0.144 to greater than 0.05 of the significance threshold. This makes it possible to assert the hypothesis of dependence of the subsamples. It should be inferred that there is a significant difference in the effectiveness of ICTs in the administrative procedures of each other according to their ages.

#### IV.2.3. Age of respondent \* Frequency of ICT usage

**Table 15: Age of respondent \* Frequency of ICT usage**

			Q7 Frequent use of ICT				Total
			Always	Attimes	Never	NSP	
Q1 Respondents age	15-30 yrs	Effective ness	2	10	14	2	28
		%	7,1%	35,7%	50,0%	7,1%	100,0%
	31-40 yrs	Effective ness	6	41	34	0	81
		%	7,4%	50,6%	42,0%	0,0%	100,0%
	41 - 50 yrs	Effective ness	3	14	12	0	29
		%	10,3%	48,3%	41,4%	0,0%	100,0%
	51 - 60 yrs	Effective ness	3	6	3	0	12
		%	25,0%	50,0%	25,0%	0,0%	100,0%
	Total	Effective ness	14	71	63	2	150
		%	9,3%	47,3%	42,0%	1,3%	100,0%



It can be seen from this table that, to varying degrees, the majority, ie 50% of our respondents between the ages of 15 and 30, claim never to use ICT for administrative tasks, compared to 50.60% of them from 31 to 40 years who sometimes attend ICT in administrative procedures. In addition, 48.30% of 41-50 year-olds sometimes / often use ICT for administrative tasks compared to 50% of respondents aged 51-60.

**Table 16: Chi-square tests**

	Value	ddl	Signification (bilaterale)
Pearson's Chi-square test	14,629 <sup>a</sup>	9	,102
Report of Ressemblance	11,848	9	,222
Linaire Association	7,523	1	,006
Number of Valide observations	150		

The chi-square value statistic derived from the cross between the Respondent's Age and Frequency of Use variables which is 14.629 to 9 degrees of freedom and a significance of 0.102. For a risk  $\alpha = 5\%$ , the rejection threshold of the test is 3.33. Since the calculated value is greater than this threshold, the null hypothesis is rejected and it can be assumed that the respondent's age significantly influences the frequency of use.

#### IV.2..4. Gender of respondent \* Frequency of ICT use

**Table 17: Gender of respondent \* Frequency of ICT use**

			Q7 Frequent use of ICT				Total
			Always	Attimes	Never	No idea	
Gender	Female	Effectiveness	8	40	41	1	90
		%	8,9%	44,4%	45,6%	1,1%	100,0%
	Male	Effectiveness	6	31	22	1	60
		%	10,0%	51,7%	36,7%	1,7%	100,0%
Total		Effectiveness	14	71	63	2	150
		%	9,3%	47,3%	42,0%	1,3%	100,0%

Reading this table, we can see that: 8.90% of female respondents and 10% of male respondents use Always ICT tools while 44.40% of male respondents and 51.70% of male respondents Female respondents sometimes or often use ICT tools. In addition, it is found that the majority of respondents, 45.60% women and 36.70% men never attended the use of ICT.

This table allows us to note that generally, it is the women who attend ICT less than men for the daily tasks at the school

Table 18: Chi-square tests

	Value	ddl	Signification (bilaterale)
Pearson's Chi-square test	1,205 <sup>a</sup>	3	,752
Report of Ressemblance	1,210	3	,751
Linaire Association	,135	1	,713
Number of Valide observations	150		

The chi-square value statistic derived from the cross between the respondent's sex variables and Frequency of Use gives 1.205 at 3 degrees of freedom and a significance of 0.752. For this purpose, for a risk  $\alpha = 5\%$ , the rejection threshold of the test is 0.35264. The calculated value being greater than this threshold then the null hypothesis is rejected and one can admit that the sex of the respondent depends significantly on the frequency of use.

#### IV.2.5. Gender of respondent \* Level of ICT effectiveness to ensure discipline

Reading this table, we can see that: 56.20% of the female respondents think that the use of ICT is effective to ensure discipline and 63.50% of them say that this job is not effective. In addition, 66.70% of male respondents stated that the use is very effective.

Table 19: Gender of respondent \* Level of ICT effectiveness to ensure discipline

			Effectiveness of ICT to ensure discipline			Total
			Very Effective	Effective	Not Effective	
Gender	Female	Effective	2	27	61	90
		% Sexe	2,2%	30,0%	67,8%	100%
		% discipline	33,3%	56,2%	63,5%	60%
	Male	Effective	4	21	35	60
		% Sexe	6,7%	35,0%	58,3%	100%
		% discipline	66,7%	43,8%	36,5%	40%
Total	Effective	6	48	96	150	
	% Sexe	4,0%	32%	64%	100%	
	% discipline	100%	100%	100%	100%	

This table allows us to note that generally, it is the variable sex impact on the discipline within the establishment.

**Table 20: Chi-Square Tests**

	Valeur	ddl	Signification (bilaterale)
Pearson's Chi-square test	2,561 <sup>a</sup>	2	,278
Report of Ressemblance	2,521	2	,283
Linaire Association	2,156	1	,142
Number of Valide observations	150		

a. 2 cells (33.3%) have a theoretical size less than 5. The minimum theoretical size is 2.40.

This table allows us to note that the Chi-square value resulting from the cross between the gender variables of the respondent and the degree of effectiveness of ICT to ensure discipline is 2.561 to 2 degrees of freedom and a significance of 0.278 greater than 0.05. threshold of significance. This allows us to say that Respondent Sex significantly influences the degree of ICT effectiveness to ensure discipline within the school.

#### IV.2.6. Age of respondent \* Level of effectiveness of ICT to ensure discipline

Age is an important indicator for ensuring discipline within an institution. The discipline applies to both staff and students in order to harmonize the proper functioning of school structures.

**Table 21: Age of respondent \* Level of ICT effectiveness to ensure discipline**

		Q16 Degré d'efficacité des TIC pour assurer discipline			Total	
		Very Effective	Effective	Not Effective		
Q1 Age of respondents	15-30 yrs	Effective	0	7	21	28
		% Age of respondent	0%	25,0%	75,0%	100%
	31-40 yrs	% discipline	0%	14,6%	21,9%	18,7%
		Effective	1	27	53	81
	41 - 50 yrs	% Age of respondent	1,2%	33,3%	65,4%	100%
		% discipline	16,7%	56,2%	55,2%	54,0%
	51 - 60 yrs	Effective	3	10	16	29
		% Age of respondent	10,3%	34,5%	55,2%	100%
	Total	% discipline	50%	20,8%	16,7%	19,3%
		Effective	2	4	6	12
		% Age of respondent	16,7%	33,3%	50,0%	100%
		% discipline	33,3%	8,3%	6,2%	8%
	Effective	6	48	96	150	
	% Age of respondent	4,0%	32,0%	64%	100%	
	% discipline	100%	100%	100%	100%	

It can be seen from this table that to varying degrees, the majority, 75% of our respondents aged between 15 and 30 and 65.40% of those aged 31 to 40, say that the use of ICT is not effective in performing administrative tasks related to the discipline. In addition, 50% of respondents aged 41 to 50 think that the use of ICTs makes it possible to very effectively ensure discipline for administrative tasks compared to 33.30% of respondents aged between 51 and 60 years old.

**Table 22: Chi-Square Tests**

	Value	ddl	Signification (bilaterale)
Pearson's Chi-square test	12,213 <sup>a</sup>	6	,057
Report of Ressemblance	10,923	6	,091
Linaire Association	6,927	1	,008
Number of Valide observations	150		

This table shows that the Chi-square value resulting from the crossover between the Respondent's Age and the ICT Efficiency Grade variables to ensure discipline is 12,213 to 6 degrees of freedom and a significance of 0.057 greater than 0.05 threshold of significance. This leads us to confirm that the age of the respondent significantly influences the degree of effectiveness of ICT to ensure discipline within the school.

#### **IV.2.7. Effectiveness of ICT in administrative procedures \* Degree of effectiveness of ICTs in establishing time tables**

The 1<sup>st</sup> hypothese: Effectiveness of ICT permits the preparation of pedagogical duties like school time table, lessons sheet progressions, school calendar activities and marks management processes in school administration

In a school, the use of time is a sheet or table giving a program of activities or an organized program that breaks down the work to be done into elementary tasks. The organization of the old-fashioned time-use took a long time to establish and distribute to teachers of different disciplines. Thanks to the tutorials or administrative management software, the use of ICT by the administrative staff makes it possible to better organize teachers' time slots across all the disciplines to be taught (table).

**Table 23: Effectiveness of ICT in administrative procedures \* Degree of effectiveness of ICTs in establishing time tables**

			Q10 Degree of effectiveness of ICTs in establishing time tables			Total
			Very Effective	Effective	Not Effective	
Effectiveness of ICT in administrative procedures	Weak	Effective	7	6	20	33
		%	53,8%	12,8%	22,2%	22,0%
	Average	Effective	3	18	18	39
		%	23,1%	38,3%	20,0%	26,0%
	Good	Effective	1	11	23	35
		%	7,7%	23,4%	25,6%	23,3%
	Very Good	Effective	2	12	29	43
		%	15,4%	25,5%	32,2%	28,7%
	Total	Effective	13	47	90	150
		%	100,0%	100,0%	100,0%	100,0%

According to this survey, it appears that 53.80% of the administrative staff responsible for the establishment of time jobs find that the use of ICT for the implementation of time jobs is very efficient despite a low level of employment. within the school. For 38.30% of respondents, the efficiency of ICT in administrative procedures is at a medium and efficient level for establishing time jobs. However, at a very good level, 32.20% think that the effectiveness of ICT in administrative procedures is not effective for establishing time jobs.

**Table 24: Chi-Square Tests**

	Valeur	ddl	Signification asymptotique (bilatérale)
Pearson's Chi-square test	14,751 <sup>a</sup>	6	,022
Report of Ressemblance	13,729	6	,033
Linaire Association	3,960	1	,047
Number of Valide observations	150		
a. 4 cellules (33,3%) ont un effectif théorique inférieur à 5. L'effectif théorique minimum est de 2,86.			

Reading this table shows the intersection of the variables Efficiency of ICT in administrative procedures and Degree of effectiveness of ICT in the establishment of time jobs give a chi-square value of 14,751 to 6 degrees of freedom and a significance of 0.022 less than 0.05 our threshold of significance, we can reject the hypothesis of dependence of

sub-samples and thereby deduce that the effectiveness of ICT in administrative procedures influences the establishment of time jobs.

Based on the results obtained, the assumption that ICTs in the management of administrative procedures make it possible to better organize examination management within the institution. This assumption is confirmed at the significance level  $\alpha = 0.05$ . There is a dependency relationship between the use of ICT in administrative procedures and the management of examinations in schools.

#### **IV.2.8. Efficiency of ICT in administrative procedures \* Q16 Degree of effectiveness of ICTs in ensuring discipline**

The 2<sup>nd</sup> hypothese: Effectiveness of ICT assists the discipline department to better organize discipline in school administration.

School discipline is based on a set of practical procedures to ensure a good order of the exercises of all kinds which is made up of school life. In a regular setting, it is to the administration that the general by-laws relating to school discipline emanate, and it is to the heads of establishments that, in concert with the supervisors general, the regulation of detail. Thus, the table shows that ICTs play an important role in administrative procedures according to the degree of effectiveness in order to ensure discipline within the school. With the ICT tools, the hours of absence or delays of the pupils are counted automatically and this allows the administration to question the parents of pupils as well as the persons concerned. ICTs allow administrative staff to track students in their different behaviors to ensure good results for both passing exams and official exams.

**Table 25: Efficiency of ICT in administrative procedures \* Q16 Degree of effectiveness of ICTs in ensuring discipline**

			Effectiveness of ICT in ensuring discipline			Total
			Very Effective	Effective	Not Effective	
Effectiveness of ICT in Administrative Procedures	Weak	Effectiv	1	9	23	33
		%	16,7%	18,8%	24,0%	22,0%
	Average	Effectiv	1	20	18	39
		%	16,7%	41,7%	18,8%	26,0%
	Good	Effectiv	1	11	23	35
		%	16,7%	22,9%	24,0%	23,3%
Very good	Effectiv	3	8	32	43	
	%	50,0%	16,7%	33,3%	28,7%	
Total	Effectiv	6	48	96	150	
	%	100,0%	100,0%	100,0%	100,0%	

This table shows that the majority of our high school survey respondents, 50%, say the effectiveness of ICT in administrative procedures of a very good and very effective level to ensure discipline within this school. In addition, 41.70% of them point out that there is an average level of ICT effectiveness in administrative procedures to better organize and raise the different dimensions of the discipline.

On the other hand, 33.30% of the staff who use ICT in the administrative procedures do not find efficiency in the management of the discipline.

According to Gaillard (2017), the requirements of the discipline can not be exactly the same in an establishment in an urban area and in a school in a rural environment, in a high school that only includes a few classrooms and in a high school that count several.

**Table 26 : Chi-Square Tests**

	Valeur	ddl	Signification asymptotique (bilatérale)
Pearson's Chi-square test	11,375 <sup>a</sup>	6	,077
Report of Ressemblance	11,156	6	,084
Linaire Association	,446	1	,504
Number of Valide observations	150		

Based on the results obtained, the hypothesis that says: ICT in the management of administrative procedures makes it possible to better organize the discipline within the establishment. This assumption is confirmed at the significance level  $\alpha = 0.05$ . There is a dependency relationship between the use of ICT in administrative procedures and school discipline. It appears from this table that the value of the Chi-square resulting from the crossing of the variables Efficiency of ICT in administrative procedures and degree of effectiveness of ICT to ensure discipline among the staff of the High School is 11,375 to 6 degrees of freedom and a significance of 0.077 greater than 0.05, our threshold of significance. This makes it possible to assert the hypothesis of dependence of subsamples and hence to deduce that the effectiveness of ICT in administrative procedures depends on the degree of effectiveness of ICT to ensure discipline

#### **IV.2.9. Effectiveness of ICT in administrative procedures \* Degree of ICT use in exam management**

The 3<sup>rd</sup> hypothese: Effectiveness of ICT facilitates the follow up of teachers in their lessons preparation and conceiving evaluation questions in school administration

Exam management is planned in space and time. Thanks to computers, the school administration uses ICTs to ensure the smooth running and the draw of the tests. The table indicates that the management of the school exams passes by a good use of the computer tools which allows the administrative staff to record different copies under the anonymity in order to avoid fraud for both teachers and students.



**Table 27: Effectiveness of ICT in administrative procedures \* Degree of ICT use in exam management**

			Q11 Degree of ICT use in exam management			Total
			Very Effective	Effective	Not Effective	
Effectiveness of ICT in administrative procedures	Weak	Effectiv	8	12	13	33
		%	53,3%	24,5%	15,1%	22,0%
	Averag	Effectiv	4	16	19	39
		%	26,7%	32,7%	22,1%	26,0%
	Good	Effectiv	1	11	23	35
		%	6,7%	22,4%	26,7%	23,3%
Very Good	Effectiv	2	10	31	43	
	%	13,3%	20,4%	36,0%	28,7%	
Total		Effectiv	15	49	86	150
		%	100,0%	100,0%	100,0%	100,0%

This table shows that 53.30% of administrative staff responsible for exam management find that the effectiveness of ICT in administrative procedures using ICT for exam management is very effective despite a low level within the organization. school and 32.70% of respondents, the effectiveness of ICT in administrative procedures is at a medium and effective level for the management of exams. However, at a very good level, 36% believe that ICT effectiveness in administrative procedures is not effective for exam management. The use of ICT in combination with administrative procedures forms a remarkable cohesion in the management of examinations within a school.

**Table 28: Chi-Square Tests**

	Valeur	ddl	Signification asymptotique (bilatérale)
Pearson's Chi-square test	16,287 <sup>a</sup>	6	,012
Report of Ressemblance	15,555	6	,016
Linaire Association	13,051	1	,000
Number of Valide observations	150		

The chi-square value statistic derived from the cross-tabulation of ICT Efficiency in Administrative Procedures and Degree of ICT Use in Exam Management gives 12,287 at 6 degrees of freedom and a significance of 0.012. For this purpose, for a risk  $\alpha = 5\%$ , the rejection threshold of the test is 1.64. The calculated value being above this threshold then the null hypothesis is rejected and it can be assumed that the effectiveness of ICT in

administrative procedures significantly depends on the degree of use of ICT in exam management.

Based on the results obtained, the assumption that ICTs in the management of administrative procedures make it possible to better organizes examination management within the institution. This assumption is confirmed at the significance level  $\alpha = 0.05$ . There is a dependency relationship between the use of ICT in administrative procedures and the management of examinations in schools.

#### IV.2.10. Effectiveness of ICT in administrative procedures \* Degree of Effectiveness of ICT in the preparation of examination papers

The examination is a test designed to assess the knowledge and skills of one or more students. Subjects to be submitted to the students or candidates are handed over to the Pedagogical Officer to organize the schedule for the different disciplines. With ICT, censors create databases to better secure the proofs in order to avoid the leak of subjects that are confidential before the day of composition.

**Table 29: Efficiency of ICT in administrative procedures \* Degree of ICT efficiency in the preparation of examination papers**

			Q13 Degree of ICT efficiency in the preparation of examination papers			Total
			Very Effective	Effective	Not Effective	
Effectiveness of ICT in Administrative procedures	Weak	Effectiv	9	12	12	33
		%	52,9%	24,5%	14,3%	22%
	Averag	Effectiv	5	17	17	39
		%	29,4%	34,7%	20,2%	26,0%
	Good	Effectiv	1	10	24	35
		%	5,9%	20,4%	28,6%	23,3%
	Very Good	Effectiv	2	10	31	43
		%	11,8%	20,4%	36,9%	28,7%
Total		Effectiv	17	49	84	150
		%	100%	100%	100%	100%

This table shows that 52.90% of respondents state that the administrative management of exam preparation is very effective but at a low level and 34.70% of them say the use of ICT in administrative procedures plays an important role. a vital role in securing examinations. On the other hand, 36.90% of administrative staff responsible for pedagogy believe that the use of ICT is not effective in the preparation of exams.

**Table 30: Chi-Square Tests**

	Valeur	ddl	Signification asymptotique (bilatérale)
Pearson's Chi-square test	20,616 <sup>a</sup>	6	,002
Report of Ressemblance	20,129	6	,003
Linaire Association	16,662	1	,000
Number of Valide observations	150		

From this table it can be seen that the Chi-square value statistic derived from the cross-tabulation of ICT Efficiency in Administrative Procedures and ICT Efficiency Level for the Preparation of Examination Tests is 20.616 to 6 degrees of freedom. and a significance of 0.002. For  $\alpha = 0.05$  our threshold of significance, the value of the table is 1.64. Since the calculated value is greater than the value read from the table, this leads to the assertion of the sub-sample dependence hypothesis.

#### **IV.2.11. Effectiveness of ICT in administrative procedures \*Q8 Usage of ICT to conceive personnel and students records**

The 4<sup>th</sup> hypothese: Effectiveness of ICT helps to keep records of staff in school administration

In an institution, the confection of personnel and students records in relation to the safe garde of information is very essential. Thanks to the computer, school administration uses ICT tools to conceive records in order to obtain information concerning personnel and that of learners. The table shows that the record assembles all information about the school.

**Table 31: Effectiveness of ICT in administrative procedures \*Q8 Usage of ICT to conceive personnel and students records**

		Usage of ICT to conceive personnel and students records				Total	
		Always	At times	Never	I Don't know		
Effectiveness of ICT in administrative procedures	Effective	14	13	3	3	33	
	Weak	% interval in Effectiveness of ICT in administrative procedures	42,4%	39,4%	9,1%	9,1%	100,0%
	Average	Effective	5	21	12	1	39
		% interval in Effectiveness of ICT in administrative procedures	12,8%	53,8%	30,8%	2,6%	100,0%
	Good	Effective	1	12	19	3	35
		% interval in Effectiveness of ICT in administrative procedures	2,9%	34,3%	54,3%	8,6%	100,0%
	Very Good	Effective	3	6	32	2	43
	% interval in Effectiveness of ICT in administrative procedures	7,0%	14,0%	74,4%	4,7%	100,0%	
Total	Effective	23	52	66	9	150	
	% interval in Effectiveness of ICT in administrative procedures	15,3%	34,7%	44,0%	6,0%	100,0%	

The table shows that 15,3% of administrative staff in charge for the confection of staff and students records find that Effectiveness of ICT in administrative procedures are for the safe garde of information in school. There is equally 34,7% of respondents use ICT at times for the confection of records. But instead, 44,0% of the respondents never had the experience in using computers to conceive records.

The usage of ICT in conformity with administrative procedures forms a remarkable cohesion in the confection of records in school.

**Table 32: Chi-Square Tests**

	Valeur	dd	Signification asymptotique (bilatérale)
Pearson's Chi-square test	53,526 <sup>a</sup>	9	,000
Report of Ressemblance	54,737	9	,000
Linaire Association	4,848	1	,028
Number of Valide observations	150		

a. 4 cellules (25,0%) ont un effectif théorique inférieur à 5. L'effectif théorique minimum est de 1,98.

The statistics from the cross value between variables from the Effectiveness of ICT in administrative procedures and the usage of ICT in the confection of staff and students record give 53,526 at 9 degree of liberty. To this effect at a risk of  $\alpha = 5\%$ , the rejected scale is equal to 3,33. The calculated value is superior to this scale, hence the null hypothesis is rejected and one can admit that the effectiveness of ICT in administrative procedures depends significantly on the usage of ICT in the confection of staff and students records.

Taking into consideration the obtained results, the hypothesis that states: ICT in administrative procedures permits to better organize the management of exams in school. This hypothesis is confirmed at the signification rate of  $\alpha = 0,05$ . There exist a dependence relationship between the effectiveness of ICT in administrative procedures and the usage of ICT in the confection of staff and students records in school milieu.

### **IV.3. Discussion on the effectiveness of ICTs in administrative procedures**

From the observation of the tables and graphs above, it appears that the uses of ICT in the school environment produce effects whose importance for the educational communities is absolute or relative according to their nature.

#### **IV.3.1. Possession of a computer in the office**

The possession of a desktop computer within the institution encourages administrative staff in the management of daily tasks. Thus, having a tool for integrating ICT into the education system facilitates the interaction between machines and humans. Administrative staff use ICT tools for personal purposes only for administrative tasks. The possession of information and communication technology (ICT) tools plays a vital role in supporting strong and effective management and administration in the education sector. It is stated that the technology can be used directly at various resource administrations in an educational institution.

### **IV.3.2. Use of ICTs to build staff and student databases**

In the school setting, the database includes school records (books, documents, files and CD-ROMs) containing information about what is happening in an institution (eg school activities, non-school activities and important events and other relevant information). School records are official transcripts or copies of deeds, events, other topics kept by the head teacher. These school records may be considered authentic records or instruments or documents of the official transaction or event accounts kept in the office of the institution. Through IT, ICT has enabled the head teacher to set up a homogeneous database representing the different disciplines for the entire school. In addition, the use of ICT within the school is leading administrative staff to build databases of staff and students. Therefore, each institution must maintain certain specified information.

Thus, the use of software or applications to facilitate the accomplishment of these tasks will be daily as long as the training is adequate and computers are sufficient, powerful enough, well located or made mobile in some cases. Guidotti et al. (1996) point out that these applications will place the administrative staff in a situation of true technological appropriation because they aim at mastering an environment, competence necessary for the harmonious integration of the TIC in the administrative procedures. They will also enable continuous improvement of ICT management and evaluation tools by facilitating their renewal and increasing the quality of the tasks to be performed.

### **IV.3.3. Efficiency of ICT in the establishment of time jobs**

Administrative staff have great difficulty in establishing school time jobs of every grade or level. For this purpose the challenge of ICT in schools brings improvements in administrative procedures by establishing the schedule in a very short time. The effectiveness of ICT in this administrative task is proven in the school structure if the integration of ICT as Maurer and Davidson (1998) insist on management, promotes a community-based learning approach. According to Owens (1998), the support offered by key administrators at the school board and school levels is in fact one of the most significant success factors. Thus, the successful implementation of an innovation in schools would depend, among other things, on the ability of school leaders to put in place certain conditions to support teachers. Owens warns school leaders against falsely participatory management. Indeed, given the enthusiasm for this approach in human

resources management, some would be tempted to practice a semblance of participatory management, which would lead to the failure of organizational development projects.

#### **IV.3.4. Effectiveness of ICT in the preparation of exams**

The use of ICT allows pedagogical managers to create databases to better secure the proofs and avoid the leakage of subjects that must remain confidential before the day of composition. In addition, the data indicate that the more respondents claim to make pedagogical use of ICTs, the more they feel that ICTs contribute to increasing their effectiveness and that the formation of a committee of experts would facilitate the pedagogical integration of ICTs. at school. Also, the more respondents make pedagogical use of ICT, the more they would like to receive training on the pedagogical use of ICT.

#### **IV.3.5. Effectiveness of ICTs to ensure discipline**

The supervisor is an educational staff whose missions are available to students at all times when they are in the school. Formally, in addition to writing tasks (registration of absences, delivery of school plays such as entrance tickets, etc.), the function of the supervisor is, in particular, to ensure the maintenance of discipline, which "relates to a complex system of dynamic and functional balances between the acts of the various subjects of the institution "(Alfredo Furlun, 1998). Its working guide is the rules of procedure which contain the rules of conduct guaranteeing the order and the good conditions of life in community and that it has for mission to observe.

As part of this study, supervisors take part in the administrative tasks of managing absences and delays through ICT tools. Some tasks are dedicated to the knowledge of the proper functioning and organization of a school. To better ensure discipline, based on information about school discipline, mastery of basic computer tools and knowledge of application software is an advantage.

#### **IV.3.6. Brakes on the use of ICT in administration**

The administrative and pedagogical management activities contribute to developing the technological skills of the administrative staff but the logistical and software problems, the insufficiency and the lack of control of the ICT tools are presented. In other words, it is:

- non-mastery of the pedagogical use of ICTs and computer tools by the administrative teaching staff, which makes their use in the administration problematic;

- Computer hardware maintenance is also a problem because failures are not handled very quickly, making it difficult to use ICT in administrative procedures. Ignorance of heads of institutions who do not always know which software is suitable for better administrative management of the education system and do not fully master them.

Thus, it is difficult to change the habits and the ways of working, anchored for a long time. It should also be noted that there is a lack of motivation on the part of administrative staff and teachers who wonder why they are doing so much harm. In general, these results are consistent with many previous scientific studies that indicate that the lack or inadequacy of the technological infrastructure is at the top of the obstacles encountered in the use of ICT in education (WJ Pelgrum and N.Law 2004, OECD, 2001, Karsenti and Tchameni Ngamo, 2009).

In addition, more than 70% of respondents want training for the Use a Spreadsheet item to make calculations and solve problems. These data partially corroborate the results of the study by Isabelle et al. (2002) who point out that principals claim to be more or less able to help teachers use the various software packages, particularly a spreadsheet. In fact, if the director feels they are not good at manipulating this program, they can hardly help others to use it. This request to learn how to use the spreadsheet is not surprising. This data is consistent with studies that emphasize that since the mid-1990s, the school has been part of the new public management with accountability (St-Germain, 2001). School principals, for example, to facilitate the analysis of data during the drafting of improvement plans and the setting up of functioning in the professional learning community, are invited to use spreadsheets and databases. . It is very important to offer them as early as possible professional development focused specifically on the use of these programs to perform certain administrative tasks.

Of all this, the school administration is responsible for ensuring the smooth running of school services for all. It therefore seems obvious that the role of the school administration is becoming more and more complex. Innovation, renovation, qualification, should not be taken as mere words, as the principles announced such democratization of school management.



## **GENERAL CONCLUSION**

This general conclusion presents the summary of the findings, conclusions and recommendations based on the analysis of the use and effectiveness of ICT in school administrative processes in selected public secondary schools in Yaoundé, Cameroon.

### **1. Summary**

The main purpose of this study was to examine the use and effectiveness of ICT in school administrative processes in selected public secondary schools in Yaoundé, Cameroon. The objectives of the study sought to examine: the extent to which school administrators apply ICT in human resources administration, that is, through the establishment of time tables, the application of ICT in administration of physical resources, challenges facing administrators in the use of ICT in school administration and the measures that can be taken to improve the application of ICT.

This study employed a survey research design. Simple random sampling and purposive sampling procedures were used to arrive at the sample (Students, computer teachers, and the principals). In total the sample size was one hundred and thirty (n=130). However, from the analysis, one hundred and six of them participated in the study. The rest were unwilling to participate. Despite this the response rate was 81.5%. Questionnaires and interview guides were used to collect data from the teachers and Principals.

The collected data were analyzed using descriptive statistics, employing both quantitative and qualitative approaches. Data from questionnaires were purely analyzed quantitatively, and presented in frequencies and percentages while that which was collected through the interview method was analyzed qualitatively. They were synthesized to a presentable data and the key points emerging were reported in narrative form based on the key study themes. From the analysis, the following key findings were made:

### **2. Challenges facing the use and effectiveness of ICT in School Administrative procedures**

One of the major challenges that were stated by a good number of teachers 18 (17%) was illiteracy since the school didn't have adequate ICT facilities such as computers and internet connectivity to support its effective use in school administration. Additionally, 15.1% of the administrative staff also indicated that a major challenge that hindered the effective application of ICT in the school administration was lack of finance {financial constraints}.

Other major challenges as indicated by the staffs include but may not be limited to lack of adequate knowledge, out dated systems, insecurity and embezzlement of funds. moreover, they also reported that the key challenges which were affecting the effective use of ICT were lack of enough computers and their required components and facilities for functionality, lack of training on how to utilize the available facilities effectively and insecurity which in most cases were being brought about through system attacks by viruses due to lack of adequate protection software and devices. The key challenges that emerged as reported by the principals of the schools included limited facilities, financial constraints, poor linkages, poorly trained teachers on effective use of ICT in teaching and learning and lack of internet connectivity.

From the analysis, discussion and summary of the findings, the following conclusions can be made:

Most of the public secondary schools in Yaoundé have embraced ICT in their day to day activities. In terms of human resource administration, ICT is being applied in the areas of monitoring attendances, performance, staff training and recruiting of the staff. However, the application is not that effective due to various challenges such as power shortage and inadequate facilities hence rendering its use in the human resource administration to a small percentage. It may also be concluded that public secondary schools in Yaoundé do apply ICT in the administration of physical resources but to some extent. In terms of physical resources, ICT has been limited only to the monitoring of classroom facilities, advertisement of tenders, monitoring lab facilities and stationeries (text/exercise books).

However, it hasn't been fully applied in monitoring facilities such as kitchen and sports facilities. The school administrators in public secondary schools in Yaoundé apply ICT in financial administration in various ways. Some of the ways through which ICT is being applied in financial administration include but may not be limited to the following fees collection and salary payment. As such, the key individuals who are engaged in applying ICT in terms of financial administration include school principal and the accountants/ bursars respectively.

Effective use of ICT in school administrative procedures in public secondary schools in Yaoundé is being hindered by a number of challenges. The key challenges include but may not be limited to lack of facilities, poor training among key stakeholders, financial constraints and insecurity due to no security checkup software for the computers. These challenges have

made not only the school administrators but also the entire staff in the region not to be 100% effective in applying ICT in their day-to-day activities.

### **3. Recommendations**

#### **➤ Influence of ICT in the position occupied**

It has been found out that 49% of the administrative staff occupies post of responsibilities with computers. Unfortunately, 51% of staff does not have ICT tools in their offices. This is why they cannot cope with the new technology. To this end, it would be advisable for the administration of the institution to provide its administrative staff with computer tools that would permit them to re-enter the era of ICT.

#### **➤ Influence of ICT on the experience of administrative staff**

It was noted that ICT plays an important role to administrative staff in their daily tasks. This is why the staff is enthusiastic about the fact that it is between 16 and 20 years in the use of ICT in order to simplify the administrative and pedagogical work. Beyond 20 years, the effectiveness of ICTs is improving because the staff is becoming aging. However, it would be better to maintain the level of ICT use so that its effectiveness is always remarkable in order to simplify administrative and day-to-day tasks.

#### **➤ Possession of computers in office**

The possession of a computer in an office does not mean that the staff masters all the functionality or how to use ICT. As such, it would be a good idea for the administration to allow time for both administrative and teaching staff to be trained in the use of ICT. It is on the basis of all this that the effectiveness of ICT in administrative procedures would be truly visible.

#### **➤ Frequent use of ICT**

It is clear that administrative staff use ICT to carry out dedicated or assigned tasks. Efforts should be made in the frequency of ICT use. It is true that 71% of the staff do the same, but this should improve so that the efficiency of the use of ICT in administrative procedures can reach at least 90%. On the basis of this, the effectiveness of ICT would be better perceived in schools.

#### **➤ Building up data bases**

The advent of ICTs solves a problem of physical archives in schools by creating or rather building up databases to retain data for more than ten years. It was noted that 43.5% of the administrative staff always make databases while others do so from time to time and

sometimes never. It would be preferable for administrative staff to appropriately master ICTs in order to create bases and secure them as long as possible. This would further explain the effectiveness of ICTs in administrative procedures in school administrations.

#### **4. Recommendations for Further Studies**

A further study has to be done to investigate the impact of the use of Information Communication Technology on the performance of public secondary schools in Cameroon in general and in public Secondary Schools in Yaoundé in particular. Another study has to be carried out to examine factors affecting the effectiveness of Information Communication Technology in public Secondary Schools in Cameroon.

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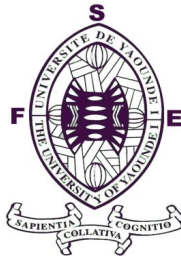


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## APPENDICES

**REPUBLIQUE DU  
CAMEROUN  
Université de Yaoundé I  
Faculté des Sciences de  
l'Éducation  
Département de management  
de l'éducation**



**REPUBLIC OF CAMEROON  
The University of Yaoundé I  
Faculty of Educational  
Sciences  
Department of educational  
management**

### RESEARCH QUESTIONNAIRE

Dear Respondents,

In partial fulfillment of the requirements for the award of a postgraduate Diploma in Sciences of Education, we are undertaking research on the topic **“EFFECTIVENESS OF ICT IN THE MANAGEMENT OF SCHOOL ADMINISTRATIVE PROCEDURES: THE CASE OF GOVERNMENT BILINGUAL HIGH SCHOOL ETOUG EBE YAOUNDE »**

Fellow respondents rest assured that the questionnaire is meant for the intended purpose and does not engage you in any way. The information provided will be treated in the greatest possible confidentiality and anonymity.

Please feel free to answer the questions by either marking a cross (X) or a (V) to the suggested answers.

Thank you

TANYI TAKU NELSON

**I. IDENTIFICATION OF RESPONDENTS (*identification du répondant*)**

Q1. Names.....

Q2. Age..... Date of Birth.....

Q3. Sex: 1) Female  2) Male

Q4. Occupied Post (**poste actuel**) .....

Q5. Level of Education: (*Niveau d'éducation*)

1) Primary  2) Secondary  3) University  4) None

Q6. Please indicate your highest Professional qualification: (*Quel est votre diplôme le plus élevé ?*) .....

Q7. Longevity in actual service (**durée au poste de service actuel**)

Propositions	1) 1-5 years	2) 6-10 years	3) 11-15 years	4) 16- 20 years	5) 20 +
Tick your choice					
Total					

**II. QUESTIONS**

Q8. Do you have a computer in your office? 1) YES  2) NO

(*Avez-vous un ordinateur dans votre bureau ?*)

Q9. How often do you use it? (**A quelle fréquence l'utilisez-vous?**)

Propositions	1) Always	2) AT TIMES	3) NEVER	4) I Don't Know
Tick your choice				
Total				

Q10. In your school, how often are ICT tools useful in the confection of personnel and students records?

(*Dans votre école, utilisez-vous les outils de TIC pour la confection des bases des données du personnel et des étudiants?*)

Propositions	1) Always	2) AT TIMES	3) NEVER	4) I Don't Know
Tick your choice				
Total				

Q10.1 If ALWAYS or AT TIMES, what are some difficulties you are confronted to when creating records? Please kindly propose some solutions. (*Si toujours ou souvent quelles sont les difficultés auxquelles vous êtes confrontés? Quelles solutions préconisez-vous?*)

.....  
 .....  
 .....  
 Q11. What are some challenges or problems you may be confronted to when using ICT tools? Please kindly propose some solutions. *(Quelles défis auxquels vous êtes confrontés dans l'utilisation des TIC? Proposez quelques solutions?)*

.....  
 .....  
 .....

Q12. How effective is the application of ICT in the confection of school time table? **(Quel est le degré d'efficacité des TIC pour l'établissement de l'emploi de temps votre école?)**

.....  
 .....

Q13. How often do ICT tools help in the management of school examinations? *(A votre avis, est ce quel est le degré d'usage des TIC dans la gestion des examens?)*

Propositions	1) Very Effective	2) Effective	3) Not Effective
Tick your choice			
Total			

Q14. If NOT EFFECTIVE, what can be some major problems you are confronted in the usage of ICT tools for managing school examination? Please propose some solution to these problems. *(Si c'est pas le efficace quels difficultés majeures rencontrez-vous)*

.....  
 .....

Q15. To what extent has ICT tools been useful in the confection of scheme of work by teachers on campus? *(Selon vous quel est le degré d'efficacité des outils de TIC dans la conception des fiches de progressions des enseignants?)*

Propositions	1) To a greater Extent	2) To some Extent	3) Not at All	4) Don't Know
Tick your choice				
Total				

Q15.2 To what extent has ICT tools been used in the preparation of lessons by teachers on campus? (*Selon vous quel est le degré d'efficacité des outils de TIC dans la préparation des leçons des enseignants?*)

Propositions	1) To a greater Extent	2) To some Extent	3) Not at All	4) Don't Know
Tick your choice				
Total				

Q15.3 To what extent has ICT tools been used in the preparation of sequential examination by teachers on campus? (*Selon vous quel est le degré d'efficacité des outils de TIC dans la préparation des examens séquentiels* )

Propositions	1) To a greater Extent	2) To some Extent	3) Not at All	4) Don't Know
Tick your choice				
Total				

Q15.4 To what extent has ICT tools been used in the writing of pedagogic reports by the various Head of Departments on campus? (*Selon vous quel est le degré d'efficacité des outils de TIC dans la conception des rapports pédagogiques par les chefs de départements ?*)

Propositions	1) To a greater Extent	2) To some Extent	3) Not at All	4) Don't Know
Tick your choice				
Total				

Q16. Which are the major challenges facing teachers in ICT Application in school administration in your school? Please propose some solutions. (*quels sont les défis majeurs que font face les enseignants dans l'application des TIC dans votre administration. Proposer quelques solutions*)

.....  
 .....  
 .....

Q17. How effective is the application of ICT tools in the management of discipline on campus? (*Selon vous quel est le degré d'efficacité des outils de TIC pour assurer les disciplines dans l'établissement ?*)

Propositions	1) Very Effective	2) Effective	3) Not Effective
Tick your choice			
Total			

**DIFFERENTES GRILLES D’EVALUATION SUR L’EFFICACITE DES TIC  
DANS LA GESTION ADMINISTRATIVE EN MILIEU SCOLAIRE**

❖ **Obsevation Evaluation Grid**

Respondent’s Quality	Possession of a computer	
	YES	NO
Principal		
Vice Principals		
Discipline Masters		
Secretaries		
Total		

❖ **Interview Evaluation Grid**

Respondent’s Quality	Usage rating of ICT					
Principal						
Vice Principals						
Discipline Masters						
Animateur Pédagogique						
Total						

❖ **Establishment of the time Tables**

Respondent’s Quality	Establishment of the time Tables		
	Very effective	Effective	Not effective

❖ **Use of ICTs to build staff and student database**

Respondent’s Quality	Establishment of the time Tables			
	Always	At times	Never	No idea
<b>Principal</b>				
<b>Vice Principals</b>				
<b>Discipline Masters</b>				
Total				

## KARL PEARSON'S FORMULA TABLE

### Table de la loi de $\chi^2$ ou de Karl Pearson

Valeur de  $\chi^2$  pour laquelle la probabilité d'une valeur inférieure à  $\chi^2$  suivant le nombre  $n$  de degrés de liberté est  $\alpha = P(\chi^2 < \chi^2)$ .  
( $n$  : [1](#), [11](#), [21](#), [40](#)).

$n \backslash \alpha$	0,005	0,010	0,025	0,050	0,100	0,250	0,500	0,750	0,900	0,950	0,975	0,990	0,995
1	0,0000	0,0002	0,0010	0,0039	0,0158	0,102	0,455	1,32	2,71	3,84	5,02	6,63	7,88
2	0,0100	0,0201	0,0506	0,103	0,211	0,575	1,39	2,77	4,61	5,99	7,38	9,21	10,6
3	0,0717	0,115	0,216	0,352	0,584	1,21	2,37	4,11	6,25	7,81	9,35	11,3	12,8
4	0,207	0,297	0,484	0,711	1,06	1,92	3,36	5,39	7,78	9,49	11,1	13,3	14,9
5	0,412	0,554	0,831	1,15	1,61	2,67	4,35	6,63	9,24	11,1	12,8	15,1	16,7
6	0,676	0,872	1,24	1,64	2,20	3,45	5,35	7,84	10,6	12,6	14,4	16,8	18,5
7	0,989	1,24	1,69	2,17	2,83	4,25	6,35	9,04	12,0	14,1	16,0	18,5	20,3
8	1,34	1,65	2,18	2,73	3,49	5,07	7,34	10,2	13,4	15,5	17,5	20,1	22,0
9	1,73	2,09	2,70	3,33	4,17	5,90	8,34	11,4	14,7	16,9	19,0	21,7	23,6
10	2,16	2,56	3,25	3,94	4,87	6,74	9,34	12,5	16,0	18,3	20,5	23,2	25,2
11	2,60	3,05	3,82	4,57	5,58	7,58	10,3	13,7	17,3	19,7	21,9	24,7	26,8
12	3,07	3,57	4,40	5,23	6,30	8,44	11,3	14,8	18,5	21,0	23,3	26,2	28,3
13	3,57	4,11	5,01	5,89	7,04	9,30	12,3	16,0	19,8	22,4	24,7	27,7	29,8
14	4,07	4,66	5,63	6,57	7,79	10,2	13,3	17,1	21,1	23,7	26,1	29,1	31,3
15	4,60	5,23	6,26	7,26	8,55	11,0	14,3	18,2	22,3	25,0	27,5	30,6	32,8
16	5,14	5,81	6,91	7,96	9,31	11,9	15,3	19,4	23,5	26,3	28,8	32,0	34,3
17	5,70	6,41	7,56	8,67	10,1	12,8	16,3	20,5	24,8	27,6	32,0	33,4	35,7
18	6,26	7,01	8,23	9,39	10,9	13,7	17,3	21,6	26,0	28,9	31,5	34,8	37,2
19	6,84	7,63	8,91	10,1	11,7	14,6	18,3	22,7	27,2	30,1	32,9	36,2	38,6
20	7,43	8,26	9,56	10,9	12,4	15,5	19,3	23,8	28,4	31,4	34,2	37,6	40,0
21	8,03	8,90	10,3	11,6	13,2	16,3	20,3	24,9	29,6	32,7	35,5	38,9	41,4
22	8,64	9,54	11,0	12,3	14,0	17,2	21,3	26,0	30,8	33,9	36,8	40,3	42,8
23	9,26	10,2	11,7	13,1	14,8	18,1	22,3	27,1	32,0	35,2	38,1	41,6	44,2
24	9,89	10,9	12,4	13,8	15,7	19,0	23,3	28,2	33,2	36,4	39,4	43,0	45,6
25	10,5	11,5	13,1	14,6	16,5	19,9	24,3	29,3	34,4	37,7	40,6	44,3	46,9
26	11,2	12,2	13,8	15,4	17,3	20,8	25,3	30,1	35,6	38,9	41,9	45,6	48,3
27	11,8	12,9	14,6	16,2	18,1	21,7	26,3	31,5	36,7	40,1	43,2	47,0	49,6
28	12,5	13,6	15,3	16,9	18,9	22,7	27,3	32,6	37,9	41,3	44,5	48,3	51,0
29	13,1	14,3	16,0	17,7	19,8	23,6	28,3	33,7	39,1	42,6	45,7	49,6	52,3
30	13,8	15,0	16,8	18,5	20,6	24,5	29,3	34,8	40,3	43,8	47,0	50,9	53,7
40	20,7	22,2	24,4	26,5	29,1	33,7	39,3	45,6	51,8	55,8	59,3	63,7	66,8
50	28,0	29,7	32,4	34,8	37,7	42,9	49,3	56,3	63,2	67,5	71,4	76,2	79,5
60	35,5	37,5	40,5	43,2	46,5	52,3	59,3	67,0	74,4	79,1	83,3	88,4	92,0
70	43,3	45,4	48,8	51,7	55,3	61,7	69,3	77,6	85,5	90,5	95,0	100,4	104,2
80	51,2	53,5	57,2	60,4	64,3	71,1	79,3	88,1	96,6	101,9	106,6	112,4	116,3
90	59,2	61,8	65,6	69,1	73,3	80,6	89,3	98,6	107,6	113,1	118,1	124,1	128,3
100	67,3	70,1	74,2	77,9	82,4	90,1	99,3	109,1	118,5	124,3	129,6	135,8	140,2

## **AUTORISATION LETTER FOR THE COLLECT OF DATA ON THE FIELD**



