Benchmarking of Education Leaders' Technology Utilization

A study of the attitudes of education leaders in using technology

مؤشرات توظيف إدارات التعليم للتكنولوجيا

دراسة حول سلوك إدارات التعليم نحو استخدام التكنولوجيا

By

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Abstract

The purpose of this research is to study the attitudes of education leaders in using technology in 13 technology-enriched private schools in the United Arab Emirates. Three research questions were formulated to achieve the purpose of the research. Five hypotheses were proposed in support of those questions. Quantitative methodology was used. Both descriptive and inferential statistical data analyses led to answer the research questions.

A survey constructed by the researcher was used as an instrument to identify the technology tools that are being used for presentation, communication, file management, class observation, and feedback collection. The significant effect of gender, age, and years of experience with relative to the six NETS-A categories; Leadership and vision, Learning and Teaching, Professional Practices, Management and Operation, Assessment of Technology Use in Schools and Social and Legal Issues were also explored.

The theoretical findings of the research revealed that education leaders need to share the vision of technology use and develop an understanding of the 21st century skills required for a competent digital citizen. Moreover, education leaders need to be prepared for the role in their higher education and the professional development they receive.

The empirical findings showed a strong tendency to use technology tools as a substitution of the conventional ones with null, or minimal functional improvement according to SAMR model. Furthermore, no significant effect of gender was noticed on the education leaders' attitudes in terms of using technology in schools. However, age ranges and years of experience affected particular categories. The three research questions were answered and further research is recommended.

ملخص

يهدف هذا البحث إلى دراسة سلوك إدارات التعليم في المدارس نحو استخدام التكنولوجيا، أجريت الدراسة في 13 مدرسة تزخر بتكنولوجيا التعليم في دولة الامارات العربية المتحدة. هناك ثلاثة اسئلة للبحث تمت صياغتها لتحقيق الهدف من الدراسة. كما أن هناك خمس فرضيات تم طرحها للمساعدة في الإجابة على تلك الأسئلة.

لقد أجريت تحاليل وصفية و إحصائية للنتائج التي تم جمعها من خلال دراسة كمية للبيانات. استخدمت الباحثة استبيان كأداة لجمع المعلومات حول كيفية استخدام الهيئات الإدارية في المدارس للتكنولوجيا لأهداف متعددة منها: عرض المعلومات و التواصل و مراقبة الحصص الصفية و جمع التغذية الراجعة. و بناءً على ذلك تم التوصل لعدة نتائج تتعلق بتأثير جنس المدير و عدد سنوات الخبرة و الفئة العمرية على استخدامه للتكنولوجيا حسب النموذج المقترح من ISTE و هو NETS-A و يتضمن : القيادة و الرؤية، التعلم و التعليم ، الممارسات المهنية ،إدارة العمليات ، التقييم ، و أخيراً النواحي الاجتماعية والقانونية.

أما النتائج النظرية للبحث فكشفت عن الحاجة لوجود رؤية مشتركة لكيفية استخدام التنولوجيا في المدارس. و كذلك أهمية تطوير فهم هؤلاء المدراء للمهارات المطلوبة للقرن الواحد و العشرين . كما أن هناك حاجة ملحة لتهيئة القيادات الإدارية في المدارس أثناء مراحل الدراسة العليا و التطوير المهني أثناء العمل.

أما بالنسبة للنتائج التجريبية، فقد تم التوصل إلى ميل المدراء لاستخدام التكنولوجيا كبديل للوسائل التقليدية مع القليل من التحسين الوظيفي لها كما ورد في نموذج SAMR. و من النتائج أيضاً عدم وجود تأثير واضح لجنس المدير سواءً كان ذكر أم أنثى. إلا أن هناك تأثير لعدد سنوات الخبرة و الفئة العمرية على مجالات محدودة حسب نموذج NETS-A . و بذلك تمت الإجابة على أسئلة البحث ووضعت التوصيات لإجراء المزيد من الدراسة في ذات الموضوع.

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Besides, I would like to deeply thank my dear husband for his great support during my studies. He stood by me the whole journey, advised me, and supported me limitlessly.

Last but not least, my great beloved parents, my brothers and sisters. The least I can say is thank you. Thank you so much for your endless help and prayers and the esteem you provided. Words would never express my gratitude.

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List of Acronyms

ANOVA	Analysis of Variance
df	degree of freedome
ISTE	International Society for Technology in Education
MS	Mean Square
NETS-A	National Educational Technology Standards for Administrators
NETS-S	National Educational Technology Standards for Students
NETS-T	National Educational Technology Standards for Teachers
SAMR	Substitution, Augmentation, Modification, and Redefinition
SPSS	Statistical Package for the Social Science
SS	Sum of Squares

Chapter 1: Introduction

1.1 Background

This research is being narrated to identify educational leadership attitudes in using technologies and its relationship with the benchmarked knowledge and skills. Higher education institution as an organization producing special goods - educational services, there are number of features, at the present stage of development of the market that should be particularly careful approach to the process of developing a strategy of competitiveness. For universities, it is advisable to focus on the application of innovative methods, forms and tools for the management of all types of its own activities, including the educational process (Chang, 2012).

Only under conditions of higher education will be able to meet the current requirements and trends of the global education market, providing an achievement given the level of competitiveness in the short and long term. The concept of "quality of education" has received international citizenship held in Paris in 1998 by the World Conference on Higher Education, which stated that improving the quality of education is one of the main objectives of education in the long term (Buabeng-Andoh, 2012). Despite the widespread use of the term, enter an unambiguous definition of the category of quality of education is difficult.

1.1.1 Educational technology and quality of education

The argument about educational quality management is endless. It is directly linked with the rapid changes taking place both in all areas of modern life as well as in the field of education itself. Improving quality has become a key idea of the new philosophy of education (Chang, 2012). Charles Darwin believed that survives is not the strongest nor the most intelligent, but the one who best responds to changes (Buabeng-Andoh, 2012). The key for better adaptation.

In general, education is changing priorities and demands of the society, a paradigm shift prepares students and professionals, which reflects the different content, different approaches to training, another right, other relations, different behavior, a different mentality of teaching. In the current circumstances, the school teachers and university teachers are the

task of training the person, who knows how to navigate the environment (Buabeng-Andoh, 2012).

Culture and education must meet the conditions of modern life and the needs of formation of a new, humanistic, open and the Information Society, which requires a new type of education: personality-oriented, humanistic and information. There are different conditions required for special attention, as the quality of education every year increasingly acts as the major backbone and driving force in social development and formation of the person. United Kingdom has long been educated in the proper sense a priori considered as not subject to measurement and evaluation (Cheung, 2013). Society, the state and the person did not have criteria that provide objective assessment of the level of education of the individual and the quality of educational establishments (Chang, 2012). The subject of discussion and action among the leaders of the UK Technical Society of the late 20th century and especially the end of 1920-1930 during the industrialization of the country becomes a topic of quality of education.

In 1960-1980-ies, every four or five years of higher authorities issued decisions on matters of education, where the quality of education, especially higher education, and the quality of training have become key terms - the categories of state educational policy in connection with the socio-economic transformation in the country. With 90 years of 20th century (Cheung, 2013). The education system is developing actively. Hence the need for reliable scientific methods for assessing the achievement (Chang, 2012). Today, the man himself became the main resources of development. Human activities included high-tech components that required complex knowledge.

However, the most difficult of all the object is a person and the preparation of educated and moral rights - the most science-intensive of all processes (Buabeng-Andoh, 2012). Practical approached to evaluate the quality of education became necessary. Quality education is considered from the standpoint of the integrity of the content, teaching technologies, methods of monitoring and evaluation for compliance with the personal development of vital self-determination of the subject and the demands of society in the new socio-economic conditions (Chang, 2012). It acts as one of the most important characteristics that determine the competitiveness of individual schools and national education systems as a whole. Form new ideas about the quality of education received that a person is able to work independently, to learn and relearn (Cheung, 2013).

In this regard, the quality of education is seen as a concept that reflects the ability of the educational system to ensure the achievement of educational goals and objectives, meet

the needs of a particular individual in education, to ensure its conformity with the needs of society and the economy, i.e., determined by its socio-economic adequacy (Cheung, 2013). It is becoming increasingly common approach in which the main task of the learning process becomes the formation of creativity, teamwork, project thinking and analytical skills, communicative skills, tolerance and the ability to self-training that provides successful personal, professional and career development of young people (Buabeng-Andoh, 2012).

1.1.2 Educational technology for the modernization of education

This is an objective process that causes its reform and progress towards the formation of new meanings and values, education content and approaches to teaching methods, monitoring and evaluation of educational activities. The education system in a country guides the modernization of all other contexts. Therefore, the education system should be aligned with strategic plans of the country and supports the objective tendencies to everything new (Cheung, 2013). In this case, based on the motto of "Accessibility - Quality - Efficiency" (Chang, 2012).

Promising system of education must take into account the main challenges of the 21st century and the associated major problems of man in the modern and upcoming information society. The most important directions of the transition to a new educational concept, which will be the basis for the necessary conditions for the 21st century perspective of the education system are, in particular, fundamental of education at all levels; implementation of the concept of advanced education; the widespread use of innovative techniques and developing education through the use of advanced information technologies; improving access to quality education through the development of distance learning and information resources to support the learning process of modern information and communication technologies (Chang, 2012). However, new information technologies in education have in a number of aspects of the obvious negative impact of:

i. a different but unequal access;
ii. is unreasonably high expectations;
iii. the loss of personal contact;
iv. the equivalence of the diploma work;
v. Towards international standardization.

The debate about the international standardization is endless. Various models were developed to redefine the use of technology and to ensure proper implementation leads to desirable results.

Substitution, Augmentation, Modification, and Redefinition (SAMR) model was developed by Ruben R. Puentedura in 2009 to describe learning activities in schools (Puentedura, 2009). SAMR model can be be reflected on all technology use activities including those for teachers and administrators in schools to indicate the level at which those technologies are used. SAMR model can be an index of the transformation level (Jacobs-Israel and Moorefield-Lang, 2013).

Another example of the standardized models is the National Educational Technology Standards (NETS). The International Society for Technology in Education (ISTE) has developed a framework for students, teachers, and administrators' technology use; NETS-S, NETS-T, and NETS-A. NETS-A were designed to help administrators create a technology enriched environment and can be used to diagnose its effectiveness.

1.2 Problem Statement

An important and effective condition for progress in any society was and is the creation and expansion of a single interactive information space (Cheung, 2013). It is a common information space that has historically contributed significantly to accelerating the development of humanity as a whole, it is a decisive factor in improving the civilization in all spheres (spiritual, occupational, physical, cultural, and others). Sharing knowledge, joint efforts to further the knowledge of nature, the development of science, technology, culture - all this contributes to the effective increase in the material level (Chang, 2012). Therefore, creation of a single interactive information space can be considered a strategic objective of the introduction of modern and advanced information technologies in all spheres of human activity (Cheung, 2013). Schools' technology leadership undertakes the responsibility of the interactive information space in the education sector. Hence, the commencement of proper action plans would predict better contextual teaching and learning.

1.3 Purpose of the Study

Studies stated that school leaders should contrive a positive environment by being role models for their staff and students. Though, in this paper, the researcher was keen to

explore the practices of education leaders in using technology and relate it to benchmarked criteria.

1.4 Research Questions

Three main Research Questions were the focus of this study:

Research Question 1: What are the technologies possessed by education leaders with reference to SAMR model?

Research Question 2: What are education leaders' attitudes in using technology compared to the National Educational Technology Standards for Administrators (NETS-A)?

Research Question 3: Is there any significant relationship between education leaders attitudes in using technology and their demographics namely gender, age, and years of experience?

1.5 Hypotheses

Five hypotheses were proposed in support of the three research questions. Hypotheses 1 and 2 support research question 1, hypothesis 2 supports research question 2, and hypotheses 3 and 4 support research question 3.

Hypothesis 1: Education leaders tend to use various technology tools. However, these tools reflect a minimum level of interaction with staff and community.

Hypothesis 2: Education leaders use technology tools to substitute the classical model with minimum functional improvement.

Hypothesis 3: NETS-A can be used to generate forms to evaluate education leaders in terms of effective technology use.

Hypothesis 4: There is no significant effect of gender on the education leaders' attitudes in using technology.

Hypothesis 5: There exists a significant relationship between age and years of experience and the education leaders' attitudes in using technology.

1.5 Significance of the Study

Technology is becoming an important component of teaching and learning in schools and higher education due to many reasons; some of them are: the accelerated rate of social media spread, the considerable power of web 2.0 tools, and the instant unlimited access to all the different digital resources of information via Internet. Technology became a necessary for the change needed for the paradigm shift. However, talking about the change is much easier than doing it (Duncan 2011). On the hand, Cuba (2001) believed that stressing the importance of technology in education would bias the whole process from its purpose. Therefore, the dilemma is remaining.

Education leaders in schools play a significant role in standardizing practices related to technology use (DuFour and Eaker, 1992). Administrator, teachers, and students need to possess a set of skills and competencies that are important for effective educational technology (McLeod & Richardson 2011). Creating this list of standards is becoming a point of debate in the current research.

Research about school leaders' technology skills is viable (Gray & Lewis, 2009). Several studies proved that educational technology has a positive impact on teaching and learning (Ross, Morrison & Lowther 2010). Nevertheless, effective use of school technology requires preparation plans and professional development programs for all stakeholders in schools and higher education institutes, which is crucial to ensure effective performance for administrators, teachers, and students (Byrom & Bingham, 2001).

Studying the relationship between education leaders' attitudes in using technology and the international benchmarks would predict its efficacy and would help in generating validated evaluation forms.

1.6 Research Structure

This paper introduces the study of education leaders' technology utilization in five chapters:

- Chapter One provides a profound introduction of the research area, the rationale for the study, the research questions, hypotheses, and the significance of such studies to the educational field.

- Chapter Two reviews the related literature, conceptual mapping of the core concepts and theoretical framework for the study, further elaboration and theoretical consolidation.
- Chapter Three presents the methodology used in conducting this research, the sampling method, limitations and delimitations, and other aspects related to validity, reliability, and ethical considerations of the study. Moreover, the role of the researcher is elaborated.
- Chapter Four introduces the discussion and results of data analysis. Thus, descriptive and inferential statistical analyses are discussed in details.
- Chapter Five concludes both theoretical and empirical findings, the implications of the study, recommendation for further exploration. The scope of the study and a concluding note are introduced.

Chapter 2: Literature Review

In modern conditions, management of teaching staff to the director of the school puts more and more tasks. This is due primarily to the widespread introduction in the educational process of innovation, with the increasing flow of information, constantly rising level of training of professional teaching staff and others. In this regard, the most urgent is the question of the capacity of leaders of the school to use certain kinds of activities in the manual. Consider the concept of individual style of activity. Buabeng-Andoh, (2012) determines the individual style of activity as follows that the conditioned by typological features of a stable system of ways of life which develops in humans, striving for the best implementation of this activity, in the broadest sense - individually unique system of psychological tools, which consciously or spontaneously resort a person with a view to balancing the best typology due to its identity with subject, the external conditions of activity.

2.1 Conceptual Analysis

Chang (2012) claims that the special place is occupied by the study of leadership styles. Cheung (2013) distinguished between different approaches to the problem, the number of styles, selecting them for various reasons. One of the most popular in psychological science description of the styles of leadership belongs to Kurt Lewin. He identifies two aspects of leadership styles - the content of the solutions proposed by the head of the (formal aspect), and technology (methods) the implementation of these decisions (the substantive aspect). Consider these positions with basic leadership styles - authoritarian, democratic, liberal. Also, we determine how these styles will be shown in the manual teaching staff. The formal aspect of an authoritarian style - instructions given by the head of the business-like, briefly, frankly and openly, typical laconic command language, often surly tone, praise and blame are subjective. Head is "over the group." Informally - an event planned in advance, usually indicate only the next action, the prospect of teachers is not known, an opinion leader - decisive.

Teaching staff is afraid to take the initiative, because it can be punishable. In these circumstances, teachers have no opportunity to reveal his organizational and leadership skills. Outwardly, it appears in a collective order, but teaching staff is in emotional stress (Chang, 2012).

Democratic style - all activities took the form of suggestions made friendly tone, praise and blame, taking into account the views expressed subordinates' bans made in the form of proposals and discussions. There is a joint activity, the position of the head - "group." In content, most of the activities planned and discussed by the group, for their implementation meet all the participants, the head is not trying to use the decisive influence of his voice. Teaching staff is interested in the result of a joint activity, the team dominated the initiative, formed a conscious attitude to work. This teaching staff turnover is low, the teachers have the opportunity to realize their potential (Chang, 2012).

Liberal style - Conventional tone, lack of praise, censure proposals bans or orders not to speak out, and replaced by the presence of cooperation is missing, the position of the head - outside the group. In content, the head does not give verbal instructions and proposals affect only their presence, the work consists of separate interests, if not the head - teachers tend to do their business and leave work, because not interested in the end result of joint activities. In such pedagogical collectives there are small groups that exist independently, on their own, which suffer from the interests of the case. Liberal style of activity is also called permissive (Cheung, 2013). Kurt Lewin and his school believed that the leadership styles depend solely on the individual characteristics of a leader (Chang, 2012).

Modern approach to the study of leadership styles is somewhat different. Intensity of leadership styles on the factor "authoritarianism - liberalism" may be different - to its extreme forms, but style cannot be described only in the framework of this factor. The classification can be based on several factors: "authoritarianism - liberalism", "public - egocentric orientation", "business activity - inertia," "Contact - remote," "dominion - subordination", "focus on work performance - human relations", "stress tolerance - intolerance" (Chang 2012, p. 328-340). The modern approach, according (Cheung, 2013) that management styles are an integral characteristic activity of the head, which reflects not only his personal qualities, but the leader also has to react to the situation and to build relationships with employees more flexibility with taking into account the external environment (Cheung, 2013).

Also, managers must take into account the specific task and the individual characteristics of the members of the teaching staff. If the modern school principals will work on themselves, constantly improve their skills, including in the field of psychology, they will be able to apply different management styles teaching staff, reasonably combining their individual characteristics to operational needs. This flexibility will allow management pedagogical staff to work productively, achieving good results, as well as to develop creative individuality of each teacher (Chang, 2012).

In Summary, the concept and basic leadership skills that styles of thinking in leadership and problem solving, motivational space and evaluation of motivation, management convictions and effective communication skills, and leadership styles and their impact have Potential limitations of the leader and the ways of their development (Chang, 2012). Technologies used by education leaders reflect a certain level of high order cognitive skills and their attitudes toward having a digital management experience. Such experience would transform the management model from classic authoritarian into a more flexible one. Hence, their attitudes can be easily identified if the used technology tools are identified. Therefore, Styles of thinking and leadership would be expected. Figure 1, demonstrates a conceptual mapping for the above analysis.

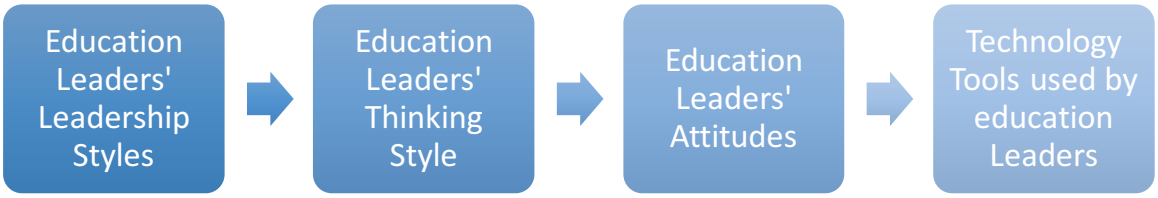

Figure 1 Conceptual Mapping

2.2 Theoretical Framework

Relating the technology skills of an education leader to the international benchmarks would predict the effectiveness of his/her management style and would demonstrate a good example of a competent 21st century citizen.

2.2.1 The Skills of an Effective Leader

According to Schuler (2015) that the discipline in the structure of the basic professional educational programs. The discipline "skills of an effective leader" is a series of professional Master's "Business processes in the service" as a discipline at the choice of its base portion (Cheung, 2013). Initial input requirements knowledge and skills students are formed on the basis of discipline "Psychology and psychological testing", "Service Operations", "Human Resource Management", "Time management", "management service" et al., Studied by students in previous semesters. The purpose of the discipline - the study of

the theory and practice of effective personnel management service company; preparation for management activities specialists able to carry out effective planning; operative, reasonable and balanced, with minimal risk to take decisions on the organization of business processes of enterprises in the service (Cheung, 2013).

2.2.2 Key technologies used in the education sector

In the process of studying the discipline used both traditional and active learning techniques: design, games, situational role, explanatory and illustrative, etc. Requirements for the results of the development of the discipline is studying the discipline that student must know the conceptual framework and basic skills of effective leadership; modern technologies of business process management; principles of time management in planning and organization of business processes; principles and techniques of effective communication; components of effective leadership; styles, techniques and limitations in the leadership; To be able to practice the methods of effective management of business processes in the field of service; plan and organize the activities of service companies on the basis of time management, setting goals and priorities, assessment of motivation; develop effective communication techniques; inspire and influence the staff, train and develop employees.

The process of studying the discipline aimed at forming students' basic professional competencies (Buabeng-Andoh, 2012). Currently, there is a growing role of information and social technologies in education, which provide a general computerization of students and teachers at that address at least three major challenges for providing access to the Internet for each student in the learning process, and preferably, at any time and from different places of residence (Cheung, 2013). The development of a common information space industries and educational presence in it at different times and independently of all participants in the educational and creative process (Chang, 2012). Based on the current pace of computerization of industry continuing education, as well as taking into account the non-uniformity of the process of computer-network providing the population at home, you can expect that as soon as these tasks fully and comprehensively addressed will not be.

At the same time, it increased awareness that the traditional scheme of education in the first half of life is obsolete and needs to be replaced with a continuous education and training throughout life. New forms of education are characterized by interactivity and collaboration in the learning process (Buabeng-Andoh, 2012). A new theory of learning, such

as constructivism focused on student learning without temporal and spatial boundaries. To improve the quality of education it is also expected to actively use the new educational technology. Different approaches to the definition of educational technology can be summarized as a set of ways of implementing curricula and training programs, which is a system of forms, methods and means of education, ensuring the achievement of educational goals (Cheung, 2013). The difference of educational technology specialists usually derived from the difference of the means of education. The use of information technology along with the computer technology determines the informational educational technologies used in schools.

Educational environment in which the educational technology, determined to work with the components, Technical (the kind used in computer technology and communications); Software-engineering (software support implemented technology training); Organizational and methodological (how students and teachers, organization of educational process) (Chang, 2012). Under the educational technologies in higher education is understood as a system of scientific and engineering knowledge, as well as methods and means that are used for creating, collecting, storing and processing information in the domain of higher education. Formed a direct correlation between the effectiveness of the implementation of training programs and the degree of integration into their respective information and communication technologies (Buabeng-Andoh, 2012). The most important task of understanding the problems of higher education lies in the fact that as a result to be achieved global rationalization of intellectual activity in the community through the use of new IT to improve the efficiency and quality of training to the level of information culture achieved in developed countries.

It shall be training with a new type of thinking, the relevant requirements of post-industrial society (Cheung, 2013). This aspect of education practice comment on the case. According to the Institute of Management assistant professor in the engineering industry of UK, the use of information systems in the learning process allows not only to give students information about the object of management, but also helps them to understand the diversity and complexity of relations characteristic of real companies, follow the dynamics of these relations in the changing external and internal factors, as well as destroy to form students' interdisciplinary barriers due to the time sequence of presentation subjects (Buabeng-Andoh, 2012). This tool makes it possible to build modern educational technology, which provide for the formation of the students' extraordinary thinking, creative approach to management.

Ultimately, their work becomes a set of standard procedures, and is based on an understanding of the causal relationships of phenomena and processes, which greatly increases its motivation and performance. But now, many managers and higher education theorists believe that the term "educational technology" is not entirely adequate (Chang, 2012). Most tend to say about information technology, about computer technologies, a little less - about communication technologies, and quite rare - it is already the subject of specific discussion - of audiovisual technologies (Buabeng-Andoh, 2012). We consider the information, communication and audiovisual technologies together as subordinates more important tasks - creating a new educational environment, where information, communication and audiovisual technology are organically included in the educational process to implement new educational models. One definition of the information educational environment formulates its understanding as an information system that integrates through network technology, software and hardware, organizational, methodological and software designed to improve the effectiveness and accessibility of educational training process.

UNESCO report on the main activities in the field of education and computer science after the First International Congress "Education and Informatics" indicated that is important, not the technology itself, and its interaction with education and its role in the context of the education system as a whole (Buabeng-Andoh, 2012). Today, one of the characteristics of the educational environment is the ability of students and teachers to access structured teaching materials, teaching multimedia complex whole university at any time and at any point in space. In addition to the availability of educational material, you must provide the student ability to communicate with the teacher to obtain advice on-line or off-line modes, as well as the possibility of individual "navigation" in the development of a subject (Cheung, 2013). Students will strive to flexible modes of learning, modular programs with multiple income and deductions that will earn credit units, freely transferable from one institution to another, taking into account previous experience, knowledge and skills (Chang, 2012).

It is still important for students will be the opportunity for personal development and professional growth; degree programs and short courses, perhaps, will enjoy the same demand; dramatically increase the need for programs of vocational training and post-graduate programs. The developers of distance education (DE) concretize the individualization of educational behavior as follows, for assuming that to the most pronounced features of student-centered teaching method that flexibility for the student is free to plan their own time, place and duration of employment and modularity materials for the study are available in the form of modules, which allows the student to generate the trajectory of his training in

accordance with their demands and potential (Cheung, 2013). Availability is the regardless of geographical and temporal situation of the student and the educational institution makes it possible not to limit the educational needs of the population (Chang, 2012).

Profitability economic efficiency is manifested by reducing the cost of maintaining the premises of educational institutions, resource saving time, material (printing, reproduction materials and so forth.) and the mobility of the effective implementation of feedback between teachers and students is one of the basic requirements and the reasons to the success of the process (Buabeng-Andoh, 2012). Coverage for the simultaneous appeal to many sources of educational information (digital libraries, data bases, knowledge bases, etc.). Workability for the use in the educational process of the latest advances in information and telecommunication technologies and social equality for equal access to education regardless of their place of residence, health status, elitism and material security trainee (Cheung, 2013). Internationalization is the exports and imports of world achievements in the educational market.

Information technology brings opportunities and the need to change the very model of the educational process: the transition from the reproductive study - "overflow" of knowledge from one head to another, from the teacher to the students - a creative model (as in the classroom with the help of new technological and technical support simulated life situations or process, students under the guidance of the teacher should apply their knowledge, to be creative for the analysis of simulated situations and come up with solutions to the tasks). Experts believe that the development of traditional and new technologies should follow the principle of subsidiarity that, it suggests a completely new dimension of the educational environment - global dimension that exists in real time, and is associated in itself the totality of educational technology (Buabeng-Andoh, 2012).

Internet which includes all the others, and its success is due to the fact that it can give everything to everyone nevertheless, there is always scope for the application of technology lower level, such as computer conferencing or e-mail. It was time to give up the distance learning courses that are global in nature, but do not use any computer or communication technology. According to Schuler, the most important feature of this new technology is that it allows you to create a network of the community (Chang, 2012). With this notion of community acquired global reach and some brand new features. According to the Schuler that one of the most important features of this space is its global nature that allows for virtually instant communication and dialogue. Already, this environment is indispensable for commercial and financial transactions, involving contacting a variety of societies and

cultures. Thus, the Internet is both a major cause of globalization and its most visible manifestation.

Moreover, it defines the nature of globalization and online communities. Internet have the various aspects of globalization (scientific, technological, economic, cultural and educational) had a very significant impact on the traditional full-time education, and the development of a variety of educational innovations, such as distance learning and virtual universities (Buabeng-Andoh, 2012). In all these organizations, globalization requires a deep and radical change of structure, methods of teaching and research, and training of administrative and teaching staff. The structure of the educational environment. Analysis of the strengths and weaknesses of existing information educational environment and the current state of information technology and telecommunications, allows us to formulate the following principles that should be built is currently projected educational environment (Cheung, 2013).

The multicomponent information of educational environment is a multi-medium, which includes training materials, high-tech software, training systems, the control of knowledge, hardware, databases and information and reference systems, the storage of information of any kind, including graphics, video, and so forth., interconnected. Integrality of the information component of the ITS should include all the necessary set of basic knowledge in the fields of science and technology with access to the resources of the world, defines the profile of training, take into account the inter-disciplinary communication, information-reference database of additional training materials, detailing and deepening knowledge (Buabeng-Andoh, 2012). Adaptability of the information-educational environment should not be rejected by the current education system does not violate its structure and principles of construction, should also allow the flexibility to modify the core of ITS information to adequately reflect the needs of society (Chang, 2012).

Formulated principles of ITS necessitates consideration of the educational environment, on the one hand, as part of the traditional education system, and, on the other hand, as an independent system, aimed at the development of creative activity of pupils with new information technology. According to Creswell (2005), today the problem of education in general - the problem is not technology, but human teacher who comes into the audience. That teacher is the weak link in terms of information technology. In addition, most of the professionals working in schools often have no teacher training. Therefore, the emphasis in education should be primarily directed to the pedagogical training of teachers of subject. By combining teacher training and education in the field of new information technologies, it will

be possible to ensure a breakthrough in creating a new learning environment. In the traditional academic environment teachers are carefully selected for very strict criteria, which are mainly academic in nature, taking into account confounding factors, the availability of research and publications, and so on.

However, performance benchmarking application depends on the right choice of the object of improving, the definition of company-standard and usefulness of its experience to the development of the system implementation and support of the activities of the educational experience in the organization in relation to its strategic management system (Buabeng-Andoh, 2012). This is a fairly resource-intensive process, so the use of the method of measuring the achievements of the university as a carrier and provider of intelligent systems in the implementation of benchmarking mechanism for ensuring competitiveness - a prerequisite for its effective implementation.

As a research as a tool for ensuring the competitiveness of the educational institution, benchmarking has been selected as the most universal means of comparison and evaluation of educational services, awareness of the needs of consumers, identify strengths and weaknesses of the university in relation to the position of other institutions of higher learning and the use of best practices of business (Cheung, 2013). The use of benchmarking in the planning system of the university's competitiveness strategy for continuously identify and those the quality of higher education institutions that are the source of the key benefits, and the qualities that are required to implement effective reforms. Thus, the tool shows the direction of ways of development, improvement and adjustment of the basic properties and principles of the functioning of the university in order to enhance its competitiveness (Chang, 2012).

That is the idea of continuous improvement, systematization of the learning process and the implementation of best business practices are at the heart of the concept of benchmarking. In Japan, the USA and other countries around the world since the end of the last century, developed a benchmarking program with government support. According to Creswell (2005) that a kind of "industrial dating agency" that are designed specifically to find benchmarking partners. It is believed that through this experience sharing and benefit individual organizations and the economy as a whole. The practice of benchmarking is not as common, despite the fact that it promotes openness of doing business, improve its efficiency allows to keep up with the times and take a worthy place in the global market which is very important for the economy to emerge from the global financial crisis and inter-ethnic integration in the community. Probably the fact that the use of benchmarking is associated with a number of serious problems.

One of the key problems is the reluctance of some leaders to recognize the weakness of the competitive position of the educational organization and the need to change their management systems or the whole educational process (Buabeng-Andoh, 2012). In addition, the introduction of benchmarking techniques must take into account a number of points that it is a resource-intensive process that requires a great deal of time, money, etc. Not every leader agrees to deferred investment results provided a certain amount of financial resources for research and innovation. In addition, limited resources leads to a rejection of outside expertise and using the services of consulting firms (Cheung, 2013). Most management decisions are taken only on the basis of popular business books that can entail the following problem.

The gap between theory and practice that knowledge of the nature of the instrument does not provide the ability to possession. That is why for the successful implementation of the adapted to apply the experience needed experts with experience in the application of modern management tools within the specifics of educational organizations (Chang, 2012). Lack of understanding of the project boundary of educational recipient organization wishes to improve once all areas of its activities, which, in principle, impossible. Or having a positive experience with benchmarking, for example, to improve one of the processes, the university brings its actions to improve the process of a different order. Problems can also arise when a fuzzy goal setting benchmarking. Furthermore, choice of benchmark of companies can also be a serious problem, because the risk of error is great. That is why the team for the implementation of benchmarking is desirable to include experts with experience with this technology.

The solution to this problem, in our opinion, might be in use pattern recognition techniques, as a major release as the problem of intangible indicators are generally used performance (financial indicators, the number of issued certificates, educational programs, etc.), correlated with the key factors for success in the competition. Due to the lack of educational institutions of balanced systems for the collection, evaluation, implementation and analysis of successful business decisions rarely measured and compared performance without rigorous methods for determining, for example, the team spirit, the level of stress (Chang, 2012). The employees of the educational institutes, the degree of attention to the consumers of educational services or the level of their physical and psychological comfort. It's an understanding of all employees need to implement benchmarking and the role of each in the implementation of improvements is an important condition for its successful use (Cheung, 2013).

The negative attitude of both managers and subordinates can become a big problem if you want effective use of benchmarking. Abuse of benchmarking involves the violation of the "Code of benchmarking". For example, often legality is used illegal ways to find or use of information and exchange is one of the educational institutions, having received the necessary information, refuses to provide similar information for benchmarking partner; Confidentiality and use of information are the information obtained is used or disclosed the purpose of benchmarking, etc. (Buabeng-Andoh, 2012). Complex "secrecy" of organizations, is a great obstacle to initiating benchmarking study. Moreover, the existing human resource policies and financial accounting of the company is not always possible to obtain real data on certain indicators. Until recently, the problem was so urgent on it for educational institutions, but in terms of acquisition of universities traits enterprise organizations can resound with new force.

The decision makes it possible to implement the identified problems and the potential to create an infrastructure for technology benchmarking contributes to broader and more effective use of the experience of others as a guide to improve the activities of educational institutions (Cheung, 2013). The advent of the Internet, as well as a variety of other electronic and digital resources, has set a number of new higher education issues. Some students use the Internet as the main alternative to the traditional literature. In this context, they are faced with problems of origin, accuracy and reliability of found material, most of which are superfluous within the usual forms of academic publishing (Chang, 2012). The quality of information contained in books, magazines and other types of printed materials, previously ensured due to various factors: respected publishers of recognized academic merit authors recommended tutors texts cost of the library, designed to provide access to all necessary materials. However, in respect of Internet resources such quality assurance mechanisms do not operate. User will have to critically evaluate them (Buabeng-Andoh, 2012). Information technology has made the preparation and use of information is artificial light. Bringing all the information in a standard format (in recent times - the format of web pages), they prevent us to recognize the existence of differences between the way in which information is produced, and that the type of information obtained as a result. The Internet also confronts us with new ethical issues, difficult issues of copyright ownership of information and plagiarism.

The study of settings students for electronic resources, conducted by Schuler (2015), found that a significant number of students is obvious leaves the university without having the skills in action based on the information society. In US, the American Library Association generated the prominent report about information literacy stating that people, not

only need to be digitally literate, but also can evaluate its accuracy and detect its errors. In the US, a National Forum on Information Literacy, which involves many educational institutions and organizations (Buabeng-Andoh, 2012).

Developing the idea, many analysts see something called information literacy, as it allows individuals to not only effectively use information and information technology and to adapt to their ever-changing environment, but also to critically comprehend the information industry and the information society as a whole. Creswell (2005) draw a parallel between the information literacy man and the old idea of educated person. According to, describing the information as goods necessary for survival said that they are going to teach their members to become independent and competent information consumers in the process of continuous learning throughout life (Cheung, 2013).

In higher education information skills has highlighted some issue in several lines that the line associated with the research skills, in which students have to feel the need for the implementation of research at the level of higher education, there is a line associated with the "work tools" of the student; line, indicating that the students must be fully prepared to fulfill their duties, whatever the sphere of professional activity, they have not chosen after graduation (Cheung, 2013). It requires skills such as the ability to use the library of the university and its resources to continue their research, the ability to exercise literature search any kind of depth and complexity, which is required under the specific educational / disciplinary area and the ability to satisfactorily demonstrate all tutors and experts in any desired form by quotations and references to the source and read the collected information.

This approach is built around the idea of competence of students that is the student who is communicate interactively and effectively in his scholarly community (Buabeng-Andoh, 2012). Inside the line indicated above, the "information skills" can be defined more broadly to include aspects of critical thinking toward the use of information and its relevant to the real world, in addition to the ability to validate this information and check for its accuracy through cross-referencing and other scientific means. There are different forms of information communication. It can be formal or informal, structured or random, as well as interpersonal or mediated. It is at this level of information skills appropriate to use the term "information literacy" (Cheung, 2013).

2.3 Similar Studies

Kythreotis & Pashiardis (2006) attempted to determine the relationship between school leadership and school effectiveness in Cyprus. Whereas AlAmmari (2012) stated that educational technology can improve education quality which can be demonstrated by improved students' achievement neglecting the role of the school director or technology leadership. An evaluation of the scientific researches conducted in the period of 2007-2012 about technology leadership in Turkey was handeled by Uysal and Madenoğlu (2015).

Fisher and Waller (2013) studied the technology leadership in Texas by examining the technology leaders' perspectives and their abilities to effectively manage technology integration in comparison to the teachers' perspective. The results of the study showed differences in the two perspectives and a positive correlation between teachers' effective technology integration and the professional development they receive about using technology in the classroom. Cakir (2012) conducted another similar study. Yet, a comparison between school administrators as technology leaders and computer teachers who were assumed to be responsible of technology integration.

2.4 Further Elaboration

Various studies were conducted in different parts of the world to explore leadership styles and its effects on teaching and learning or studied the educational technology itself and its impact on students' achievement. Less studies were found about benchmarking of educational technology leadership on the school environment and the necessary skills technology leaders must acquire. Likewise, the literature lacks a detailed study of the criteria which determine proper technology integration and the different performance indicators. The researcher of this study tried to fulfill this gap. Though, further studies are recommended.

2.5 Theoretical consolidation

The study of the education leaders' attitudes in using technology requires an understanding of the following perceptions:

1. Leadership Styles
2. Thinking Skills
3. Attitudes
4. The used technology tools

5. International benchmarking schemes

A blended form of the above perceptions would generate a standard framework for proper technology utilization in schools.

Chapter 3: Methodology

Quantitative method was used in this research. Pre-determined instrument based questions; attitude data, statistical analysis and interpretation are major features of a quantitative research (Cresswell, 2013). None experimental designed survey was developed to collect the quantitative data. Such design provides a numeric description of trends and attitudes of a population.

This research went into three phases; a thorough study of the related literature, running the research including analyses of the literature and the survey results, and then discussing its findings and recommendations. The researcher used 84 research papers to make sure proper data has been collected and reliable results have been achieved. The abstracts of many other research papers were screened to choose the most relevant content. Research about the evaluation of the education leaders' use of technology in a school context was the centre of attention of the completely screening process.

3.1 Data Collection Method

The most critical element of the data collection method is getting the right data from the right sources according to Creswell (2007).

The quantitative data was collected thoughtfully by the researcher via "Educational Technology Leadership Survey". A three dimensional survey was constructed by the researcher; Demographic data of the participants, technology tools that are being used for school daily activities, and their knowledge and skills that reflect their attitudes in using technology. Those dimensions were adapted from the reviewed literature and the International Standards of Technology in Education (ISTE). An internationally approved list of standards. The National Educational Technology Standards for Administrators (NETS-A) guided the researcher to construct six sub-categories for the third section of the survey.

Flower (2013) stated that surveys are used to produce statistical data and conclusions. Questions of the survey need to be deigned to study aspects of the study population. Answers of those questions can be analysed. Sampling methods, questions' design and the way of collecting data are major components of a survey.

3.2 Educational Technology Leadership Survey

The Educational Technology Leadership Survey includes three sections; Demographic Data, Technology Tools, and Knowledge and Practice. Demographic data of the participants were collected including gender, age range, and years of experience in the education sector. List of technology tools used frequently by school leaders were listed in the second section. In addition to thirty-one five-point traditional Likert scale items to comprise schools' leaders' performance in managing educational technology and technology school resources. Options ranging from "Always" to "Not at all" were offered. The survey questions were turned into a web-based form to save cost and time (Fleming & Bowden 2009). All survey elements were aligned with the research questions. Furthermore, they show how principals lead technology, how do they employ data retrieved from various technology sources, and to what extent their education technology leadership skills affect the instructional process inside the school. The Survey used in this research proposed a cross-sectional and longitudinal study of the population (Babbie, 1990, Flower 2013). Dependent and independent variables of the study were determined and analyzed.

3.3 Sampling Method

The literature stated two types of sampling methods; random sampling and purposive, which sometimes called, non-probability sampling method (Ghauri & Gronhaug, 2005). For random sampling, all elements of the population have equal probability to be selected to contribute in the study. However, for the non-probability sampling method, only certain elements of the population are selected according to the purpose of the study. Hence, for this particular study, purposive or non-probability sampling method was used.

The survey was distributed to 13 technology-enriched private schools in the United Arab Emirates (UAE), for which number of students is more than 800. The schools were located in Abu Dhabi, Dubai, Sharjah, and Ras Al Khaimah. The selection of these schools was based on observations related to the use of technology and reviews of various accreditation bodies. A population of principals, vice-principals, head of departments/head of subject, and technology/e-learning coordinators (n=97). Participants were informed of the voluntary and the anonymity nature of their contribution that would be maintained throughout the study. A stratified sample (n=69) were able to take the survey. The sample was made up of principals (n=10), vice-principals (n=12), head of departments/head of subject (n=33) and technology/e-learning coordinators (n=14).

A cover letter introducing the researcher, the purpose of the study and the expected time it might need were brought in. A Google form via www.drive.google.com was created, which enabled the researcher to follow up on the data collection progress. Timestamps and initial data analysis were also facilitated by the free online tool. The printed form is attached in Appendix A.

3.4 Limitations

The limitations of the study were identified. As in any other quantitative research, it was assumed that the collected data was accurate and valid to be processed for the analysis of results. However, this is not always the case. The accuracy and the validity of this data could not be assured absolutely. Lack of comprehensive information about the participants' education and background might be another limitation.

Time management is an important skill to be in possession. Due to the full time job of the researcher and other career commitments, it was important to understand the challenging tasks and the importance of proper planning for the different research phases. Especially that the researcher needed to travel between the emirates to introduce herself and the research purpose in order to collect more number of responses. After many attempts of contacting schools via email, yet, no or minimal responses was obtained during the first two weeks. Reminders for participants to complete the survey were sent. The researcher had to phone call or revisit sites a few times. That was another limitation of the study and it was pointed out by Julie and Cooper (1983) in their study of responses rates of questionnaires. The researcher tried to minimize the potential impact of those limitations and had recommended to connect them to further research

3.5 Delimitations

The first delimitation of the research was the choice of topic. The researcher chose to study the education leaders' attitudes in using technology using a survey as a tool to collect quantitative data. The three sections of the survey were also another delimitation. Variables of the study including Age range, gender, and years of experience were chosen to maintain a clear scope of the study and that would help the researcher get reliable and valid results (Simon, 2011).

In addition to the above delimitations, the contextual conditions are considered to delimit the study. All participants are education leaders in UAE private school. Hence, the study cannot be generalized for public schools or even private schools outside the UAE.

3.6 Validity

The concept of validity is changing over time to become broader yet, more complex as stated in the literature. Winter (2000) claimed that validity is associated with the methodology. It is concerning how truthful are the results. According to Wolming & Wikström (2010), there are three perspectives for validity; criterion-related validity, construct validity and content validity. Criterion-based validity is concerned with the comparison between the instrument, methodology and the results. Construct validity is concerned with the instrument and its construct. While content validity is the degree, to which the instrument and the sample could provide adequate details for the study. The gap between theoretical validity and the practical validity is increasing due to the newly broad definition and the three perspectives.

Neuman (2005), introduced two other perspectives for validity; internal and external. Onwuegbuzie (2000) stated that the study is claimed to be internally valid only if the established cause-effect relationship for the manipulated independent variables is valid. Unlike the external validity when the results could be generalized outside the study context with a comprehensive description of the field (Cresswell, 2005). Golafshani (2003) claimed that validity is common in quantitative studies and defined as the measure of the truthful nature of the results. Validity can also be established through different methods reflective journal, self-description, and peer-debriefing are some of them (Kumar, 2007).

Based on the above literature and the reflective journals used to review every questionnaire, this research is claimed to be valid, internal validity is proven.

3.7 Reliability

Jobb (2000) defined reliability as the consistency of results over time and the accuracy of the population presentation. Kirk and Miller (1986) elaborated the definition of reliability and suggested three types of it: similar results for repeated measurements, measurement satiability, and measurement similarity in a certain period of time. Higher stability indicates higher reliability. Charles (1995) suggested the test-retest method to check whether the instrument gives the same results each time or not. However, Jobbe (2000)

pointed out that the retest process may influence the respondents and yet change their answers (Crocker and Algina, 1986) confirmed that it is the researchers' responsibility to ensure high accuracy and consistent responses. Therefore, the consistent results that are obtained from respondents indicated high reliability of the instrument used i.e. the survey.

3.8 Ethical Considerations

Ethical considerations should be taken care throughout the whole process of conducting a research. Cresswell (2013) stated different aspects to foresee; research problem, research questions, data collection, data analysis, and writing. The researcher is fully aware of those aspects, the responsibility and the ethical issues associated with each phase of the research.

With regard to the research problem, the researcher was able to choose the topic of the study and was able to identify the problem statement, in addition to an explicit justification and rationale for the choice. Likewise, research questions were shared with the participants. It was declared that the research purpose is to answer this questions and nothing else.

Data collection is another aspect to consider. School leaders were invited to participate in the survey, and were given the choice to participate or not. The use of the survey as an instrument had maintained a low risk level for participant. They were directly informed that the survey responses are confidential and will not be used but for the purpose of the survey (Chang, 2012). It was also mentioned that all responses would be destroyed after a certain period from finishing the study. Consent letters were obtained from the schools' managements before any communication with their staff. Data collected for this research were objective and authentic (Buabeng-Andoh, 2012).

Furthermore, for data analysis, anonymity of the participants was protected and there was an account on the information for both analysis and interpretation.

3.9 Role of the Researcher

The researcher role is considered an important aspect to highlight when conducting a research. Kyvik (2013) stated that doing and managing the research is not the only role of the researcher. Communication, collaboration and evaluating the research are also required. The researcher of this paper attended those roles without being biased to any specific perception.

The researcher had also to keep a careful random selection of sample. A point where she had to stood at and monitor number of responses without affecting the participants. The researcher did not force or influence participants by any mean. All participants were able to do the survey on their own pace. The use of the well-known online tool Google Forms to collect the data, gave respondents a considerable level of autonomy to answer the survey freely.

Chapter 4: Discussion and Results

Technology is playing a vital role in the learning process in schools, specialists in the use of the media should work with teachers to help them develop instructional plans or designs for every day, for work units or classes for a full course (Hur, 2012, p.56). The success of these instructional designs requires careful planning and realistically face many problems to be solved. This is not achieved by chance and improvisation; but it involves a rigorous method that the school leader knows something about what to do, take the appropriate decisions and systematically carried out the action. The means to be used in "design" are required by the objectives, content and methods. The media are not supplementary teaching/managing, or its support: they are the stimulus itself. In light of this concept cannot be accepted outdated conception of the media as auxiliary aid (Wang, 2014, p.98).

4.1 Technology in Education

Different goals require different kinds of learning, so the resources to be suitable need to correspond to the required tasks. Certain tools may be better than others for certain purposes (Wang, 2014, p.99). In other cases, use of available equipment, suitability of costs and many other factors may be determinants of choice (Hur, 2012, p.58).

To define the effective technology tool to use is not easy but experts often use the term with different meanings. The two most commonly used definition are;

i. The use of technology (the means) in education and
ii. The application of behavioral sciences to teaching.

The first is the analysis and use of technological tools most appropriate to foster learning of learners. What we call technologies for teaching. The second concerns the design and assessment of systemic learning models using the knowledge derived from psychological theories, developmental and behavioral. What we call educational technology. Obviously, the two definitions are closely related: in the design and implementation of a learning model will use technologies for teaching (Hur, 2012, p.89). And then, the second definition is broader and more comprehensive. According to behaviorism, the knowledge and skills of an individual can be reduced to all the responses from that individual to the whole complex of the stimuli that his environment offers him. The human learning, therefore, you

can reduce the induction of desired behaviors through positive reinforcement. Most teachers do not understand or accept the educational value of audiovisual resources. Many believe that if they are not in front of the class, speaking, exhibiting or acting; learning is not performed (Wang, 2014, p.95). Others are refractory to the use of the image, because in one way or another it as a degradation of academic dignity, dignity in their view can only be maintained by oral communication and reading. This attitude is understandable as one teaches as taught and teachers, with few exceptions, have received an education based on the verbiage throughout his life and especially in professional or college preparation (Hur, 2012, p.123). Many other technologies can be used in the same context.

4.1.1 Technologies for Teaching

The set of technologies for teaching consists of all those hardware or software, by all technologies, which can be used to facilitate student learning and teaching by professors; although it may have been originally invented for other purposes (Hur, 2012, p.156). Any learning process whatever its strategy or psychological model uses some technology, some teaching tool. The simple pen, writing, book, printing, whiteboard, or even wax tablets, etc., When we speak of technologies for teaching, then, we should not only think, for example, VCR or computer. There are various ways to describe and classify the teaching tools. You could choose a chronological order and list them in order of invention and introduction in educational processes. You could then talk about traditional tools for teaching and in this group we could include exercise books, blackboard, books, maps, etc (Hur, 2012, p.563). They are still the means most used in everyday teaching in our schools, but were introduced in classrooms for decades, if not centuries.

The educational technology sector has grown steadily in recent years, patents have soared and the economic prospects are very promising, as evidenced by the fact that many investment funds are betting on startups in this sector. In fact, business figures do not cease to grow and even in places where they have cut public budgets in education, as in the US or UK government spending on educational technology has been growing. This could be taken as a clear indication of a progressive transformation of education through a combination of lower costs of equipment, the multiplicity of digital content and the incessant creation of applications, together with a skilled population and its use, they behave like the ingredients for a perfect storm.

However, the inevitable question of which countries school systems have managed to maximize the opportunities offered by technology, that is, where would you go to appreciate

in all its richness and complexity systemic educational innovation through technology, has an easy answer. A look at the results of the latest PISA survey shows that the top spots are occupied either by countries use comparatively low technology in school (Finland, South Korea and Japan) along with others where the figures credited use very high (Singapore, the Netherlands and Estonia). The conclusion to be drawn from this ambivalence is simply the quality of results in education has much to do with the presence or absence of technology as with the adopted pedagogy and the conditions under which it is applied in the classroom. In this sense, the professional skills of teachers and facilities and incentives for its continued development, are key. So when these skills are optimal, the use of technology to improve the quality of learning processes and at the same time, expand the horizon of what can be learned; very evident, for example, in the case of experimental and social sciences.

When these conditions are not met, the emergence of more technology in schools translates generally into new problems. The professional skills of teachers and administrators, facilities and incentives for continued development are the key when it descends to the level of the school or classroom chiaroscuro of the contribution of technology to the transformation of education are blurred. There is a real transformation of school, but is being given to begin backstage. It is quiet, almost imperceptible, but real. Indeed, the data accredited in European countries an overwhelming majority of teachers are regular users of the technology in their private lives, but more surprising is that most people are now also employ technological solutions for the preparation of their classes (Wang, 2014, p.325).

School administrative uses are equally lavish, including the growing use of platforms that facilitate communication with students and families outside school hours. Students, meanwhile, does not need anyone to explain to them how to leverage technology to output homework, but do not always do the lacking desirably at they tend to be, educational support in this area. In the educational work in the classroom technology it has made a fortune as a presentation tool, but still not for the personalization of learning and even less so desirable for process transformation. However, gradually narrowing the circle, slowly and quietly. We must seize this window of opportunity. Give a boost to this educational transformation means, once again, begin to get closer to the education professionals and discuss with them their needs and from teaching them to suggest solutions, often but not always, incorporate components technology. This explains why technological initiatives that succeed in education are mainly those that offer relevant and effective teachers or students solve their problems or real needs services. School leaders are responsible for the effectiveness of this process.

Ultimately, the goal is to have more technology but something much more important: that students learn more and better. The technology is present in everything around us, from our work, our community, our family, to our homes, in short everything related to daily life.

The space of the traditional communication between school administrations and community, therefore, narrows considerably and increases that of group work, individualized pathways of personal research and group. A model of collaborative work and constructive communication would be possible using conventional technology tools; but new technologies make it easier and more natural. With new technology it is quite easy to create virtual environments, simulations, which help schools' communities to develop interactivity; because it is put in a position to share ideas and concerns by acting in contexts 'concrete', to formulate hypotheses that can be immediately discussed. We should not, therefore, think of the new technologies as tools to "neutral", which can be linked to others to continue to pursue the same objectives with the same methods. We said that the various proposed solutions have advantages and disadvantages.

We believe that new technological strategies based much more on the approach constructivist; where collaborators are called to be equally contributors in making decisions.

4.2 Survey Discussion and Results

The survey comprised a comparative non-experimental study with inferential statistical analysis of frequencies and percentages (Duncan 2011). The survey design aimed to collect quantitative description of the sample demographics, background, and educational technology practices. Analyses of all responses frequencies and percentages are discussed below.

4.2.1 Descriptive Statistical Analysis

Descriptive data analysis shows responses of the different items of the survey. Frequencies and percentages were found to indicate those results. Tables and charts are used to summarize numerical details for the first two sections of the survey. Furthermore, mean values are used to show the central tendency of data for the third section.

4.2.2 Analysis of Demographic Data

Table 1 represents the demographic data collected from participants (n=69).

Table 1 Demographic Data

Survey Item	Interval	Frequency	Percentage
1. Age	20-29	5	7.25%
	30-39	19	27.54%
	40-49	31	44.93%
	50-59	14	20.29%
	60+	0	0.00%
2. Gender	Male	41	59.42%
	Female	28	40.58%
3. Years of experience in education	0-4	2	2.90%
	5-9	15	21.74%
	10-14	17	24.64%
	15-19	23	33.33%
	20-24	8	11.59%
	25+	4	5.80%

The largest group of participants (n=20, 47%) was of the age range of 40-49 years old, while only one participant (n=1, 4.35%) was of the age range 20-29 years old and none of them aged higher that 60. This matches the coherent relationship between age and years of experience where we can find that the largest number of participants were having 15-19 years of experience (n=23, 33.33%). May (2003) pointed out similar correlations in his research about technology management effectiveness. Such results would not be surprising for reasons related to the hiring requirements of school principals in the UAE, one of them is a minimum of five years of experience as vice-principal according to Abu Dhabi Educational Council (ADEC) (ADEC, 2015). Another possible reason was visa issuing restriction for expats

above 60 years old. On the other hand, Male participants (n=41, 59.42%) were participating compared to Female (n=28, 40.58%).

4.2.3 Analysis of Technology Tools

The second section of the survey included five questions to check for the technology tools school-leaders are using. Technology tools' list can be limitless. However, the most common ones were suggested to facilitate the analysis of results and to get participants having down-to-earth scenarios while thinking of the survey responses. Suggested tools reflect the level of technology utilization in SAMR model (Work, 2014). The questions of the second section are:

Question 1: Which of the following tools you use when you want to present something for staff/teachers?

Table 2 represents a summary of the results for question 1 in terms of frequency and percentage.

Table 2 Presentation Tools

	Presentation tool	Frequency	Percentage
1	PowerPoint	69	100.00 %
2	Google Slides	6	8.70 %
3	Keynote	21	33.30 %
4	Prezi	23	30.40 %
5	Explain Everything	2	2.90 %
6	Widgets	0	0.00 %
7	Nearpod	2	2.90 %
8	Google Hangout	6	8.70 %
9	Twitter Live Chat	12	17.40 %

Technology leaders used to use more PowerPoint, Keynote, and Prezi to present something for staff/teachers. Less usage of Twitter Live Chat and Nearpod, despite the fact that they are considered as interactive tools that could help audience interact effectively with the presenter. It was confirmed that pedagogical interactivity helps audience focus more on the objectives of the presentation (Kennewell et al., 2008).

Question 2: Which of the following tools you use when you communicate with parents and other community members?

Table 3 represents a summary of the results for question 2 in terms of frequency and percentage.

Table 3 Communication Tools

	Communication Tools	Frequency	Percentage
1	Email	69	100.00%
2	Website	63	91.30%
3	Google Drive	39	56.52%
4	School Wide Remind account	60	86.96%
5	Aurasma	2	2.90%
6	Twitter	12	17.39%
7	Symbaloo Page	0	00.00%
8	QR Codes	1	1.45%
9	Twitter Live Chat	11	15.94%

Communicating with parents was being done more via email, school website, and the school wide remind account. Reasons related to the culture of the country could be possible for not having an interactive communication channel between schools and parents.

Question 3: How do you manage your files?

Table 4 represents a summary of the results for question 3 in terms of frequency and percentage.

Table 4 File Management Tools

	File Management Tools	Frequency	Percentage
1	Attach a document to an email	69	100.00%
2	Save a document to flash drive	64	92.75%
3	Save a document to a school computer	69	100.00%
4	Upload to Dropbox	35	50.72%
5	Upload to Google Drive	42	60.87%
6	Share folders and files on Google Drive	38	55.07%

7	Share folders and files on Dropbox	25	36.23%
8	Upload data and use Google Analytics	12	17.39%
9	Use Google Drive, allow others to edit, comment, and share your documents	46	66.67%

For saving files, school leaders choose to use easier, yet a safer way to keep their documents on their computers, flash drives, or attach it to an email. Much less of them are using Google analytics (n=12, 17.39%) or Dropbox (n=25, 36.23%) to save files.

Question 4: Which of the following tools you use for classroom evaluation?

Table 5 represents a summary of the results for question 4 in terms of frequency and percentage.

Table 5 Classroom Evaluation Tools

	Classroom Evaluation Tools	Frequency	Percentage
1	Take notes using MS Word on a laptop.	67	97.10%
2	Take notes using a mobile device or tablet.	57	82.61%
3	View the lesson plan as an email attachment.	68	98.55%
4	Review the lesson plan on a mobile device during an observation.	49	71.01%
5	Record the lesson plan using a mobile device.	28	40.58%
6	Share the lesson plan and evaluation on Google Drive.	35	50.72%
7	Embed a recorded lesson plan within your evaluation.	27	39.13%

8	Meet with the teacher in a Google Hangout for the post-observation.	17	24.64%
9	Collaborate on the lesson plan and evaluation using Google Drive.	26	37.68%

Various tools were suggested for class observations/evaluations. Promising results showed different tools are being used. Having it as an email attachment is the most popular option for participants (n=67, 97.10%). Nonetheless, only participants (n=17, 24.64%) were using Google Hangout for post observation.

Question 5: Which of the following tools you use collect input or feedback from staff?

Table 6 represents a summary of the results for question 5 in terms of frequency and percentage.

Table 6 Feedback Collection Tools

	Feedback Collection Tools	Frequency	Percentage
1	Email ideas.	61	88.41%
2	Submit feedback and ideas using Google Forms.	49	71.01%
3	Use Poll Anywhere to receive input from staff.	12	17.39%
4	Share a Google Form spreadsheet and use comments to generate discussion.	11	15.94%
5	Use Google Chat for digital communication.	9	13.04%
6	Use collaborative mind maps to drive discussion.	8	11.59%
7	Collaborate on Google Docs.	28	40.58%
8	Share information with other administrators using Google	49	71.01%

Drive.		

Collecting feedback from staff was more of an interactive correspondent nature by using Google Drive and Google Forms. Yet, Email was the most common tool which substitutes a traditional approach with a basic type of interactivity.

The results of the second section of the survey showed an obvious tendency to use technology tools as substitution of the traditional ones.

4.2.4 Analysis of Education Leaders' Practices

Technology use and its effect on students' performance is strongly detected by the school leadership style (Law et al, 2003). That will specify the crucial standards for assessing the level of the principals' skills and knowledge in using technology.

The third section of the survey consisted of six categories; Leadership and Vision, Learning and Teaching, Productivity and Professional Practice, Support Management and Operations, Assessment and Evaluation, and last but not least, Social, Legal and Ethical Issues.

Thirty-one elements were included using a five-point Likert scale ranging from Always to Not at all. For the purpose of analyzing these results, values 1 to 5 were given, where 5 indicates Always, 4 for Most of the Times, 3 for Sometimes, 2 for Rarely, and 1 indicates Not at all. Table 2 shows the percentages of responses for each element. The elements of the survey were structured in a way to focus on how principals use technology, how do they employ data retrieved from various technology sources, and to what extent their education technology leadership skills affect the instructional and operational processes inside their schools. Table 7 represents a summary of the results for section 3.

Table 7 Education Leaders' Attitudes in Using Technology

	Answers	5		4		3		2		1	
Category	**Element**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
1.0 Leadership and Vision	1.1	26	37.68%	24	34.78%	17	24.64%	2	2.90%	0	0.00%
	1.2	14	20.29%	37	53.62%	16	23.19%	1	1.45%	1	1.45%
	1.3	4	5.80%	14	20.29%	27	39.13%	17	24.64%	7	10.14%
	1.4	12	17.39%	40	57.97%	13	18.84%	4	5.80%	0	0.00%
	1.5	21	30.43%	38	55.07%	8	11.59%	2	2.90%	0	0.00%
	1.6	5	7.25%	10	14.49%	9	13.04%	32	46.38%	13	18.84%
2.0 Learning and	2.1	19	27.54%	30	43.48%	18	26.09%	2	2.90%	0	0.00%
	2.2	16	23.19%	31	44.93%	20	28.99%	1	1.45%	1	1.45%
	2.3	14	20.29%	29	42.03%	17	24.64%	8	11.59%	1	1.45%

	2.4	9	13.04%	26	37.68%	26	37.68%	6	8.70%	2	2.90%
	2.5	13	18.84%	27	39.13%	18	26.09%	9	13.04%	2	2.90%
3.0 Productivity And Professional Practice	3.1	8	11.59%	24	34.78%	23	33.33%	9	13.04%	5	7.25%
	3.2	43	62.32%	22	31.88%	3	4.35%	1	1.45%	0	0.00%
	3.3	4	5.80%	9	13.04%	23	33.33%	26	37.68%	7	10.14%
	3.4	11	15.94%	23	33.33%	20	28.99%	14	20.29%	1	1.45%
	3.5	15	21.74%	30	43.48%	21	30.43%	3	4.35%	0	0.00%
	3.6	12	17.39%	22	31.88%	31	44.93%	3	4.35%	1	1.45%
4.0 Support, Management, And Operations	4.1	8	11.59%	18	26.09%	20	28.99%	18	26.09%	5	7.25%
	4.2	18	26.09%	29	42.03%	20	28.99%	2	2.90%	0	0.00%
	4.3	2	2.90%	11	15.94%	19	27.54%	27	39.13%	10	14.49%
	4.4	19	27.54%	24	34.78%	19	27.54%	6	8.70%	1	1.45%
	4.5	10	14.49%	29	42.03%	25	36.23%	4	5.80%	1	1.45%
5.0 Assessment and Evaluation	5.1	9	13.04%	12	17.39%	18	26.09%	28	40.58%	2	2.90%
	5.2	11	15.94%	14	20.29%	29	42.03%	11	15.94%	4	5.80%
	5.3	4	5.80%	13	18.84%	28	40.58%	18	26.09%	6	8.70%
	5.4	5	7.25%	14	20.29%	26	37.68%	19	27.54%	5	7.25%
6.0 Social, Legal, and Ethical Issues	6.1	2	2.90%	9	13.04%	12	17.39%	39	56.52%	7	10.14%
	6.2	13	18.84%	19	27.54%	27	39.13%	10	14.49%	0	0.00%
	6.3	13	18.84%	15	21.74%	29	42.03%	12	17.39%	0	0.00%
	6.4	9	13.04%	9	13.04%	27	39.13%	23	33.33%	1	1.45%
	6.5	2	2.90%	4	5.80%	9	13.04%	29	42.03%	25	36.23%

The table above represents all responses for section 3 of the survey in terms of frequencies and percentages. The numerical data are visually demonstrated and described for each category in figures 2 to 7 below.

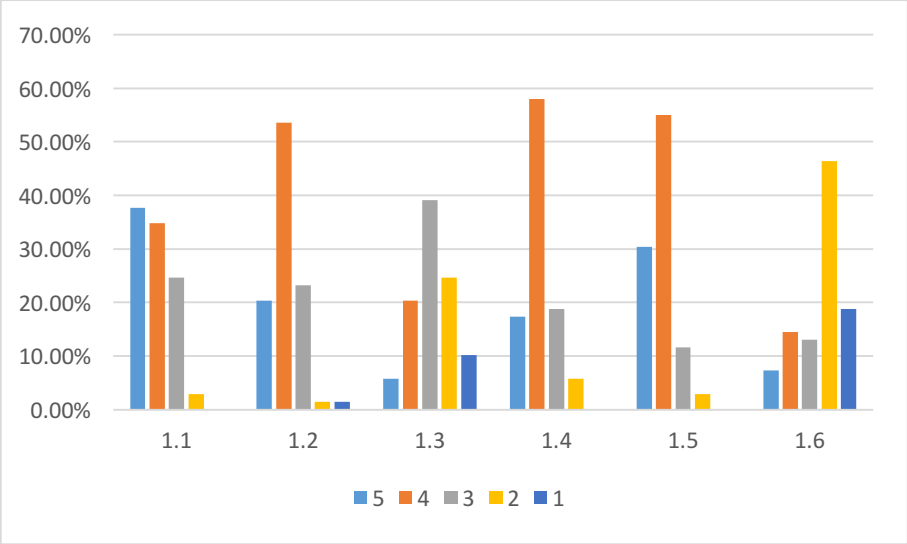

Figure 2 Leadership and Vision

The results of the first category, Leadership and Vision, indicated that sharing the use of technology vision with stakeholders was a common practice among participants (n=26, 37.68%) are always doing it and 34.78% are sharing the vision most of the times. Although participants (n=37, 53.62%) have plans aligned with the vision of implementing technology in their schools, only 5.8% of them used to take the risk of using new technologies. According to Dawson and Rakes (2003).

Another major result for the analysis of this category is the high percentage of participants (n=32, 46.38%) who are rarely involved in the district/schools' system educational technology policies and plans.

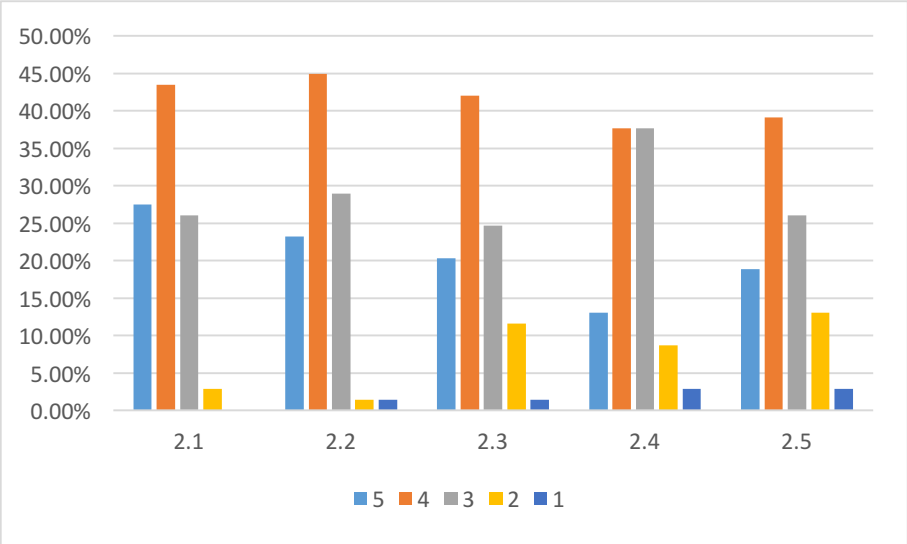

Figure 3 Learning and Teaching

Learning and Teaching category results proved more involvement of the participants in promoting and supporting the use of technology. More than 60% of them claimed that they facilitate and support the use of technology most often.

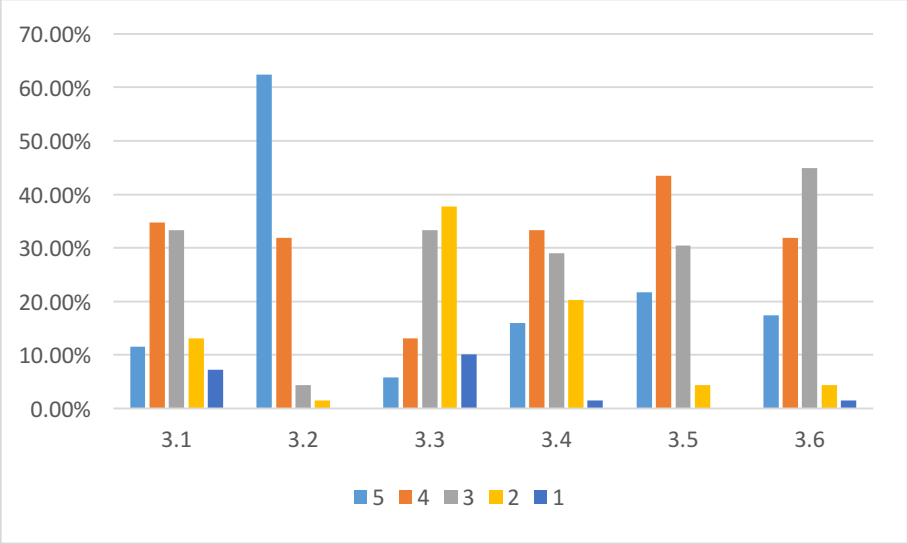

Figure 4 Productivity and Professional Practice

The third category focused on the productivity and professional practice. Participants (n=24, 34.78%) are modeling the effective use of technology and more than 90% of them use technology for communication with staff and the community. However, only 5.8% were always involved on professional communities to help teachers improve their technology productivity. 43.48% are promoting the use of technology most of the times and 44.93% use technology to develop the workplace.

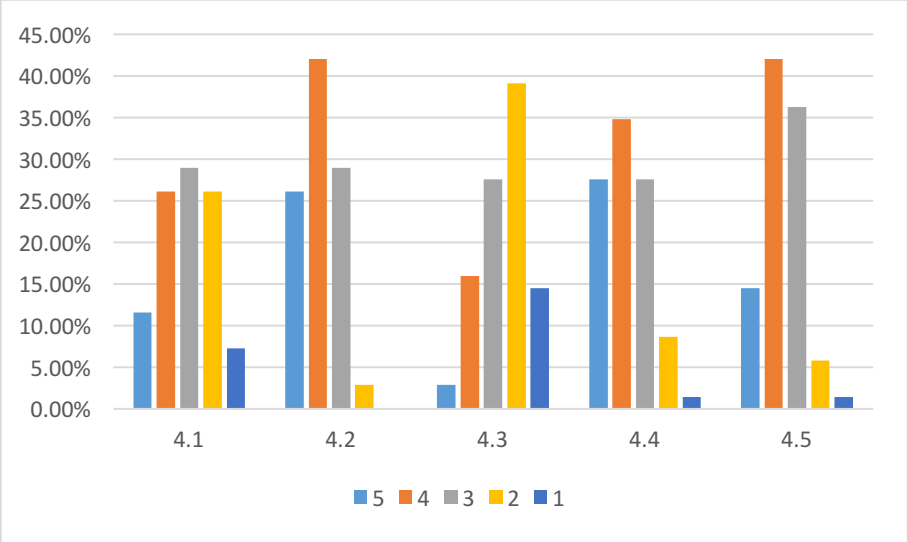

Figure 5 Support, Management, and Operations

Support, Management, and Operations were of less interest for principals and school leaders. Participants (n=27, 39.13%) rarely ensure communication with Human Resource and Finance departments with regard to technology integration. Nonetheless, 42.03% ensure continuous educational technology implementation. These results indicate that school leaders

are attentive to the internal school operations as instructional managers and are excluded from other administrative activities.

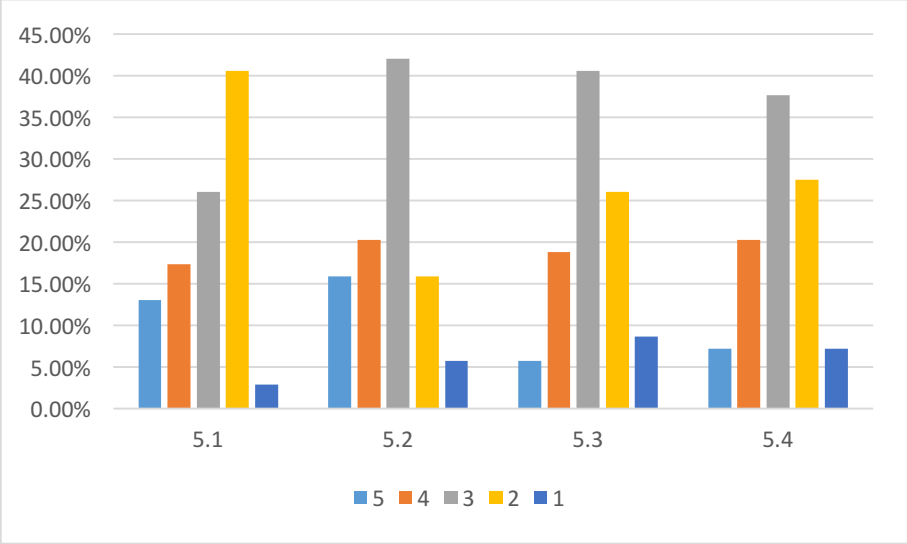

Figure 6 Assessment and Evaluation

The fifth category, Assessment and Evaluation, revealed more interesting results where one can find that participants (n=28, 40.58%) rarely evaluate the effectiveness of using technology. This signifies the gap between their optimistic vision and the need for more professional development in this domain. 40.5% of the respondents conduct staff needs' assessment and provide professional development accordingly some times.

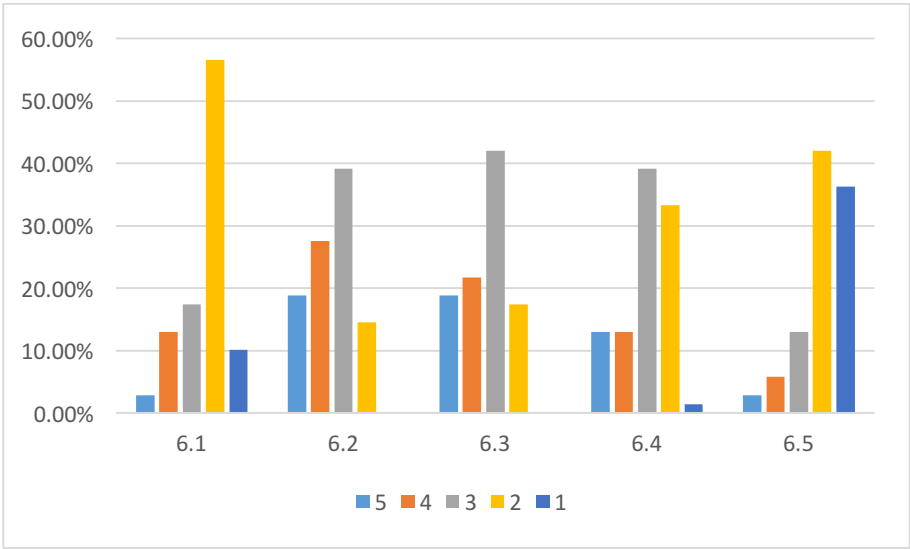

Figure 7 Social, Legal, and Ethical Issues

The elements of the Social, Legal, and Ethical issues category indicated less interest to ensure equity in accessing educational technologies within the school context with responses (n=39, 56.52%) rarely do that. Yet, 39.13% were promoting accountable use of technology

sometimes. Again, less surprisingly, less involvement of school leaders in creating policies to restrict plagiarism and intellectual property infringement was clearly indicated with 42.03% of the participants were rarely doing it and 36.23% have never been involved.

All results obtained from the statistical descriptive analysis answer the research questions 1 and 2.

4. 3 Inferential Statistical Analysis

The Statistical Package for the Social Science (SPSS) was used to perform complex data analysis of sections 1 and 3 of the survey. The datasheets generated by Google Forms were imported into SPSS software and data were manipulated. The *t*-test was used to compare the two means for the study of the significance of Gender as an independent variable. Whereas, one-way Analysis of Variance (ANOVA) was used to test the significance of the independent variables Age Range and Years of Experience. ANOVA test can tell if there are at least two different groups. However, to specify which group is different, Post hoc tests should be conducted. In addition to the study of the significance of the different variables, the inferential analysis allows for more objective results.

4.3.1 Significance of gender

The t-test was carried out to find if there exists a significant difference between male and female attitudes in using technology as school leaders. The test was conducted for each category separately. Table 8 summarizes these results.

Table 8 Attitudes of Male and Female

Category	Gender	N	Mean	SD	*t*	*p*
1.0	Male	41	3.829	1.16	0.665	0.74518
	Female	28	3.643	1.129		
2.0	Male	41	3.683	1.059	-1.542	0.0632
	Female	28	4.036	0.838		
3.0	Male	41	3.756	0.943	-0.951	0.17211
	Female	28	3.857	0.803		
4.0	Male	41	4.171	0.972	1.412	0.91815
	Female	28	3.786	1.198		
5.0	Male	41	3.976	0.851	2.308	0.9869

	Female	28	3.357	1.233		
6.0	Male	41	2.561	0.923	0.101	0.53977

For the sample data, The *t* value demonstrates the size of the difference relative to the variation $t(df)=p$, where df is the degree of freedom.

The results indicated that there exists no significant difference between male and female for the six categories 1.0, 2.0, 3.0, 4.0, 5.0, and 6.0. The significance level also showed a similar conclusion. However, for category 2.0 Learning and Teaching, a close value of p to 0.05 (p=0.0632, p>0.05) indicates a small difference. According to Johnson (1999) a small p-value (typically ≤ 0.05) indicates strong evidence against the null hypothesis. Hence the rejection of the null hypothesis.

Morris et al., (2005) pointed out that gender differences could be notified among older workers in terms of using technology. Though, a unisex pattern was obvious among younger workers. Gefen and Straub (1997) stated that female and male differ in their perception but not use of the email in the study technology acceptance model.

4.3.2 The Significance of Age Range differences

Table 9 shows the mean value of responses and the standard deviation for the six categories with reference to the age range.

Table 9 Attitudes of Groups of Different Age Range

Category	Age Range	N	Mean	SD
1.0	20-29	3	3.545	0.909
	30-39	27	3.638	1.012
	40-49	33	3.498	0.891
	50-59	6	3.505	1.002
	+60	0	0	0
2.0	20-29	3	3.69	0.892
	30-39	27	4.374	1.112
	40-49	33	4.082	0.824
	50-59	6	2.571	0.967
	+60	0	0	0

3.0	20-29	3	4.12	1.023
	30-39	27	4.021	0.945
	40-49	33	3.856	0.834
	50-59	6	3.001	0.798
	+60	0	0	0
4.0	20-29	3	3.233	0.923
	30-39	27	3.378	1.025
	40-49	33	4.012	1.238
	50-59	6	3.989	0.719
	+60	0	0	0
5.0	20-29	3	3.65	0.836
	30-39	27	3.492	0.998
	40-49	33	4.101	1.120
	50-59	6	2.476	0.899
	+60	0	0	0
6.0	20-29	3	2.21	0.819
	30-39	27	2.367	1.067
	40-49	33	3.029	0.955
	50-59	6	3.612	1.007
	+60	0	0	0

Consistent means were noticed for categories 1.0, 3.0, and 4.0. Unlikely, categories 2.0 and 5.0, which have shown a variation for the age, range 50-59 years old and the mea value was 2.572 and 2.476 respectively. On the contrary, for the category 6.0, the age rang 20-29 mean value were the minimum (M=2.21).

ANOVA analysis of means and standard deviation values is demonstrated in details below in table 10.

Table 10 ANOVA results for Attitudes of Groups of Different Age Ranges

Category		Sum of Square (SS)	Degree of Freedom (df)	Mean Square (MS)	F	*p*
1.0	Between Groups	0.309	3	0.103	0.114	0.951
	Within Groups	58.705	65	0.903		
	Total	59.014	68			
2.0	Between Groups	16.381	3	5.460	5.901	0.001
	Within Groups	60.144	65	0.925		
	Total	59.059	68			
3.0	Between Groups	5.330	3	1.777	2.275	0.088
	Within Groups	50.754	65	0.781		
	Total	56.084	68			
4.0	Between Groups	7.113	3	2.371	1.909	0.137
	Within Groups	80.729	65	1.242		
	Total	87.842	68			
5.0	Between Groups	15.471	3	5.157	4.690	0.005
	Within Groups	71.476	65	1.100		
	Total	86.947	68			
6.0	Between Groups	11.778	3	3.926	3.914	0.012
	Within Groups	65.197	65	1.003		
	Total	76.975	68			

For Category 1.0: Leadership and Vision, different age ranges have no significant difference (p=0.951, p>0.05) among the respondents' attitudes and that was determined by the value of F (F=0.114). However, for category 2.0, the value of p (p=0.001, p<=0.05) revealed that there exists a significant difference between the different age rages with reference to Learning and Teaching according to NETS-A standards model.

The age ranges have no significant differences for categories 3.0 Productivity and Professional Practice (p=0.088, p>0.05) and 4.0 Support, Management, and Operations (p=0.137, p>0.05). Nevertheless, a significant difference existed between the groups with

reference to categories 5.0 Assessment and Evaluation and 6.0 Social, Legal, and Ethical Issues with (p=0.005, p<=0.05) and (p=0.012, p<=0.05) respectively.

4.3.3 The Significance of Years of Experience Differences

The attitudes of the different groups in terms of years of experience is summarized in Table 11.

Table 11 Attitudes of Groups of Different Years of Experience

Category	Yrs. of exp.	N	Mean	SD
1.0	< 5 yrs.	2	2.349	0.788
	5-9 yrs.	15	3.563	1.167
	10-14 yrs.	17	3.280	0.954
	15-19 yrs.	23	3.978	0.891
	20-24 yrs.	8	3.890	0.998
	>= 25 yrs.	4	3.782	1.005
2.0	< 5 yrs.	2	3.459	0.936
	5-9 yrs.	15	3.657	0.967
	10-14 yrs.	17	3.681	0.967
	15-19 yrs.	23	4.003	0.891
	20-24 yrs.	8	3.892	0.992
	>= 25 yrs.	4	3.540	1.023
3.0	< 5 yrs.	2	3.902	1.08
	5-9 yrs.	15	4.109	0.921
	10-14 yrs.	17	4.108	0.884
	15-19 yrs.	23	3.893	0.879
	20-24 yrs.	8	2.821	0.901
	>= 25 yrs.	4	2.726	0.799
4.0	< 5 yrs.	2	3.462	0.945
	5-9 yrs.	15	3.671	0.898
	10-14 yrs.	17	3.990	0.991
	15-19 yrs.	23	3.856	1.167
	20-24 yrs.	8	3.604	1.201

	>= 25 yrs.	4	3.789	0.926
5.0	< 5 yrs.	2	3.267	0.962
	5-9 yrs.	15	3.531	0.789
	10-14 yrs.	17	4.120	0.929
	15-19 yrs.	23	3.921	1.034
	20-24 yrs.	8	3.672	1.229
	>= 25 yrs.	4	2.901	0.967
6.0	< 5 yrs.	2	2.341	0.892
	5-9 yrs.	15	2.382	0.791
	10-14 yrs.	17	2.412	0.911
	15-19 yrs.	23	2.621	1.026
	20-24 yrs.	8	3.061	0.991
	>= 25 yrs.	4	3.123	0.690

The attitudes of the education leaders with respect to the years of experience seemed to be different from the age range. Categories 2.0 and 4.0 implied coherent results, other categories were affected more significantly with refrence to the years of experience.

ANOVA analysis of means and standard deviation values is demonstrated in details below in table 12.

Table 12 ANOVA results for Attitudes of Groups of Different Years of Experience

Category		Sum of Square (SS)	Degree of Freedom (df)	Mean Square (MS)	F	*p*
1.0	Between Groups	8.830	5	1.766	1.803	0.125
	Within Groups	61.717	63	0.980		
	Total	70.547	68			
2.0	Between Groups	2.063	5	0.413	0.461	0.804
	Within Groups	56.422	63	0.896		
	Total	58.485	68			
3.0	Between Groups	15.546	5	3.109	3.907	0.004
	Within Groups	50.141	63	0.796		

	Total	65.687	68			
4.0	Between Groups	1.470	5	0.294	0.256	0.935
	Within Groups	72.298	63	1.148		
	Total	73.769	68			
5.0	Between Groups	7.062	5	1.412	1.475	0.211
	Within Groups	60.349	63	0.958		
	Total	67.412	68			
6.0	Between Groups	6.119	5	1.224	1.420	0.229
	Within Groups	54.296	63	0.862		
	Total	60.415	68			

In terms of years of experience, different groups showed almost no significant difference except for category 3.0 Productivity and Professional Practice (p=0.004, p<=0.05). This indicates that different groups have variant use of technology for productivity and professional practice.

Chapter 5: Conclusions

This paper introduced a study of the education leaders' attitudes in terms of technology use. The tools that are mostly used were identified. Moreover, an inferential statistical study of the different variables including gender, age range and years of experience was conducted to prove or reject the hypotheses stated at the beginning of this research. The findings of this research are based on the quantitative approach. An in-depth reading of literature led to theoretical findings while empirical findings were associated with the survey results.

5.1 Theoretical Findings

A list below concludes the theoretical findings based on the reviewed literature:

- Planning to have proper technology integration requires shared vision which is critical according to Costello (1997). Anderson and Dexter (2000) pointed out a structure for the Taxonomy of Educational Technology Leadership Decisions based on strategic planning and vision sharing, budgeting, organizational structures, curriculum, assessment, and other external and ethical issues.
- Education leaders need to develop an understanding of the 21st century skills and align them with the technology-immersed generation needs. Grady (2011) stated that technology is nothing but a tool used to do work and achieve goals. Thus, knowing how to use this tool competently would help school leaders achieve their goals and have quality-learning processes inside the classrooms.
- Educational Technology leadership standards need to be internationally identified; NETS- can be the basis to create one. The idea was supported by Davies (2010).
- The digital revolution has a global reach and an inherently cross, potentially involving all disciplines, all educators.
- The 'distribution' of most disciplines of training related to new media also presents problems: first, seems to assume a faculty uniformly equipped with the necessary skills to use new technology in education, and in turn to train students to use them. It is no use denying, however, that the situation is not so rosy. Furthermore, an approach of this kind seems to functional training in the use of new technologies, but it seems difficult to reconcile with the need for a study, although introductory, of the fundamentals of their

operation. Each of the options considered thus presents advantages and disadvantages (Wang, 2014, p.256).

- Educational technology is the result of practices of different educational concepts and theories to solve a range of problems and issues related to teaching and learning, supported by the ICT (information and communication technologies). It is understood by educational technology scientific approach based on systems theory it provides the educator planning tools and development through technological resources in order to improve the teaching and learning maximizing the achievement of educational goals and looking learning effectiveness.
- Considering the educational level is the result of the applications of different educational concepts and theories to solve a range of problems and issues related to teaching and learning, supported by technology information and communication. The goal of educational technology is the teaching and learning.
- Educational Technology, as a pedagogical discipline, should establish a passage between instructional theories based on behaviorism, it has recovered the elements of the new paradigms of social sciences and the critical elements of the curriculum, moving from building materials only provide information to development learning object-based learning sequences.
- The use of technological tools is an excellent support for students when they are raised to generate their own knowledge and develop strategies for autonomous learning (Wang, 2014, p.265).

5.2 Empirical Findings

The descriptive analysis of the survey results led to the following empirical findings:

- Education leaders use technology tools for different purposes; presentation, file management, communication, classroom evaluation and for feedback collection.
- Participants of the survey tend to stay on the basic level with reference to SAMR model to substitute the traditional tool with minimal functional improvement. Only for file management, educators tend to use Google drive or dropbox. Romrell, Kidder, and Wood (2014) stated that SAMR model provides a framework to evaluate mLearning activities. Hence, SAMR model can be used to develop an instrument or an appraisal form to evaluate the use of technology.

The inferential statistical analysis revealed that:

- Gender has almost no significant effect on the use of technology for all categories according to NETS-A standards. It was a small difference only for the category 2.0 Learning and Teaching. Eagly and Johnson (1990) stated that unlike the stereotypic expectation of the leadership style the hypothesis of the interpersonally-oriented style for women and the task-oriented style for men is rejected.
- The Age range groups have shown significant difference in terms of Learning and Teaching, Assessment and Evaluation, and Social, Legal, and Ethical issues. However, for Leadership and Vision, Productivity and Professional Practice, and for support, Management and Operation were not affected. Previous research pointed out no significant effect of age difference on the attitudes in using technology, yet, experienced people would show amenity, and more productivity in this regard (Czaja and Sharit , 1998). This implies a significant need for more professional development for principals and school leaders. Better preparation for the role is a necessity in order to have a well managed contextual technology integration.
- Another important finding is the need to involve school leaders in creating policies and plans for technology integration.
- The distance between the instructional managers and both human resource and financial departments lead to mismatch in plans and have contradictory visions. More coordination is required. That was clearly indicated by the no significant differences between the different groups for category 6.0 Social, Legal, and Ethical Issues with average means (M=2.561) and (M=2.536) for male and female participants respectively.

5.3 Implications of the Study

There are different aspects to highlight in relation to the implications of the study. The study would reveal more reliable and generalizable results if the sample size was larger. A larger population could be targeted if the study was conducted in other emirates or probably other countries. School leaders need to be supported by their upper management. Administrators will, in turn, be able to support teachers and contribute to school policies (ISTE, 2015).

The lack of instructional technology courses in the stage of preparing of education leaders is confirmed. ISTE(2001) stated that more school improvement could be achieved if school leaders are capable of using technology in school operations and use the retrieved data about technology usage. Thus, the need to have technology standards for administrators becomes a necessity. Education leaders need to model the best practices (McLeod and Richardson, 2011).

A research conducted by Peterson (2000) about the importance of preparing school leaders to use technology, showed that more courses and more research need to be conducted for them. Huge efforts are being paid in the same field now, yet, no considerable change can be detected.

5.4 Recommendations

Technology integration effectiveness can be detected by the technology leadership style. The education leaders' attitudes should reflect less reluctance to change and work to improve their professional practices.

A deeper statistical study of the relationship between dependent and independent variables would help to identify the differences between two or more groups (McMillan & Wergin, 2009). Moreover, a comprehensive study of other demographic data for participants such as their qualifications, and interests can be conducted. Pot-hoc comparisons are recommended.

A set of benchmarks can characterize technology leadership in schools. Reluctance of administrators to improve should be resolved by exposing them to rigorous professional development programs and address their competencies. More involvement in creating policies and technology integration plans is highly recommended.

In addition to strategic planning targeting to improve the higher education sector and revamp their readiness for the transition into the new 21st century qualities. More interdisciplinary courses need to be included in the preparation stages of principals and school leaders. Thus, a paradigm shift.

5.5 Scope of the Study

The researcher found genuine reasons to continue this research and conduct broader, yet, deeper study of its variables. Further aspects can also be investigated such as a detailed analysis of the best leadership style for better technology integration.

5.6 Concluding Note

The study aimed to answer the three research questions prove or reject the hypotheses. Based on the theoretical exploration and empirical findings it was concluded that technology tools used by school leaders mostly reflected a substitution of the conventional tools. According to Work (2014), tools for modification and redefinition are not widely used.

A set of standards need to be implemented to establish proper technology integration and to improve technology leadership effectiveness. Standardized benchmarked criteria for selecting technology leaders would ensure promising results. NETS-A and SAMR model can be used to generate those criteria.

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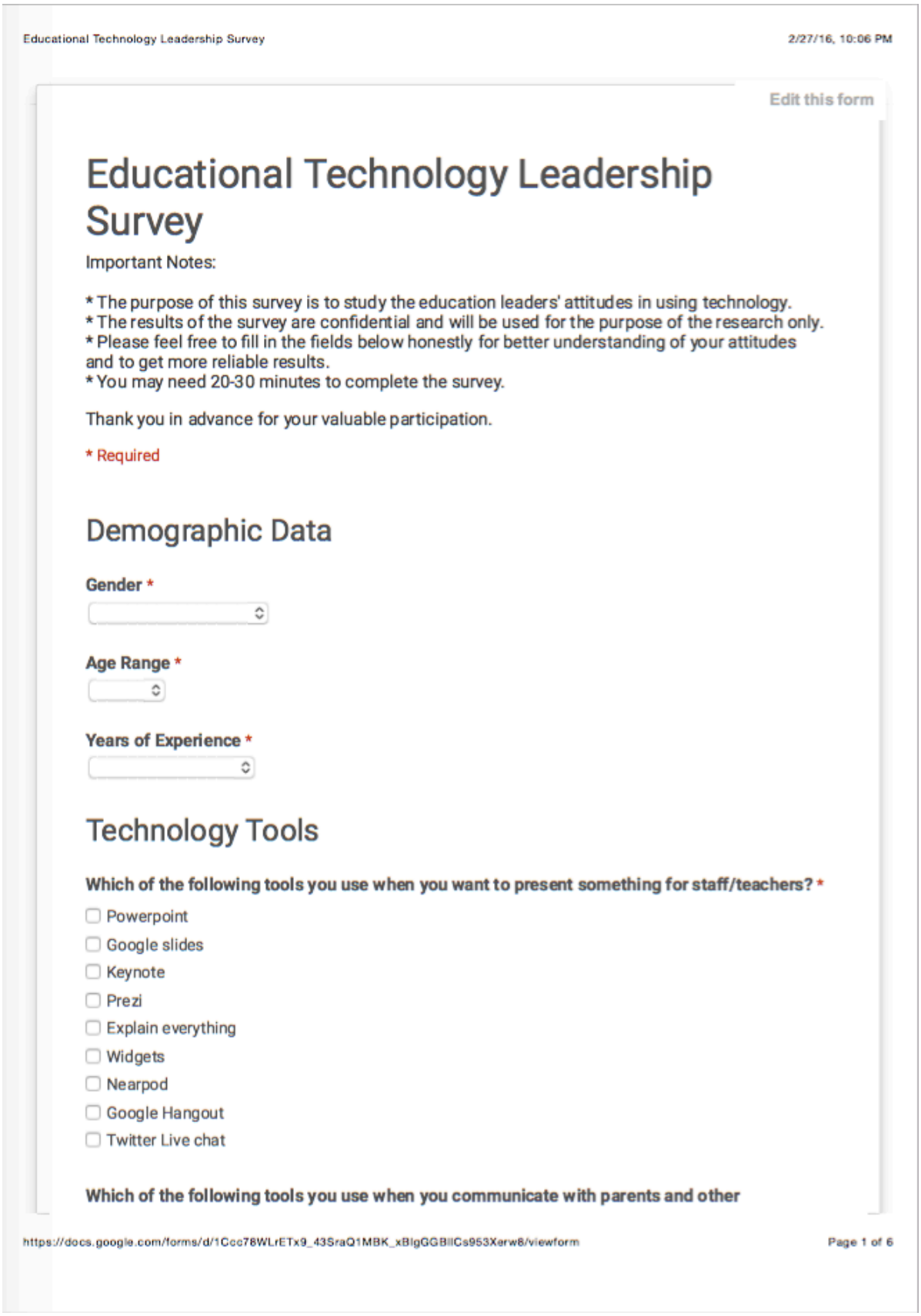
Appendix A



Edit this form

Educational Technology Leadership Survey

Important Notes:

* The purpose of this survey is to study the education leaders' attitudes in using technology.
* The results of the survey are confidential and will be used for the purpose of the research only.
* Please feel free to fill in the fields below honestly for better understanding of your attitudes and to get more reliable results.
* You may need 20-30 minutes to complete the survey.

Thank you in advance for your valuable participation.

* Required

Demographic Data

Gender *

Age Range *

Years of Experience *

Technology Tools

Which of the following tools you use when you want to present something for staff/teachers? *

- [ ] Powerpoint
- [ ] Google slides
- [ ] Keynote
- [ ] Prezi
- [ ] Explain everything
- [ ] Widgets
- [ ] Nearpod
- [ ] Google Hangout
- [ ] Twitter Live chat

Which of the following tools you use when you communicate with parents and other

community members? *

- [ ] Email
- [ ] Website
- [ ] Google Drive
- [ ] School Wide Remind account
- [ ] Aurasma
- [ ] Twitter
- [ ] Symbaloo Page
- [ ] Create QR codes to post around the school and/or community for sharing information.
- [ ] Twitter Live Chat

How do you manage your files? *

- [ ] Attach a document to an email.
- [ ] Save a document to a flash drive.
- [ ] Save a document to a school computer.
- [ ] Upload to Dropbox.
- [ ] Upload to Google Drive.
- [ ] Share folders and files on Google Drive.
- [ ] Share folders and files on Dropbox.
- [ ] Upload data and use Google Analytics to analyze school information.
- [ ] Using Google Drive, allow others to edit, comment on, and share your documents.
- [ ] Administrators share data and converse digitally for articulation meetings.

Which of the following tools you use for classroom evaluation? *

- [ ] Take notes using MS Word on a laptop.
- [ ] Take notes using a mobile device or tablet.
- [ ] View the lesson plan as an email attachment.
- [ ] Review the lesson plan on a mobile device during an observation.
- [ ] Record the lesson plan using a mobile device.
- [ ] Share the lesson plan and evaluation on Google Drive.
- [ ] Embed a recorded lesson plan within your evaluation.
- [ ] Meet with the teacher in a Google Hangout for the post-observation.
- [ ] Collaborate on the lesson plan and evaluation using Google Drive.

Which of the following tools you use collect input or feedback from staff? *

- [ ] Email ideas.
- [ ] Submit feedback and ideas using Google Forms.
- [ ] Use Poll Anywhere to receive input from staff.
- [ ] Share a Google Form spreadsheet and use comments to generate discussion.
- [ ] Use Google Chat for digital communication.

- [ ] Use collaborative mind maps to drive discussion.
- [ ] Collaborate on Google Docs.
- [ ] Share information with other administrators using Google Drive.

Knowledge & Practice

Leadership and Vision *

	Always	Most of the times	Sometimes	Rarely	Not at all
I share effective technology use vision with all stakeholders	○	○	○	○	○
I have plans to implement educational technology that are aligned with the vision	○	○	○	○	○
I take the risk of using new technologies and advocate its policies.	○	○	○	○	○
I use data for technology use decision-making	○	○	○	○	○
I encourage staff to share best practices based on research results	○	○	○	○	○
I am involved in the district/schools' system educational technology policies and plans	○	○	○	○	○

Learning and Teaching *

	Always	Most of the times	Sometimes	Rarely	Not at all
I promote the use of educational technology to improve students results	○	○	○	○	○
I support innovative collaborative technology use to	○	○	○	○	○

improve learning in the classrooms					
I facilitate the use of educational technology in a student-centred classrooms	○	○	○	○	○
I facilitate the use of educational technology to enhance the students' high order thinking	○	○	○	○	○
I help teachers gain professional teaching and learning experience using educational technology	○	○	○	○	○

Productivity And Professional Practice *

	Always	Most of the times	Sometimes	Rarely	Not at all
I model the effective use of educational technologies	○	○	○	○	○
I use technology to communicate with the staff and the community	○	○	○	○	○
I am involved in professional communities to help teachers improve their productivity	○	○	○	○	○
I seek professional development through professional learning communities	○	○	○	○	○
I promote new educational technologies and advocate it use	○	○	○	○	○
I use technology to develop my workplace	○	○	○	○	○

Support, Management, And Operations *

	Most of the

	Always	times	Sometimes	Rarely	Not at all
I create policies and set rules to use appropriate educational technologies in the classroom	○	○	○	○	○
I use technology to operate my school/institute	○	○	○	○	○
I ensure coordination between Human Resource and Financial departments for continued technology implementation	○	○	○	○	○
I align the efforts of the different departments in my school/ organization/ institute for effective educational technology implementation	○	○	○	○	○
I work to ensure continuous educational technology implementation	○	○	○	○	○

Assessment and Evaluation *

	Always	Most of the times	Sometimes	Rarely	Not at all
I use different ways to evaluate the effective use of educational technologies	○	○	○	○	○
I use technology to collect and analyze data and use their findings to improve teaching and learning in the classrooms.	○	○	○	○	○
I conduct staff needs' assessment and provide professional development accordingly	○	○	○	○	○
I use various technology tools to evaluate and control operations in my school/organization/institute.	○	○	○	○	○

Social, Legal, and Ethical Issues *

	Always	Most of the times	Sometimes	Rarely	Not at all
I ensure equal access to educational technologies required for teaching and learning	○	○	○	○	○
I promote accountable use of technology in my school/organization/institute	○	○	○	○	○
I enforce safe and secure use of technology in my school/organization/institute	○	○	○	○	○
I ensure the use of ergonomics to maintain staff/ teachers' healthy habits	○	○	○	○	○
I am involved in creating policies to restrict plagiarism and intellectual property infringement	○	○	○	○	○

Submit