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# PRINCIPALS' INTEGRATION OF TECHNOLOGY IN EDUCATION AT SHARJAH CITY GOVERNOMENT SCHOOLS

Samer Husni Abdel Khaleq Alsaleh

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United Arab Emirates University

College of Education

Department of Educational Leadership

**PRINCIPALS' INTEGRATION OF TECHNOLOGY IN EDUCATION  
AT SHARJAH CITY GOVERNOMENT SCHOOLS**

Samer Husni Abdel Khaleq Alsaleh

This thesis is submitted in partial fulfillment of the requirements for the degree of  
Master of Education (Educational Leadership)

Under the Supervision of Dr. Ali Ibrahim

December 2014

### **Declaration of Original Work**

I, Samer Husni Abdel Khaleq Al Saleh, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this Master thesis entitled “*Principals’ Integration of Technology in Education at Sharjah City Government Schools*” hereby, solemnly declare that this thesis is an original research work that has been done and prepared by me under the supervision of Dr. Ali Ibrahim, in the College of Education at UAEU. This work has not been previously formed as the basis for the award of any academic degree, diploma, or a similar title at this or any other university. The materials borrowed from other sources and included in my thesis have been properly cited and acknowledged.

Student’s Signature \_\_\_\_\_ Date \_\_\_\_\_

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## **Abstract**

School leadership includes several elements; one of them is technology leadership that is necessary for the success of technology integration in education. The purpose of this study is to describe the state of technology integration in Sharjah City Government Schools based on a juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions. This technique of study would help in reaching a more trusted image of technology integration at Sharjah schools. The second purpose was to investigate the influence of the principals' gender on integrating technology in their schools, in addition to identify the main challenges that faced Sharjah government schools' principals in integrating technology in their schools. The descriptive approach was used to collect the quantitative data through administering the Educational Technology Survey for principals and teachers. A sample of 34 government school principals and 344 teachers responded to the survey. The findings indicated that a difference exists between principals' and teachers' perceptions of Sharjah City government school principals' ability to integrate technology in their schools based on National Educational Technology Standards for Administrators (NETS-A). Standard I (Visionary Leadership) was the least level achieved in comparison to the other standards. Moreover, gender had a significant difference just in Standard II "Digital Age Learning Culture" in the favor of female. The high cost of integrating technology and lack of funding, continuous production of new technology tools and the inability to cope with them, lack of professional development programs, and lack of skilled and qualified teachers in integrating technology were the most important challenges that faced Sharjah City principals in integrating technology in their schools.

## دمج مديري المدارس الحكومية بمدينة الشارقة للتكنولوجيا في العملية التعليمية

### الملخص

ينطوي تحت قيادة المدرسة الفاعلة عناصر عدة، ومن أحد تلك العناصر قيادة التكنولوجيا التي تعتبر مهمة جدا لضمان نجاح دمج التكنولوجيا في التعليم. الغرض من هذه الدراسة هو وصف واقع دمج مدارس الشارقة الحكومية للتكنولوجيا من وجهة نظر مديري المدارس ومعلميها. الغرض الثاني من الدراسة هو استكشاف أثر متغير نوع جنس المدير على دمج التكنولوجيا في مدارسهم، بالإضافة لتحديد التحديات الرئيسية التي تواجه مديري مدارس مدينة الشارقة الحكومية في دمج التكنولوجيا في التعليم.

تم استخدام منهجية البحث الوصفي لجمع البيانات الكمية من خلال تطبيق استبانة قيادة التكنولوجيا على كل من مديري المدارس والمعلمين. واشتملت عينة الدراسة على 34 مديراً و344 معلماً. دلت النتائج على وجود اختلاف بين مدرّاء المدارس والمعلمين في تصوراتهم عن قدرة مدرّاء مدارس مدينة الشارقة الحكومية على دمج التكنولوجيا في التعليم بناء على معايير قيادة التكنولوجيا الخاصة بالإداريين (NETS-A). وقد كان المعيار الأول " القيادة ذات رؤية" اقل تحقيقاً من بين المعايير الخمسة. ودلت النتائج كذلك على أنه يوجد فرق بناء على نوع الجنس لصاح الإناث في المعيار الثاني " ثقافة التعلم في العصر الرقمي". ويرى مديرو المدارس أن أهم التحديات التي تواجههم في دمج التكنولوجيا في مدارسهم تتمثل في: ارتفاع كلفة دمج التكنولوجيا وقلة التمويل، التجدد المستمر لأدوات التكنولوجيا وضرورة المواكبة، قلة برامج التنمية المهنية في استخدام التكنولوجيا، وضعف مهارات المعلمين في دمج التكنولوجيا.



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The completion of this thesis took hundreds of hours away from my duties as husband and father. I must acknowledge the enormous support, assistance, and encouragement provided to me by an incredibly understanding and loving wife. Thanks Badera for your patience and your prodding. I also acknowledge my precious kids Omar, Obada, and Layan who shared the journey with me. I love you all and appreciate your understanding and patience. I absolutely could not have completed this without you.

## **Dedication**

This thesis is dedicated

To the spirit of my beloved mother Allah rest her soul.

To my dear father, who prays for me to be always distinguished.

To my wife and soul mate, who patiently provided me with enduring love and  
steadfast support throughout this journey.

To my sons Omar and Obada and to my lovely daughter Layan Allah bless them.

## Table of Contents

Title .....	i
Declaration of Original Work.....	ii
Copyright.....	iii
Approval of the Master Thesis .....	iv
Abstract .....	vi
Title and Abstract in Arabic .....	vii
Acknowledgments .....	viii
Dedication .....	ix
Table of Contents.....	x
List of Tables.....	xiii
 CHAPTER 1: INTRODUCTION.....	 1
1.1 Background .....	1
1.2 Statement of the Problem.....	5
1.3 Purpose of the Study.....	6
1.4 Research Questions.....	7
1.5 Significance of the Study .....	7
1.6 Limitations of the Study.....	8
1.7 Assumptions of the study.....	8
1.8 Definition of Terms and Acronyms .....	9
1.9 Organization of the Study .....	10

CHAPTER 2: LITERATURE REVIEW .....	11
2.1 Leadership and Technology .....	12
2.2 Technology leadership .....	16
2.3 Standards .....	18
2.4 Standards in Education .....	19
2.5 Technology Standards.....	21
2.6 National Educational Technology Standards for Administrators (NETS-A).....	22
2.7 Educational Technology in the UAE Context.....	34
2.8 Previous Studies .....	40
CHAPTER 3: METHODOLOGY .....	50
3.1 Research Design .....	51
3.2 Population of the Study.....	51
3.3 Sample of the Study.....	52
3.4 Instrumentation.....	53
3.5 Data Collection Procedures.....	56
3.6 Data analysis procedures.....	57
3.7 Ethical considerations .....	58
3.8 Delimitation and Limitation .....	59
CHAPTER 4: RESULTS OF THE STUDY .....	60
4.1 Technology integration in Sharjah Government Schools.....	60
4.2 Differences in Technology Integration Based on the Gender of Principals .....	76

4.3 Challenges Facing Sharjah School Principals in Integrating Technology .....	78
CHAPTER 5: DISCUSSION AND RECOMMENDATIONS .....	80
5.1 Discussion of Research Question 1 .....	80
5.2 Discussion of Research Question 2 .....	89
5.3 Discussion of Research Question 3 .....	91
5.4 Implications and Recommendations .....	93
Bibliography .....	96
Appendix A .....	107
Appendix B.....	110
Appendix C.....	112
Appendix D .....	114
Appendix E.....	116
Appendix F.....	121
Appendix J.....	123

## List of Tables

Table 1: Population number of principals and teachers by gender.....	52
Table 2: Distribution of Principals' and Teachers' Gender .....	53
Table 3: Cronbach Alpha Coefficients for principals sample .....	55
Table 4: Cronbach Alpha Coefficients for teachers sample.....	56
Table 5: Descriptive Statistics –Principals’ Perceptions of the Visionary Leadership	62
Table 6: Descriptive Statistics -Principals’ Perceptions of Digital Age Learning culture.....	63
Table 7: Descriptive Statistics –Principals’ Perceptions of Excellence in Professional Practice .....	64
Table 8: Descriptive Statistics –Principals’ Perceptions of Systemic Improvement...	65
Table 9: Descriptive Statistics –Principals’ Perceptions of Digital Citizenship .....	67
Table 10: Descriptive Statistics –Teachers’ Perceptions of the Visionary Leadership	68
Table 11: Descriptive Statistics –Teachers’ Perceptions of Digital Age Learning Culture.....	70
Table 12: Descriptive Statistics –Teachers’ Perceptions of Excellence in Professional Practice .....	71
Table 13: Descriptive Statistics –Teachers’ Perceptions of Systemic Improvement ..	73
Table 14: Descriptive Statistics –Teachers’ Perceptions for Digital Citizenship.....	74
Table 15: Cumulative means for the five scales from pricipals' and teachers' views..	75
Table 16: Frequency of the challenges as it mentioned by principals .....	79

## CHAPTER ONE: INTRODUCTION

### Background

The last decade witnessed an enormous knowledge and technology explosion. The use of technology became widespread in all facets of societies and by all classes. No one can deny the massive reliance and adoption of technology in business, industry, commerce, health care, and education sectors (Garland & Tadeja, 2013). The growth in using technology has been attributed to what technology is able to offer in facilitating businesses, which led to raising the investment in technology to unprecedented rates (Abo Jaser, 2012).

Technology products have shifted from being needed to being wanted and what was regarded as complementary and accessories now became basic life requirements. However, attention should be given to arrive at acceptable uses of technology at home, schools, hospitals, and businesses (Naser, Aber, Jaber, & Saeed, 2013). Technology and the virtual world became part of current students' lives to the point that it seems impossible for them to live without technological devices (Tamim, 2013). Thus, the interest of this generation should be invested properly through utilizing technology as learning tools for gaining knowledge besides books, teachers, and other resources (Ali, 2013).

In schools, the interest in integrating technology tools/devices in the learning process has grown greatly. Budgets for technology increased in significant rates to provide necessary infrastructures to facilitate using these tools (i.e., networks, software, hardware, websites, and handheld devices) (Saleh, 2011).

School principals play an essential role in advancing technology integration in schools. Indeed, technology leadership has significant success in promoting technology integration more than technology infrastructure and expenditures (Anderson & Dexter, 2005).

A strong and effective educational leadership is necessary to the success of all school operations performance, plans, and initiatives based on technology. This leadership is responsible for leading technology integration in education through creating new visions and articulating norms and values that shape a new culture which school members can believe in and act upon. To integrate technology in schools properly, all educational leaders at all levels should possess a clear understanding of and enough acquaintance with the uses of technology from the perspective of all stakeholders in the school (Eren , Kurt, & Askim, 2011).

School leaders' technological skills, roles, and behaviors are the core components of effective technology leadership that is necessary for leading the integration of technology in their school. Technology leadership is a combination of general techniques and strategies with some specifications including the use of new knowledge, skills, and understanding of how technology can improve instructional practices and the administrative processes (Staples, Pugach, & Himes, 2005).

Many developed countries invest heavily in technology to enhance education. However, the information that supports the potential benefits of using technology is still limited, and the actual evidence of their effects is controversial. This highlights a need for more research and effort to arrive at internationally compatible standards and methodologies to provide better benefits for technology integration in schools (Rivard, 2010).



The notion of standards for developing educational practices had emerged during the last few decades as one mechanism to help policymakers and practitioners to align their education systems along internationally-recognized criteria. Many studies indicated the positive influence of standards on all components of educational systems starting from educational policies, accounting systems, curriculum, methods of teaching, school administration, the learning environment, and using technology in education. It is evident that standardization of education is a strong movement and research studies in many countries have led to creating standards-based education systems (Garland & Tadeja, 2013).

In line with the standardization movement, the researcher believes that it is necessary to adopt international standards to regulate the use of technology in education by all stakeholders in the school. Several international educational organizations and institutions provide principles and criteria in accordance with scientific methodologies to keep pace with the technological evolution (Saleh, 2011).

In order to understand the magnitude of this topic, it is worth mentioning some international experiences regarding technology standards in education. In the USA, the International Society for Technology in Education (ISTE) developed technology leadership standards in 2001, which was named the National Educational Technology Standards for Administrators (NETS-A). These standards cover five major areas: 1) visionary leadership, 2) digital-age learning culture, 3) excellence in professional practice, 4) systemic improvement, and 5) digital citizenship (ISTE, 2009). The recent NETS-A standards include roughly all suggestions made by writers and researchers in the field of technology leadership (See chapter 2 for more details). The ISTE distributes publications for promoting these standards. These standards are considered indicators for efficient technology leadership in education.

The Ministry of Education (MoE) and Abu Dhabi Education Council (ADEC) as well as other Educational Councils within the UAE are focusing on integrating technology in schools. In addition, they built bundles of policies and regulations to facilitate and organize the operations of using technology. These policies consider that school principals are responsible for driving technology integration in their schools and for creating an environment that supports all stockholders to foster technology in their duties and practices (ADEC, 2012; MoE, 2008).

In fact, professional qualifications of UAE school principals now include their ability to use and integrate technology in education. The policies ask school leaders to encourage teachers to embed technology in their classrooms as a means for learning (ADEC, 2012; MoE, 2008).

The tendency toward using and integrating technology is worthwhile. However, specialized standards for adopting technology in UAE schools do not exist. In other words, the MoE and ADEC do not adopt clearly-stated and specified standards for integrating technology in schools or for assessing the efforts of its integrating and its impact on student learning. Lack of standards means the absence of formal reference for school administrators in employing technology in all schools' operations. Thus, according to the researcher's knowledge, there are no studies conducted nor indicators reached for technology leadership success within the UAE context.

This study postulates, based on previous research (Alsaygh, 2004) that the provision of technology standards will assist in regulating school administrators'

roles and guide them for best practices in integrating technology in administrative work as well as in teaching and learning.

### **Statement of the Problem**

In its plans and policies for developing the educational system of the UAE, the MoE directs school principals to uptake ICT in education through encouraging faculty members to increase their use of technology in classrooms and through providing a suitable physical environment (ADEC, 2012; MoE, 2008). In addition, ADEC has developed electronic infrastructure to computerize administrative work of schools such as the use of e-mail in correspondence, using the Electronic Student Information System (ESIS), the Electronic Personnel Affairs System, and others.

However, the policies and regulations of MoE and the ADEC about using technology in education by administrators were not sufficient, as they are considered general organizing policies. In other words, they do not provide clear procedures, tasks, and action steps for administrators to integrate technology in their schools. In fact, school principals are left to develop their own procedures and mechanisms for embedding ICT in their schools, based on trial and error. In a system of education where historically principals and other educators were provided ample support in every aspect of their work, this seems not to be working. School principals feel they are in a state of embarrassment and tension, and they become stressed about motivating teachers toward embedding ICT in instruction.

The lack of specific guidelines, standards, or benchmarks to support them practically in integrating technology in leadership is reflected in the reality of school operations. Most school principals focus on technology supply rather than provision of clear visions and long-term plans. The existing forms of ICT integration in most

schools is merely the efforts of some interested or enthusiastic teachers for using technology in instruction. Therefore, unless administrators and teachers recognize the value and importance of ICT, efforts will remain sporadic and scattered.

Recently, discussions about using educational technology have emerged. Some school principals believe that teachers refuse their use of technology for different excuses. Principals doubt the teachers' knowledge of how to run technology tools, consequently, they are afraid of unexpected crashes and the lack of budget for maintenance. In fact, some principals boast that they kept technological devices for a long time, not recognizing that technology will be outdated within a few years. Other principals believe that some teachers are lazy, and some apologize for using educational technology due to lack of knowledge (Alsaygh, 2004).

Most previous studies in the UAE or other Gulf countries focused on either the roles or practices of teachers in using technology. They stayed mostly away from roles and practices of school administration. Therefore, there is a noticeable knowledge gap between international literature regarding the practices and roles of school principals in using ICT in education and real practices in the Gulf countries. This study is an attempt to fill in this gap.

### **Purpose of the Study**

This study had multiple purposes. The first one was to describe the state of technology integration in Sharjah City Government Schools based on a juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions. This technique of study would help in reaching a more trusted image of technology integration at Sharjah schools. The second purpose was to

investigate the influence of the principal gender on integrating technology in their schools. The final purpose of this study was to identify the main challenges that faced Sharjah Government Schools' Principals in integrating technology in their schools.

### **Research Questions**

Based on the purposes of the study, this study aimed to provide answers to the following research questions:

1. How do principals and teachers view the integration of technology in Sharjah Government Schools?
2. Were there any significant differences in technology integration based on the principal gender?
3. What were the main challenges that face Sharjah School Principals in integrating technology in their schools?

### **Significance of the Study**

This study was significant due to the apparent lack of literature and research on the topic of the study in the Gulf Countries in general and in the United Arab Emirates in particular. Therefore, this research bridges a gap in knowledge about this issue in the UAE. The results of this study were significant for researchers who could conduct further research in this area. The participation of school administrators and teachers in this study would increase their knowledge about technology leadership and might help in changing their practices of using ICT when they learn about international standards. The study also provided suggestions and recommendations to activate and strengthen the role of school principals in integrating educational

technology in their schools. The recommendations of the study could help policymakers resolve some concerns regarding integration of technology administrative work and in the learning process in general through well-defined standards.

### **Limitations of the Study**

This study was limited by time and context. The study was carried out in the third semester of the academic year 2013/2014. Therefore, the study reported on the state of technology during this academic year. This is important to mention since technology and its related policies are changing every day. The study was also limited to Sharjah City Government Schools in all cycles and grades except the kindergarten level. Therefore, the results should not be generalized to all schools in Sharjah, not to mention to all schools in the UAE. The study was limited by the content as it investigated technology integration through the National Educational Technology Standards for Administrators (NETS-A) which were used as benchmarks for creating the study tools. Another limitation of this study was the possibility that some participant might not have dealt with the survey seriously, some did not complete all questionnaire items, and others choose the same response for some parts or items.

### **Assumptions of the study**

- Principals and teachers were honest and truthful in responding to items on the survey.
- There is a lack of studies about technology leadership in the Gulf region in general and in the United Arab Emirates in particular.

- The quantitative approach to research, the one that is adopted in this study, was the best approach to handle the problem of the study.

### **Definition of Terms and Acronyms**

- *Technology*: Generally refers to personal computers, networking devices and other computing devices (e.g., electronic whiteboards and personal digital assistants (PDAs)); also includes software, digital media, and communication tools such as the Internet, e-mail, calling systems, CD-ROMs, and video conferencing.
- *ICT*: Information Computer Technology: It is a diversity of technology tools and resources used to communicate, create, store, and manage information (Hew & Brush, 2007).
- *Educational technology*: is related to a wide range of computer-related equipments, operating systems, networking, and software tools that provide the infrastructure, where the instructional and school administration' operations are working (Hew & Brush, 2007).
- *Technology planning*: Any process by which multiple stakeholder groups (e.g., school administration, faculty, and parents) convene to develop a strategy for the use or expanded use of technology in instruction and operations.
- *NETS-A*: National Educational Technology Standards for Administrators, which were published by ISET in (2001) and were edited in (2008) (ISTE, 2009).
- *Sharjah City Government Schools*: All government schools that follow the Ministry of Education for all cycles and stages except kindergartens and are located in Sharjah City in the UAE.

- *Administrators*: Represent schools' principals, vice-principals and academic directors or supervisors in schools.
- *ISTE*: International Society of Technology in Education.
- *MOE*: Ministry of Education in the United Arab Emirates.
- *ADEC*: Abu Dhabi Educational Council that has governed Abu Dhabi Emirate Schools since 2005 (Watt, 2012).
- *SEC*: Sharjah Education Council.
- *KHDA*: Knowledge and Human Development Authority in Dubai.
- *UAE*: United Arab Emirates.

### **Organization of the Study**

This study follows a traditional thesis organization and it was divided into five chapters. The first chapter provided an introduction to technology leadership in Sharjah City Schools, the statement of the problem, the purpose of study, the questions, significance and limitation of the study, and finally the terms and acronyms used in the study.

The second chapter consisted of five sections that provide a review of literature and relevant research associated with the problem addressed in this study. These sections are: (1) Leadership and Technology; (2) Standards; (3) National Educational Technology Standards for Administrators (NETS-A); (4) Educational Technology in United Arab Emirates; and (5) Previous Studies.

The third chapter addressed the research design, population and sample, instrumentation, validity and reliability, data collection procedures, data analysis procedures, ethical considerations, and limitation and delimitation. Chapter four presented the results of the study and raised issues on the most important results.



The last chapter provided interpretation, implications, and recommendations.

## **CHAPTER TWO: LITERATURE REVIEW**

This study had multiple purposes. The first one was to describe the state of technology integration in Sharjah City Government Schools based on a juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions. This technique of study would help in reaching a more trusted image of technology integration at Sharjah schools. The second purpose was to investigate the influence of the principal gender on integrating technology in their schools. The final purpose of this study was to identify the main challenges that faced Sharjah government schools' principals in integrating technology in their schools.

In this chapter, the researcher reviewed the educational literature related to the technology leadership practices of school administrators in their schools. The main purpose of this chapter is to develop and establish a theoretical framework to facilitate conducting of this study. The other purpose is to identify the gap among literature through reviewing existing research studies related to principals' technology leadership to be used later in research methodology and results analysis and interpretations.

This chapter consists of five major sections. The first section explains the definitions of the main concepts related to the leadership and technology, and the importance of technology integration in education. The second section discusses the notion of standards and the importance of standards in educational technology. The third section explains national education technology standards for administrators and their origin and descriptions. The fourth section reviews the reality of educational

technology integration in the United Arab Emirates' Schools, and the initiatives that had been adopted by Ministry of Education and other educational bodies in UAE that are related to technology integration. The fifth section is a review of existing research studies on principals' technology leadership and technology integration.

### **Leadership and Technology**

Literature abounds with several studies and research that documents the growing role of school administrations in the technology integration in education. Numerous recommendations and initiatives had been released during the last twenty years regarding the roles of school administrations to ensure the success of the technology integration process. These initiatives were formalized in the issuing of National Educational Technology Standards for Administrators (NETS-A) in 2001 by the International Society for Technology in Education (ISTE).

Leadership is exercising of influence on others urging them to achieve the objectives of the organization through setting ambitious visions based on defined values and principles (Earley & Weindling , 2004). All of the organization's activities are directed towards achieving those visions (Bolden, Gosling, Marturano, & Denniso, 2003). Kinicki & Williams (2009) identified it as the process, in which the individual exercises an influence on the nature and trends of the team continuously and purposefully. Others defined it from the perspective of power and authority as Burke (2008) who stressed that perspective. Burke identified it as the authority or the power that reflects the ability to make an impact on others to foster new practices and embrace targeted behaviors.

## **Technology**

Technology refers specifically to computer-based technologies and includes personal computers, LCD projectors, Smart Boards, PDAs, laptops, PCs and Tablets (Gray-Brown, 2010). Valdez (2004) defined technology as an ingenious human action that incorporates generating of knowledge and operations to develop systems, which resolve problems and expand human capabilities. Yasin (2009) defined information technology as tools and techniques used by information systems to implement various types of computer activities and its applications and accessories including computer hardware and software, storage technology, and communication technology.

The concept of technology could be assumed by its components, which include hardware, software, databases, communications networks, and human resources equipped with necessary technical knowledge in order to manage the mentioned components and utilize them (Altaai, 2005).

## **Importance of Information Technology**

Information technology is a key driver to develop all fields of sciences, which represents a large bond and support for various sciences and all life activities. It plays a significant role in advancing education and knowledge in a variety of sciences towards new horizons and modern methods in gaining knowledge and utilizing them in different ways and conditions (Hew & Brush, 2007). It is possible now to inquire information in various times and circumstances from various sources. Because of this, knowledge becomes global due to information and communication technology (Lewin, 2000).

Knowledge explosion and communication' means evolution assist in providing tools and methods that save and retrieve information when needed. It also helped to provide the required skills and proficiency in order to perform various administrative operations and tasks and increased the speed of access to information and ease of its sharing, which contributed to reduce expenditures and costs (Lewin, 2000).

The importance of information technology occurred through the characteristics and abilities of its tools in facilitating businesses and work, which is characterized by superior precision in displaying stored outcomes and results in addition to the speed of storing and retrieving data at any time quickly and easily. Technology tools contribute in saving money, time, and effort because of massive data processing and conducting operations on an ongoing basis without interruption or fatigue (Hew & Brush, 2007).

Due to the importance of technology in all fields, it became necessary for educational leaders at all levels to adopt technology in their schools starting by increasing their knowledge with technology and then using its tools to facilitate the accomplishment of the school objectives. Conducting the various school operations by using technology will be reflected positively on its main goal that is centered on student learning and improving their achievement and progress. Technology tools will also contribute to save money and time in implementing the instructional and administrative processes and practices (Fisher & Waller, 2013).

### **Educational Technology**

Educational technology is related to the wide range of computer-related equipment, operating systems, networking, and software tools that provide the

infrastructure, where the instructional and school administration operations are working (Hew & Brush, 2007). It refers to technology tools that are used to improve instruction and curriculum execution processes, which may involve computers, digital projection systems, interactive boards, handhelds, software applications, social interactive networks, mobile applications, and automatic response systems. These technological tools help educators to expose students' minds to technology, using various styles of learners, and enhancing the quality of instruction in all grades in the schools (Gray-Brown, 2010).

Educational technology has several impacts on the learning process that can touch the needs of all students' levels. For example it: (1) provides exciting curriculum based on real-life problems into the classroom, (2) provides scaffolds and instruments to promote learning, (3) provides extra opportunities to students and teachers in order to get effective feedback, revision, and reflection, (4) assists in developing local and global communities that include students, teachers, administrators, parents, and other stakeholders, and (5) increases the opportunities for teacher' continuous learning and sustainable professional development (Saleh, 2011).

### **Technology Integration**

Technology integration is the embedding of technology-based practices and technology resources within the daily work, routines, learning processes, and administration of schools (National Forum on Education Statistics, 2002). These practices include cooperative tasks and communication, research using technology - such as the Internet, and electronic communications -such as e-mail and social networks, as well as other various methods. Technology resources involve personal

computers and handhelds, softwares, applications, inter- and intra-communication systems and other infrastructure tools (Gray-Brown, 2010).

### **Technology leadership**

Technology leadership notion refers to school leaders' technological skills, roles, and behaviors that are necessary for leading the integration of technology in their school. It is a combination of general techniques and strategies with some specifications including the use of new knowledge, skills and understanding of how technology can improve instructional practices and the administrative processes (Staples, Pugach, & Himes, 2005).

A strong and effective educational leadership is necessary to the successful initiatives based on technology. To implement information and communication technology in schools properly, all educational leaders at all levels should possess a clear understanding and enough knowledge to the uses of technology from the perspective of all stakeholders in the school (Eren , Kurt, & Askim, 2011).

Using technology in an appropriate manner would help the increase of learning opportunities and advance the quality of teaching through using developed methods and means, which contribute to improve learning outcomes, and developing and reforming the educational management systems. Technology leadership includes a set of different decisions, roles, and actions that could be considered as its characteristics. Their outcomes could be measured in terms of extent of the integration of technology in education (Anderson & Dexter, 2005).

Anderson and Dexter as mentioned in Duncan (2012) claimed that school technology leadership is the sum of nine components, which are: 1) Technology committee; 2) School technology budget; 3) District support costs; 4) Principal

email; 5) Principal days (on technology); 6) Staff development policy; 7) Grants; 8) Intellectual property policy; and 9) Other policies. These components have potential to facilitate information technology embedding in the school leadership practices.

The previous studies indicated that technology leadership might have significant effect on the quality of learning environment supported by technology. Technology leadership is probably influenced largely by background factors, such as, the school type (public or private), size of the school and by infrastructural factors such as the facilities and the amount of funds that are spent on technology (Anderson & Dexter, 2005).

Anderson and Dexter (2005) suggested a model for the role and importance of leadership compared to technology infrastructure and other characteristics of schools. The model proposed a leadership as a mediation function between infrastructure and technology outcomes, specifically that infrastructure has little impact on technology outcomes without the intervening components of technology leadership. Technology outcomes involve: 1) Net Use for e-mail and Web; 2) Technology Integration; and 3) Student Tool Use.

Many countries invest extensively in the field of information and communication technology to promote education. However, the data that support the perceived benefits of using technology is still limited, and the actual evidence of their effect are controversial. These results highlighted various knowledge gaps and a need for international compatible standards, methodologies, and indices that provide a better scale for the real benefits as a result of information and communication technology (Rivard, 2010).

In the midst of this development, and the accelerated change it was necessary for any change movement to be structured and built on a realistic and objective diagnosis in order to stand on its strengths and shortcomings, therefore, searching for remedial solutions to overcome the shortcomings and provide improvements to keep pace with the desired ambitions (Ali, 2013).

The researcher suggests that it is necessary to adopt international standards to regulate the use of technology in education by all stakeholders in the school. Several international educational organizations and institutions provide principles and criteria in accordance with scientific methodologies to keep pace with the scientific and technological evolution (Saleh, 2011).

### **Standards**

Standards-based practices are considered one of the most frequently used issues in educational systems. They are considered key elements in developing all components and practices of the educational system in many countries of the world, especially the developed ones (Assiri, Almohaya, & Algaisi, 2009). Moreover, these practices are common in non-educational areas such as industry, technology, and health and agriculture sciences (Abo Jaser, 2012). Standards work to establish stringent controls range from construction to nanotechnology and plenty of industries to ensure the protection and improvement of people's lifestyles. The main goal of having standards is to improve the living standards of people and to increase the efficiency of their learning and achievement (Abo Jaser, 2012).



## **Definition of Standards**

Standards are agreed methods in implementing anything. It may be manufacturing a product, administering an operation, providing of services or materials. Standards include a wide range of activities that are carried out by organizations and used by customers. Standards result from the knowledge and wisdom of experts, harvested in a certain subject. They know the needs of their organization in a rigorous and comprehensive way. That harvest is considered as a road map in accomplishing the desired (Abo Jaser, 2012; Garland & Tadeja, 2013).

The core of a standard is to provide a reliable floor for people to share the same expectations about a product or service. This assists in facilitating trade, providing a framework for achieving economies, efficiencies, and interoperability, enhancing consumer protection and confidence (Garland & Tadeja, 2013).

## **Standards in Education**

The concept of standards for developing education received considerable attention during the last two decades in terms of studies, practices, and attitudes, as well as policymakers. Numerous studies that were released pointed out the positive impact of adoption of an educational system for standards in all its components starting from educational policies, accounting systems, curricula, calendar, methods of teaching, school administration, learning environment, and ending with using technology in education. Development movement and research studies led to creating the standards-based education system (Battle & Smith, 2004; Garland & Tadeja, 2013).

Standards in education indicate to teaching and evaluation systems, scores system, and academic reporting system that are based on students understanding and

perfecting the knowledge and skills that they are expected to learn through their learning progress. Standards in education are written descriptors about what learners are expected to be knowledgeable about and capable to perform in a certain stage of their learning (Abo Jaser, 2012). On the other hand, Saleh (2011) defined standards as agreed guidelines designed by educational experts and organizations that reflect the qualitative level that should be achieved by all components of educational systems starting from students, teachers, administration, curriculum, resources, teaching and learning methods, assessment, and buildings and equipment.

### **The Importance of Standards in Education**

Standards are considered as an entrance for measuring the quality in a particular cognitive or skill field through: 1) quality of what learners are expected to know, 2) quality of what they can do in this field, 3) quality of program that gives them the opportunity to learn in this field, 4) quality of instruction of this field, 5) quality of supporting system for teachers and programs, and 6) quality of evaluation practices and policies (Saleh, 2011).

Standards are considered a basis for accountability, which is an important starting point for educational reform. Therefore, schools will transform to learning-centered performance through using methods, procedures, and tests based on performance, which could enhance the confidence of communities in education. Standards provide opportunities for coherence, consistency, and cooperation to improve learning in all branches of knowledge, and provide a framework to link knowledge with its use (Battle & Smith, 2004).

## **Technology Standards**

Mastering of school' stakeholders to achieve a particular set of pre-defined professional standards measures the effectiveness of schools' success. These standards are considered as a reference for evaluating the effectiveness of faculty members and administrators through comparing their own performance to others for more self-assessment (Wildy, Pepper, & Guanzhong, 2010). The purpose of professional standards in education is to enhance professional practice and productivity. Countries and organizations link staff certification, promotion, and incentives to a given set of pre-defined professional standards (Saleh, 2011).

Several countries and organizations developed and adopted standards for using technology in education. Some standards are designed to be used for the national, regional, or international level. On the other hand, some standards are written clearly and separately, while others are stated implicitly within comprehensive educational or leadership standards. The ISTE in the USA sets technology standards that are considered the most used and adopted standards worldwide, and there is much research conducted based on these standards. The United Nation Educational, Scientific, and Cultural Organization (UNESCO) had developed standards for information and communication technology in education, but these standards focus on teachers more than administrators (Saleh, 2011).

In the Arab World, there are no clearly and separately stated standards for integrating technology, based on the knowledge of the researcher, while the technology standards are stated implicitly on other educational standards. For example, ADEC developed the professional standards for school principals, which focus in some places on adopting technology (ADEC, 2012). The first ADEC

standard for school principals is "Leading Strategically," which emphasizes on the role of school principals to:

*a) Use of principals for technology in a variety of ways. b) Incorporate new technology in teaching and learning. c) Encourage the use of technology inside the classroom to enhance the learning process. d) Provide modern technology equipment in the school, e) Model the use of technology. f) Provide adequate services to maintain technology in the school, and j) Encourage teacher use of technology in classroom. (ADEC, 2012, p. 5).*

### **National Educational Technology Standards for Administrators (NETS-A)**

The pressing need and rising demands for measuring and quantifying the learning process created new pressures on schools' administrators to use technology in their managerial work as well as the educational process. There is an increasing support for principals to integrate technology in their schools' processes, and such support is based on research for the developing of their technology skills and competences (Anderson & Dexter, 2005; Duncan, 2012; Ertmer, Bai, Dong, Khalil, Park, & Wang, 2002; Gray & Lewis, 2009; Saleh, 2011).

Billions of dollars were spent on educational technology integration in schools around the world. Schools administrators consider that these huge investments enhance the effectiveness of schools and support improvement efforts and practices. However, it is necessary to provide procedures and actions for school administrators to implement them in an optimum way to get the desired goal of these efforts (Anderson & Dexter, 2005).

The NETS-A specified statements about what school administrators should have of experience and competences for technology leadership in their schools (Richardson, Bathon Flora, and Lewis, 2012). Watts (2009) defined NETS-A as

particular guidelines utilized to assist principals to increase technology leadership effectiveness in their schools, proposed by the ISTE in 2002. ISTE (2002) explained that NETS-A standards are indicators of effective technology leadership (Alkrdem, 2014).

Anderson and Dexter (2005) found in their study that there were no significant differences based on gender of principals in integrating technology. They found that overall school leadership effectiveness was more significant than infrastructure indicators in expecting technology dissemination in schools. Technology leadership has a vital role in technology integration in education more than other technology standards in NETS-A (Garland & Tadeja, 2013).

### **The Emergence of NETS-A**

In 1988, the efforts of 10 educational organizations -specialized standard setting for administrators - had joined to establish the National Policy Board for Educational Administrators (NPBEA). In 1994, the Board had developed the Interstate School Leaders Licensure Consortium (ISLLC) as professional standards for administrators, formally adopted them in 1996, and sent them to the Council for Chief State School Officers (CCSSO) to issuance and publishing (Hancock & Fulwiler, 2007).

Coinciding with that, the Educational Leadership Constituent Council (ELCC) issued guidelines for educational administrators known as ELCC guidelines. However, they were not adopted largely, as ISLLC standards that were adopted in United States. Their adoption was limited only by the universities for their appropriateness for administrator's professional preparation programs. After a while, NPBEA merged the ISLCC standards and ELCC guidelines with each other and

called them ELCC Standards. In addition, it adopted their updating and developing over the time (Hancock & Fulwiler, 2007).

However, ELCC/ISLCC standards did not provide sufficient attention to technology standards, despite the beginning of the widespread usage and implementation of technology and its tools remarkably and increasingly. Therefore, it was a pressing need for standards for educational administrators concerned with the technology and focus on the implementation and adoption requirements (Richardson, Bathon, Flora, & Lewis, 2012).

Consequently, the NPBEA contacted ISTE to set standards for technology. ISTE led a group of stakeholders who had reached an agreement on the idea that administrators have to refer to necessary knowledge and particular skills and important practices to initiate the support for the usage of technology in schools in an appropriate and effective manner (Richardson, Bathon, Flora, & Lewis, 2012; Schrum, Galizio, & Ledesma, 201).

In 2001, those collaborative efforts with stakeholders, such as, National Association of Elementary School Principals (NAESP); National School Board Association (NSBA); the National Association of Secondary School Principals (NASSP); State Departments of Education, and universities faculty were yielded in designing a group of standards. These Standards include visionary leadership, learning and teaching, professional practice, support and improvement, assessment and evaluation, and promoting ethical and social use. These standards were known as the National Education Technology Standards for Administrators (NETS-A) of ISTE. ISTE also had developed technology standards for teachers and students and even coaches called NETS-T, NETS-S, and NETS-C corespondingly (Alkrdem,

2014; Hancock & Fulwiler, 2007; ISTE, 2009; Richardson, Bathon, Flora, & Lewis, 2012).

In 2009, ISTE refreshed NETS standards to focus more on the digital community, and digital citizenship, innovation and creativity and merging technology in a social framework (Garland & Tadeja, 2013; ISTE, 2009; Richardson, Bathon, Flora, & Lewis, 2012; Schrum, Galizio, & Ledesma, 2011). The Updated NETS-A consist of five main standards which are considered as important skills and essential practices for administrators to assist them in leading technology and integrating it in their schools in a practical and effective manner (Hancock & Fulwiler, 2007; ISTE, 2009). They include:

1. Visionary leadership: Educational administrators work as technology leaders through the inspiration and driving the process of designing of a shared vision for all, who are concerned in the educational system in order to achieve the comprehensive incorporation of technology. This is to enhance and support the intended transformation through embracing the environment, the atmosphere, and the culture conducive to the change (ISTE, 2009; Richardson, Bathon, Flora, & Lewis, 2012; Rivard, 2010).
2. Digital-age learning culture: Technology leaders create and embrace a sustainable learning culture for the digital age, which provides a convenient and rigorous education that engages all learners (Garland & Tadeja, 2013; ISTE, 2009).
3. Excellence in professional practice: Technology leaders foster environments of professional learning, practices, and creativity that enhance learning by providing the learners with digital educational resources and updated and suitable technology tools (Garland & Tadeja, 2013; ISTE, 2009; Rivard, 2010).

4. Systemic improvement: Technology leaders adopt in their management sustainable improvements of the educational organization through the effective use of technology resources, tools, and information (ISTE, 2009; Rivard, 2010).
5. Digital citizenship: Technology leaders are role models in understanding and facilitating the accommodating of the ethical, social, and legal issues related to the digital culture and to its evolution (ISTE, 2009; Richardson, Bathon, Flora, & Lewis, 2012; Rivard, 2010).

ISTE worked to develop key performance indicators for all standards (see Appendix A), which offer more details and clarification for the administrators during the embedding of technology (ISTE, 2002). However, those indicators are not detailed adequately and the door is left open to scholars and researchers to add extra details, evidences, and clarifications to assist administrators for understanding of NETS-A (Richardson, Bathon, Flora, & Lewis, 2012).

The NETS project designed the education technology standards to determine the fundamental educational technology skills, including education technology leadership skills. The NETS project also produced information to support the evaluation of standard' skill sets achievement . The NETS project published assessments in the form of rubrics. These rubrics assess the different NETS standards across a continuous series of performance. This approach proposes that efficiency in leading technology exists across a range of “exist/not exist” criteria (ISTE, 2009).

### **Leadership and vision**

Effective technology leadership demands the principals to be knowledgeable with the concept, nature, and challenges of technology and being able to develop and define a vision for its embedding in schools (Watts, 2009). Standard I states that



educational administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization (ISTE 2002).

This standard focuses on how technology leaders need to articulate a school-wide shared vision for embedding technology and ensure that the coordination, resources and atmosphere are all in place (ISTE, 2002; Nordin, Yusof, & Jusoff, 2010). Others highlighted the significance of heavily involving the stakeholders in developing the technology vision and plan in order to strengthen their commitment and obtain their continuous support (Brooks-Young, 2013; Watts, 2009). Lecklider, Clausen, and Britten's (2009) study illustrated that there is a remarkable increase over time in involving all of those who related to educational process in planning and vision development.

The effective embedding of technology in schools requires engagement of all stakeholders in the school in a discussion about how to best integrate technology (Duncan, 2011). Brooks-Young (2013) emphasized the need to review strategic plans of the school and district instructional plans to be a springboard to build and implement a long-term plan and dynamic plan for integration of technology in education based on the vision of technology. Rivard (2010) conducted a study to analyze to what extent Michigan Elementary Principals employ behaviors that support their role as a technology instructional leader, using the framework of NETS-A. He found that the shared vision for technology integration must be consistent with the school district vision and the overall vision of the school, and moreover, technology plans should be smoothly compatible with the overall development plan of the school.

Technology leaders work closely with curriculum and faculty for needs analysis and preparing plans in a strategic manner. Approximately all visionary administrators (93%) agreed that the integration of technology in education will improve student achievement (Project Tomorrow, 2007). Schrum, Galizio, & Ledesma (2011) emphasized the importance of building of a technology vision, along with deployment, support, and communication of that vision in order to develop a plan for implementing technology in schools. Nordin , Yusof, & Jusoff's, (2010) survey on Administrators as Technology Leaders was given to 63 administrators of Secondary Schools in Negeri Sembilan. Their results emphasized the importance of technology vision and plan and the role of leadership in integrating technology in their schools. Kozloski (2006) conducted a study on K-12 public school principals in the southeast region of Pennsylvania to explore and describe the connection between the current state of a school's technology use and a principal's methods and strategies for leadership in technology integration. He found that most effective technology plan components are: the vision/mission statement; demographic review of teachers, students, and community; and formation and operation of a viable technology committee with diverse membership.

The principals who have an ambitious and powerful vision for technology integration have considerable potential and capabilities to strengthen and increase the integration of technology among faculty (Fisher & Waller, 2013). Schools principals could instill a common technology vision with faculty through engaging them in building and formulation of that vision, building and follow-up routinely of official long-term plans to realize this vision, promoting and disseminating the culture of innovation, promoting taking risk, and strengthen research-based instructional practices (Duncan, 2011; ISTE, 2009).

Standard (I) entrenches the notions of the Transformational Leadership Theory. Transformational leaders work to inculcate senses of belonging to organization, confidence, admiration, and respect among their subordinates (Hancock & Fulwiler, 2007). Transformational leaders work to engage all school people in the process of technology vision building and development. This will strengthen their commitment to support the implementation of the school's technology plan. However of the vision should be produced from involving teachers as a group, transformational leaders must advocate and communicate that vision as one of their responsibilities to facilitate its realization (Watts, 2009).

### **Digital-Age Learning Culture**

Educational leaders are supposed to be familiar with all instructional operations in the classroom because they are considered as instructional leaders and they are expected to understand how the educational technology supports all students' learning needs and teachers' teaching needs. Educational leaders integrate technology in instruction to advance learning and teaching in their schools (Davies, 2010). School principals work on establishing and fostering an effective learning culture and maintaining it, they provide interesting, serious, and attractive instruction taking into consideration the needs of all students (ISTE, 2009). The responsibilities of the instructional leaders involve communicating and disseminating goals, providing feedback, providing proper professional development for faculty. Despite that the instructional leadership focus on having an understanding for innovation to be accepted in faculty culture, technology integration in teaching forms a challenge for leaders (Alig-Mielcarek and Hoy, 2004).

Afshari, Bakar, Luan, Samah, and Fooi (2009) conducted a survey for 30 Iranian school principals to explore their technology competencies, and the results showed that these principals possessed moderate competencies related to technology. They focused on the importance of providing the Iranian classrooms with more learning technology tools, resources, and equipments.

Brooks-Young (2013) mentioned that one of the school principals' role in promoting the learning culture in the digital age is to assure the innovation in instruction process and improve learning of the digital age continuously. The principals shall be models in the frequent and effective use of technology for learning purposes and strengthen that among faculty. They have to work on providing a learning environment centered on the student, equipped with all technical and educational sources to fit individual and diversity needs for all learners to ensure effective practice in learning by technology and integrate it in curriculum (ISTE, 2009). Technology leaders who have the understanding for instructional applications of technology could be capable to shift the learning community toward adapting of curriculum with specific uses of technology (Watts, 2009).

Stuart, Mills, and Remus (2009) held a questionnaire for school principals in New Zealand, and they concluded that the principals possessed a high technology competency. They were capable to assure effective technology practices for instructional purposes in their schools through being models in using technology. Rivard (2010) study found that Michigan elementary principals identified the significance of fostering effective practices in technology integration so that learners could learn to use higher thinking and problem-solving skills that might be used in a global learning environment. The embedding of technology can strengthen 21st century skills and provide effective resources for learning. However, the value of

technology in the learning depends on their effective integration to foster instruction (Fisher and Waller, 2013).

### **Excellence in Professional Practice**

Educational administrators embrace a professional learning environment that enables educators to improve learning of the learners, through the integration of technology and contemporary digital resources in instruction (ISTE, 2009).

The school principals have to allocate time and resources to ensure continuous professional growth in integrating technology and also act to facilitate the participation in learning communities that motivate, establish, and strengthen utilization of technology by administrators, faculty, and all school staff (Garland & Tadeja, 2013). Principals must always formulate and strengthen effective communication and cooperation among stakeholders in using tools of the digital age. They have to stay updated with educational research and emerging trends regarding the effective utilization of technology and promoting the evaluation of new technologies on the basis of their capacity to improve student learning (ISTE, 2009).

There are sets of skills for technology leaders that emphasize that principals must learn how to run technology tools and take advantage of them as much as possible in the performance of their tasks like communicating with others. They should verify that all people in the school have learning opportunities, such as professional development and provision of release time opportunities (Anderson & Dexter, 2005). Indeed, the principals have to be conversant with uses of technology and the methods of its integration. To accomplish that, they should be ready to check honestly their expectations for themselves and their staff. Then, they need to

establish a precise image for how technology could enhance their duties and work environment (Brooks-Young,2002).

Technology leaders could be productive as they present a model to motivate others to perform technology-related tasks. The tasks to be performed in Standard IV are: (a) formulating obvious expectations regarding means of communication for both staff and community, (b) understanding the different technology forms of communication, (c) offering incentives for faculty to use technology-based communication, and (d) assessing the impact of communication on the site to perform deliberate and effective technology use (Brooks-Young, 2002). Brooks-Young (2002) also mentioned in her book that schools' leaders should have the ability to deal with some actual school problems that should be solved by using technology, which involve correspondence and communication, using of word processing applications, desktop publishing, dealing with spreadsheets, data-based programs; and the use of applications that are based on web.

### **Systemic Improvement**

This standard emphasizes the importance of the educational leader's role to provide effective leadership that keeps pace with the digital age in order to continuously improve their schools through the effective use and embedding of technology resources (Richardson, Bathon, Flora, & Lewis, 2012). To achieve that, there is a need for purposeful leading for change to achieve greater learning outcomes through appropriate and effective integration of technology and its multimedia-rich resources. Moreover, it has to be a collaborative for designing measures, gathering and analysis of data, and then sharing and interpreting results in

order to enhance the teachers' instructional performance and maximize levels of student learning (ISTE, 2009).

One action for systematic improvement is hiring highly qualified, skilled employees who creatively use technology in a distinctive way to achieve the operational and educational goals of schools (Richardson, Bathon, Flora, & Lewis, 2012). Technology leaders should work to establish strategic partnerships and maintain them in order to foster the comprehensive improvement (Ritzhaupt, Hohlfeld, Barron, & Kemker, 2008). Establishing an appropriate infrastructure for technology integration is another action for comprehensive improvement. This infrastructure should include integrated systems to support and facilitate all administrative processes and enhance teaching and learning operations (Watts, 2009). They have to establish a system to maintain that infrastructure to assure its sustainability (ISTE, 2009).

Moreover, schools' principals have to allocate human and financial resources to assure technology integration and maintain its sustainability. They have to act on establishing policies for purchasing recent and updated devices and software as well as to maintaining, upgrading, and/or replacing technology tools on an ongoing basis (Brooks-Young, 2002).

### **Digital Citizenship**

Educational technology leaders should assert and facilitate an understanding for legal, social, and ethical issues, and all responsibilities related to the advanced digital culture among all stakeholders in the schools, which includes teachers, administrators, students, parents, and others (ISTE, 2009; Watts, 2009).

To accomplish that, technology leaders must ensure the provision of equal opportunities for digital tools and resources that fit needs of all students (Garland, 2009). They have to prepare binding policies for the safe, legal, and moral use of information and digital technology, and in the same time, they have to work to consolidate them among all stakeholders (Brooks-Young, 2002) and strengthen the accountable social interaction associated to information technology establish a shared cultural understanding and participate in global issues concerning to technology and communication. They have to be a role model in applying all of the actions above to motivate other people in the schools in order to seek their commitement (Garland & Tadeja, 2013).

### **Educational Technology in the UAE Context**

The UAE established Public schools across the country and they are totally financed by the government to cover their needs and requirements. The curriculum was created to suit with the development goals and values of the UAE. Public schools rely on Arabic as a language of instruction and English is the second language of instruction, which is emphasized highly. There are also numerous private schools that adopt various international curricula, including the MoE Curriculum. Public schools are available for free to all local citizens (Nationals), while the private school fees are varied. Consistent with the UAE Vision 2021, the education is the most important priority for the government, and vigorous efforts are being made for the development of human capital to be an essential brick for creating a knowledge-based economy. The emphasis on education is demonstrated by allocating 21% of the 2014 federal budget for education (UAEinteract, 2014).



The MoE developed the 2020 education strategy, which consists of a series of ambitious five-year plans intended to achieve a significant qualitative improvement in the educational system. Therefore, the MoE has adopted advanced techniques in accordance with the international best practices, and improved students' innovative skills and developed their capacities for self-learning. The reform efforts focus on best preparation, more accountability, and high criteria. Smart learning programs and the revision of school curricula, including mathematics and science instruction through English language, are all part of this strategy (UAEinteract, 2014).

An integrated platform for e-learning has been established in order to reform the learning environment in public schools into new shape, as evidenced by the Mohammed Bin Rashid Program for Smart Learning. This project is considered as a key part of the government's strategy. The Mohammed Bin Rashid Program for Smart Learning started in 2012, and it is executed by the MoE and the Telecommunications Regulatory Authority, which is overseen by Office of the Prime Minister. The program is being implemented in four phases over five years, including all public schools. The purpose is to equip all students with electronic tablets by 2017. The Ministry in collaboration with Etisalat, prepared about 400 campuses with the latest 4G networks, electronic boards smart tablet. The MoE provides electronic contents, including textbooks on Apple IOS and Android platforms. Teachers will be subject to specialized training in consistence to the development of new curriculum (UAEinteract, 2014).

With the relevance to the e-content, the MoE in collaboration with Etisalat and Google company have developed a tutorial channel on Youtube called Duroosi which targets certain grades and students and covers various subject matters (UAEinteract, 2014).

The educational councils in each emirate work to implement the government policy, where the overall strategy is determined by the MoE. Abu Dhabi Education Council (ADEC) is working on improving education by introducing a New School Model project in the Emirate of Abu Dhabi. Knowledge and the Human Development Authority (KHDA) works to reform education in Dubai, while Sharjah Education Council develops the education system in that emirate (UAEinteract, 2014; Watt, 2012).

Sharjah Education Council lunched in 2006 is responsible for identifying the educational plan for Sharjah emirate within the framework of general instruction policy for UAE and in coordination with the relevant federal authorities for this purpose (Sharjah Education Council, 2014) with an integrated electronic platform launched in 2014 to be as a destination for communicating with the field of education, and a host system for other programs that make users updated with the developments and event of the Council and all other educational services (Hamman, 2014). Education in Sharjah fully follows the Ministry reform policies and regulation and adopts them in all schools. which is different than Abu Dhabi and Dubai Councils, where they have their policies and regulations to develop the education in their emirates.

98% of the UAE schools have laboratories for computers. where 100% of public schools have labs for computers, while 96% of private schools have labs for computers. All UAE schools have different forms of telecommunication infrastructure and around 93% of schools have some internet connection. 95% of UAE teachers had undergone different forms of professional development in ICT. Some of them went through training programs during their job and some through previous employment training programs or other out-service courses (Watt, 2012).

The MoE and the educational councils give considerable importance to the technology issue and its integration in the educational process, through establishing contemporary infrastructures that connected all government schools with special servers and provided them with high-speed internet lines, as well as, providing them with latest technological equipment. Their keenness in technology appeared through a variety of projects, initiatives, and various programs to support technology integration in its schools. In pursuit of strengthening the participation of parents in student learning the MoE launched an intelligent student information system (I-SIS) to enable parents access to information relating to attendance and absenteeism, and students' scores, special education requirements, school fees, student assessment record, and other services (Watt, 2012).

Moreover, in 2011 ADEC launched a range of digital electronic learning tools within the initiative “Electronic Classroom” to support curricula of the new school model. This initiative served to make the student the center of the learning process, and helped him/her in developing his/ her innovative thinking skills. They have established digital learning centers in all affiliated schools to support the effective use of digital learning tools. In addition, MoE and ADEC supplied students with digital tablets to be used in the learning process within and beyond the school as well as providing 50,000 digital sources for teachers of kindergarten to grade five (Bayoumi, 2013-b).

In 2013, the MoE and ADEC introduced a section for shifting into e-learning in order to strategize the transition from a conventional learning system to smart digital learning, and to rehabilitate students, their parents, and faculty on the new system practically (Bayoumi, 2013-a).

After reviewing UAE literature, the researcher found that the role of school principals in technology integration in their schools was addressed in some publications that conform with some performance indicators of national educational technology standards for Administrators (NETS-A). The addressing was implicit in some ADEC publications and releases and it was not under particular and independent title for technology.

In 2008 the Ministry of Education adopted new standards for promoting vice principals for school principal positions. Similar to all centralized education systems, school principals in the UAE are selected by the MoE, and they focus on candidates who have an International Computer Driving License (ICDL) (Al-Taneiji, 2012).

ADEC identified five areas for professional standards for school principals in the Emirate of Abu Dhabi that include the strategic leadership, leadership of teaching and learning, leadership of organization, leadership of individuals, and community leadership. The strategic leadership standard emphasized the necessity of planning for optimal use of technology means as learning tools, in addition to the need to strive towards providing a learning environment rich with technologies that contain a set of goals by using technology as well as to provide opportunities for staff to use recent technology tools. The standard urges principals to use technology in diverse ways as sorts of communication strategies inside and outside the institution. It is also stipulated the need to integrate new technologies in the educational process as well as to provide the school with recent equipment and update them continuously (ADEC, 2012).

In addition to that, in 2012/2013 ADEC issued a manual for the public schools policies to provide Emirate of Abu Dhabi Schools with a general framework

of policies associated with topics affecting its schools. Among those policies set forth in the manual, the e-Learning Policy aims to develop sound rules for using information technology in supporting the learning process in public schools (ADEC, 2013).

The e-Learning policy states that the role of school principal are: (1) ensuring the availability of technology resources and distribution of them properly to all school faculties in order to serve and support the educational process and programs, (2) supporting and providing professional development programs and activities within the school to ensure proper use of technology resources in learning process programs (ADEC, 2013).

From the above it is noted that the educational system in the UAE is a centralized system, where initiatives, programs and projects comes by the MoE not by schools. MoE and ADEC also impose professional standards and educational policies to frame schools' work and ask schools to comply to these standards and policies through conducting programmed and periodical inspections.

Based on the researcher's knowledge, there were no written and clear standards particular for schools' principals to integrate technology in schools similar to NETS-A. The researcher could not find any research-based initiatives or projects suggested by school principals for integrating technology in their schools. However, it showed that part of the performance indicators of leadership technology standards (NETS-A) are embedded in some publications of ADEC and MoE, such as professional standards for school principals and the two surveys that were conducted by the ADEC to determine the strengths and weakness of the government schools from the perspective of school principals (ADEC, 2012).

## Previous Studies

Fisher & Waller (2013) conducted a quantitative research on 328 principals and 303,950 teachers about technology leadership and technology integration in Texas K-12 schools. The purpose of their study was to examine the differences between the perceptions of principals and teachers about the abilities of teachers in integrating technology effectively in classrooms, in addition to identify the relationship between principals' instructional-technology leadership and the effective technology integration in their instruction. The results showed that there was a difference between principals' and teachers' perceptions about teachers' abilities to use technology and their access to professional development related to technology. Moreover, there were significant positive correlations between principals' proficiencies related to technology leadership and teachers' abilities to integrate technology and their access to professional development related to technology.

Richardson, Bathon, Flora, & Lewis, (2012) reviewed the literature of school technology leadership in terms of (NETS-A) that was published between the year 1997-2010 using the Education Resource Information Center (ERIC) database. They found that around 68% of the publications were descriptions of projects rather than as descriptions of empirical studies. Only seven studies addressed all five standards of NETS-A. On the other hand, STANDARD IV "Systemic Improvement" and STANDARD V "Digital Citizenship" were least studied in the targeted literature.

Sharija (2012) conducted a case study to explore the leadership strategies of Kuwaiti secondary school principals, who integrated technology in their schools. The finding showed that principals used three main strategies to raise the effectiveness of technology integration in teaching and learning practices of faculty. The strategies included: (1) encouraging faculty to use technology in their instruction; (2) providing

support to fit the needs of faculty in implementing ICT; and (3) providing guidance for faculty about the mechanism and the importance of such behaviors that must be implemented.

Banoglu (2011) used the adapted Principal Technology Leadership Assessment (PTLA) survey on 134 Istanbul schools principals to determine their competency in technology leadership and to identify implications for high competency. The results indicated that school principals' competencies were adequate for technology leadership, but their competency in “leadership & vision” standard was the lowest in comparison with other standards. He found that male school principals are less adequate for “leadership & vision” standard than their female colleagues. However, he determined that schools that had an IT coordinator are more adequate for “learning & teaching” standard of technology leadership.

Duncan's (2011) study's purpose was to describe the engagement and involvement around technology issues by Virginia Public Principals. Duncan implemented the Principals Technology Leadership Assessment (PTLA) instrument based on (NETS-A) (ISTE, 2002) to solicit public schools' principals' opinions. The study findings revealed that in spite of ten years of disseminating NETS-A, Virginia public school administrators hardly met the performance indicators for just five out of the six standards.

Eren, Kurt & Askim's (2011) study's purpose was to measure the technological leadership behaviors of primary school in Turkey regarding the supply and use of educational technologies based on (NETS-A). 870 primary school principals from 16 cities were the study sample size. The researchers used survey research design. The results revealed that the Turkish principals demonstrated a high level of technological leadership behavior in providing and using educational

technologies. Moreover, the results also indicated that there were no significance differences based on principals' gender, study field, level of education, and their experience in leadership. Alkrdem (2013) who conducted a replicated study in Saudi Arabia got the same results.

Richardson & McLeod (2011) in their study interviewed 9 principals to explore the technology leadership in Native American Schools as defined by the NETS-A (2009), and what are challenges that face schools' principals to be effective school technology leaders. They found that principals meet some elements of NETS-A in unique ways and miss various elements of the entire standards. Lack of technology-related professional development, lack of coordinators, poverty, and isolation were major challenges that face Native American principals in leading technology.

Davies (2010) reviewed the literature of technology leadership using Google Scholar that was published between the years of 1998–2008. He addressed and highlighted the research findings based on roles of the technology leaders in the educational change, concepts of technology leadership, and the reasons for embracing digital technology by schools.

Grey-Brown (2010) conducted a descriptive study to examine Miami-Dade County elementary public school principals' self-reported proficiency and perceived importance of technology leadership based on the NETS-A (2002). She used the administration of the Educational Technology for Principals Survey for 103 elementary school principals. The findings indicated that the principals identified standard three as the most proficient while standards four and five were the least proficient areas among the six areas of technology leadership based on the NETS-A. The principal perceived the standard one and six as the highest importance while



standard five was rated as the lowest area that they perceived to be important. She found that there were significant professional development needs for all six areas of the NETS-A.

Nordin, Yusof, & Jusoff (2010) conducted a study to explore the existence of technology leadership in terms of NETS-A (2002), in addition to explore the technology leadership notion under current structure and operations in the educational organization. Results showed that the provision of technology leadership elements in school had a bigger impact on school principals' actions. The adoption of "vision and leadership" and "teaching and learning" standards were in the average level. While the adoption of administrators for the "productivity and professional practices" standard was below the average. They recommended school administrators acquire an inclusive education on the necessary technology knowledge and competencies.

Watts (2009) study aimed to investigate the relationship between technology leadership and school climate to the teachers' integration of technology. Watts collected data through using the NETS-A survey. The results indicated that schools with higher levels of achievement tended to have lower levels of teachers' use of technology. He suggested that administrators have to improve their skills to be more familiar with ISTE standards for technology integration.

Page-Jones (2008) used the Principal Technology Leadership Assessment (PTLA) survey to investigate the technology leadership' behaviors of Florida Public Schools Principals in terms of NETS-A standards and to find the relationship between technology leadership' behaviors of principals and the integration of technology for organizational, instructional, and educational purposes in schools. In

addition, results showed that there was a relationship between technology behavior of educational leaders and the use of technology by faculty members in their schools.

Miller (2007) used a mixed approach design to conduct a study aimed at exploring the role of Virginia Elementary Schools principals as technology leaders and to determine their professional development needs in technology leadership area. The sample identified standards one and six from NETS-A as the most important components of technology leadership. On the other hand, significant professional development needs were found in all standards of NETS-A.

Serhan's (2007) study purposed to investigate the willingness of Emirati School principals to advocate and support the use of technology in their schools. The results showed that principals had positive attitudes toward the integration of technology in instruction, and the schools' leaders were also willing to improve their knowledge, abilities, and competencies to facilitate technology integration in their schools. The study subjects agreed that lack of teachers' experience in using technology was the main challenge in integrating technology.

Kozloski's (2006) study aimed to describe and explore the connection between (1) the current state of technology integration in schools, (2) leaders strategies for technology leadership and (3) technology integration as teaching method, connecting school, and pedagogical change with technology as a reform effort for schools. Results revealed that: principals could facilitate instructional technology-related strategy with limited access to technology resources. integration of technology as an instructional strategy requires more support from principals than other instructional strategy implementations. and principals did not connect technology integration to wider school reform efforts and student attainment. Thus,

integration of technology needs to be learned in the wider context of changing pedagogy.

Akbaba-Altun (2006) conducted a study on computer technologies' integrating complexity into Turkey's schools. He purposed to determine the challenges that face school leaders in embedding computer technologies within a centralized education system. Infrastructure, personnel, curriculum, administration, and supervision were the technology integration main issues. The researcher recommended overcoming these challenges to raise the effectiveness of IT classrooms.

Seay's (2004) study' purpose was to investigate the technology leadership of Texas' Secondary School principals through using NETS-A. The study conducted a comparison for technology leadership practices between principals who engaged in technology leadership academy training with those who did not participate in that training. The results showed that principals' scores were high in all NETS-A standards. The lowest score was for principals' leadership and vision for technology, while, the highest score was in the area of support, maintenance, and operations.

Brockmeier, Sermon, and Hope (2005) examined school leaders' relationship with technology by using survey methodology in Florida. They examined the role of school leaders in participating and facilitating the integration of technology into facultys' instruction and students' learning. The researchers' findings revealed that there was a lack of required competencies and experiences important to lead technology effectively in their schools.

Allen (2003) conducted a study of the professional development needs of 374 Ohio Principals in the area of educational technology as well as the effect of school location and school principal's years of experience on those needs. The findings

indicated that there was a substantial convergence between the roles of school principals and how they performed in reality and NETS-A. No effect of the two variables on the professional development needs required for school administrators.

Christopher (2003) conducted a study aimed to describe the extent of using of IT to support decision-making by 397 Virginia public schools principals and factors affecting the use of technology. The results indicated that the school principals' use of technology in decision-making process was less than 40%, even though the study explained that most of school principals were able to use technology. The results showed that school principals depend on their own abilities and their individual influence more than their reliance on educational technology in decision-making process.

May (2003) conducted a study to find out the effect of using computer technology in performing school principals' tasks. In addition, his study aimed to identify the effect of schools location and school principals' gender, years of experience, and age. The findings showed that using technology had a positive impact on job performance of high school principals. The majority of that impact was centered on the quantitative aspect of performance more than the qualitative aspect, especially in areas of planning, training, administrative work, and decision-making. There was a significant difference related to the principal gender, in favor of female, while there were no differences related to the other variables.

Redish & Cheung Chan's (2003) study's purpose was to measure the prospective administrators' perceptions of their preparation as technology leaders in an educational leadership master's program. The researchers used NETS-A survey that was developed to survey 58 program candidates. The results indicated that the prospective principals' scores of their technology preparation were above the

average. All the standards were scored above average except for standard IV (Support, maintenance, operations, and finance) and standard V (Assessment and evaluation).

Dawood (2001) conducted a study to examine the educational administrators' attitudes toward using computers by Saudi Secondary Public Schools principals. The sample was 59 principals and 122 Vice-principals, and he used the descriptive approach to analyze the data. The results indicated that the attitudes of school principals and their assistants were positive towards using a computer in school administration. The school principals who did not have experience in using a computer were more eager to use it in managing the school more than those who already used a computer. The results also showed that there was no correlation between attitudes of school principals and their assistants with duration of their use of computer or possession of it.

Anderson & Dexter (2000) used the descriptive approach to examine the relationship between school leadership and effective utilization of technology based on three scales, such as the schools demographic factors and if there were any effects on technology leadership. The results indicated that private schools were significantly lower than public schools in technology leadership standards due to the availability of grants for public schools and their principals highly used e-mail. They discovered that there was no effect for the principal's gender on the degree of technology leadership.

### **Summary**

Based on literature review, most of researches about technology standards for administrators in the previous studies were used descriptive research design, such

as (Allen, 2003; Banoglu, 2011; Duncan, 2011; Eren, Kurt & Askim, 2011; Fisher & Waller, 2013; Grey-Brown, 2010; Nordin, Yusof, & Jusoff, 2010; Page-Jones, 2008; Redish & Cheung Chan, 2003; and Seay, 2004).

While some studies used the quantitative approach such as (Al Sharija & Watters, 2012; and Richardson & McLeod, 2011). Miller (2007) used mixed approach design to conduct his study. However, Richardson, Bathon, Flora, & Lewis's (2012) findings indicated that around 68% of the publications about technology standards were descriptive. Thus, for that reason this study adopted the descriptive approach in its methodology to collect and analyze the data.

This study is unique for different reasons. Based on the researcher's knowledge, it is the only study about technology leadership in the UAE. Moreover, it is considered as one of the very few studies that was conducted in the Gulf Arab Region about technology standards where Alkrdem's (2013) study was conducted in year 2013/2014 on Saudi Arabia Public Schools, which is considered as a replicated study for Eren, Kurt & Askim's (2011) study that was conducted in Turkey.

Richardson, Bathon, Flora, & Lewis' (2012) findings showed that just 19% of studies -that were conducted up to year 2010- had studied all NETS-A standards. In addition, standard IV "Systemic Improvement" and Standard V "Digital Citizenship" were least studied in targeted literature. In this study, all standards of NETS-A that were studied included Standard four and five.

To gain deep understanding of integrating technology on the leadership practices within UAE context, this study adopted juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions through surveying both of school' principals and teachers. This technique of study would help in reaching a more trusted image of technology integration at Sharjah

Government Schools. Fisher & Waller (2013) used the same technique in their study that aimed to examine the differences between the perceptions of principals and teachers about principals' instructional-technology leadership and the effective technology integration in their instruction.

Anderson & Dexter (2000) and May (2003) aimed to study the impact of demographic factors such as the effect of schools location, type (public or private), school principals' gender, years of experience, and age. Based on their results, there were no significant differences in all factors except gender and school type (public or private) and there was a disagreement between the two studies about the impact of gender on the integration of technology in education. Thus, this study adopted the gender factor to measure its impact on integrating technology at Sharjah Schools.

The third question of this study addressed the main challenges that faced schools principals in integrating technology, which was similar to Akbaba-Altun's (2006) study that aimed to determine the main issues that face school principals in centralized education system, and both of them used the quantitative research method to collect data.

### **CHAPTER THREE: METHODOLOGY**

This chapter provides an overview of the methodology including the research design, population and sample, instrumentation, data collection procedures, and data analysis. This study had multiple purposes. The first one was to describe the state of technology integration in Sharjah City Government Schools based on a juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions. This technique of study would help in reaching a more trusted image of technology integration at Sharjah Schools. The second purpose was to investigate the influence of the principal gender on integrating technology in their schools. The final purpose of this study was to identify the main challenges that faced Sharjah Government Schools' Principals in integrating technology in their schools.



## **Research Design**

This research is a descriptive quantitative research design. The descriptive approach is defined as a form of systematic scientific analysis and interpretation to describe a phenomenon or a specific problem, which is represented quantitatively by collecting data and information about a phenomenon or problem in order to classify, analyze, and subject it to in-depth study (Salaria, 2012). Quantitative research can be seen as the analysis of collected data numerically to describe, explain, and predict a certain issue or phenomenon (Gay, Mills, & Airasian, 2009). The researcher used the quantitative approach to describe the perspectives of school principals and teachers regarding technology integration in Sharjah City Schools. NETS-A published by ISTE in 2008 were used as reference points for technology integration in light of which the perceptions of principals and teachers were described.

The descriptive quantitative research method was used to answer the research questions: 1) how do teachers and principals view the integration of technology in Sharjah Government Schools? 2) Are there any significant differences in technology integration based on the principal gender? and 3) What are the main challenges that face Sharjah School Principals in integrating technology in their schools? These questions were answered by using the means, standard deviations, and frequencies. This is followed by commenting on the most salient results and highlighting important and/or controversial issues in the results.

## **Population of the Study**

The population of this study was comprised of all Government School Principals in Sharjah City Schools in all cycles except kindergarten. The total

number of Sharjah Government Schools is 68, and these are managed by 68 school principals. In addition, the second set of population was government teachers within these schools, which totaled to 2141 teachers. The population was limited to Sharjah City Schools only, and excluding other Sharjah Emirates Schools because the Emirate of Sharjah State was too large to cover given the limited time and resources to conduct this study. 66% of Sharjah City School Principals were females and 34% were males. 67% of the teachers' population was female and 33% were males as shown in table 1.

Table 1: *Population number of principals and teachers by gender*

	Principals		Total	Teachers		Total
	Male	Female		Male	Female	
No	23	45	68	707	1434	2141
%	34	66	100	33	67	100

### Sample of the Study

The study instrument was distributed in 37 schools, which represented 54.4% of Sharjah City Schools. The number of teachers in Sharjah Schools was two thousands one hundred forty one 2141 according to the official data collected from Sharjah Education Office. At schools, the researcher distributed two forms of questionnaires in each school, one to be filled by ten teachers and the other by the school principal himself/herself. Therefore, the sample is considered a convenient sample. Convenient sampling is a non-probability sampling technique where the samples are chosen because they are accessible and proximate to the hand of the researcher. Usually, this kind of technique is used when the population of the study is

large and it is impossible to cover all individuals (Ross, 2005). The number of participant teachers was 344, which represents 16% of teachers in the Sharjah City Schools. According to sample size calculation and based on the population size, this is a representative sample at a confidence level of 95%. Of the principal's sample, around 56.8% was female and 37.8% were males, and 5.4% did not specify their gender.

Table 2: *Distribution of Principals and Teachers According to their Gender on the Study Sample*

	Principals			Total	Teachers			Total
	Male	Female	Unknown		Male	Female	Unknown	
No	14	21	2	37	135	206	3	344
%	37.8	56.8	5.4	100	39.2	59.9	.9	100

### **Instrumentation**

The researcher developed a survey with two versions, one for school principals, and the other for teachers. The two versions measure the performance indicators of NETS-A based on the perceptions of principals and teachers. The researcher relied on two surveys to develop and design the study instrument; The first one is UCEA Center for the Advanced Study of Technology Leadership in Education (CASTLE) survey that is called Principals Technology Leadership Assessment survey (PTLA), which was adopted in several studies such as Watts (2009), Nordin, Yusof, and Jusoff (2010), and Duncan (2011). The second one is the survey that was adopted by Redish and Cheung Chan (2003) study. Those surveys were used as bases of the current research instrument, which was adapted and modified to fit the UAE context, as will be explained in the validity section.

The principals' survey consists of three major sections; the first section asked about the demographic information such as gender, qualification, years of experience, and school information. The second section provided 38 items covering the five parts of NETS-A performance indicators. The items were structured on a 5-point Likert scale that can be answered according to the following scale: 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, and 5 = Always. The third part asked about challenges that face school principals in integrating technology in their schools. This part consists of seven challenges that were drawn from the literature reviewed in chapter 2. The participants were asked to select the most important three challenges and to add any extra challenges if there is any.

The teachers' survey consists of two major sections. The first section asked about the demographic information such as gender, qualification, years of experience, and their schools information. The second section provided 34 items covering the five parts of NETS-A performance indicators. These items were structured on a 5-point Likert scale that can be answered based on the following scale: 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, and 5 = Always. Both copies were translated into Arabic and were revised linguistically by a specialist in Arabic language to be conductible in Sharjah City Schools.

### **Validity**

The first step in confirming the validity of the instrument was building it on literature. The researcher referenced to Brooks-Young's (2002) study and UCEA Center for the Advanced Study of Technology Leadership in Education (CASTLE) survey that was called Principals Technology Leadership Assessment (PTLA) and Redish and Cheung Chan (2003) study in addition to other literature on technology leadership to collect additional information about standards.

The researcher also gathered existing surveys and solicited the advice of the thesis advisor to identify best practices for item development to build the statements of the survey. The thesis advisor reviewed each item to assess general face validity and its alignment with the five standards of NETS-A. Moreover, upon recommendation of the advisor the survey was shared with five professors in the College of Education to review the survey and check its content validity. In turn, they provided valuable remarks that were considered when producing the final version of the principals' survey.

The researcher adapted the principals' survey items to be suitable in their drafting for teachers and implemented the same steps mentioned above to check the validity.

### **Reliability**

Cronbach's alpha is a measurement of a reliability coefficient that is used as a measure of internal consistency or reliability of a psychometric test score for a sample of participants. A pilot study was conducted on thirty-three principals in Al Ain City to test the reliability of the survey of this study. The reliability was tested using Cronbach's alpha, which was calculated for each of the five sub-scales individually and for all survey items together. Tables 3 and 4 summarize the results.

Table 3: *Cronbach Alpha coefficients for principals sample*

<b>Questionnaire section</b>	<b>Number of items</b>	<b>Cronbach's Alpha</b>
First: Visionary Leadership	7	.92
Second: Digital Age Learning Culture	9	.86
Third: Excellence in Professional Practice	8	.84
Fourth: Systemic Improvement	8	.82

Fifth: Digital Citizenship	6	.68
All Items	38	.96

As the table showed, all coefficients for test results are above 0.7 for the sub-sections and the whole questionnaire, which indicates a high reliability except for the fifth scale which was 0.68, but it is still acceptable.

Table 4: *Cronbach Alpha coefficients for teachers sample*

Questionnaire section	Number of items	Cronbach's Alpha
First: Visionary Leadership	5	.94
Second: Digital Age Learning Culture	9	.90
Third: Excellence in Professional Practice	7	.96
Fourth: Systemic Improvement	7	.95
Fifth: Digital Citizenship	6	.95
All Items	34	.98

As the table showed, all coefficients for test results are equal or above .90 for the sub-sections and the whole questionnaire, which indicates a high reliability and consistency among survey items.

### **Data Collection Procedures**

A formal letter was sent from the Dean of the College of Education at the UAE University to Sharjah Education Office Superintendent to facilitate conducting this study on government schools. This letter was circulated to all Sharjah City Government Schools along with the approval letter from the Office. Sharjah Education Office provided the researcher with a list of government schools and the

numbers of teachers and administrators within these schools.

The researcher tried to use a technology tool (surveymonkey.com) to distribute the questionnaires to all schools but Sharjah Education Office advice was to distribute the questionnaires by hand and collect them a faster and more effective way than using email or other technology tools because not all principals and teachers check their emails regularly. Thus, the researcher collected data from 37 out of 68 schools during one week due to the large area of Sharjah City and the long distances between schools. The researcher prepared one envelope for each school that contains one questionnaire for the school principal and 10 questionnaires for teachers.

The administration of each school distributed the questionnaires after the researcher clarified that any staff member in the school can participate. Some school principals had personally supervised the selection of the participating teachers while others delegated this task to other administrators. Two hours were given to complete the questionnaires for each school and the researcher collected the questionnaires the same day himself. The researcher was keen to assure the participants that their identities and the place of their work would be kept confidential and would not be recognizable in any way.

### **Data analysis procedures**

To answer the first research question of this study, descriptive statistics (i.e., means, cumulative means, standard deviations, and frequencies) were calculated for all items in order to analyze the responses for technology leadership standards in the second part of the survey.

Data analyses for the technology leadership standards were performed by using Statistical Package for the Social Sciences (SPSS) version 20.0 for windows.

The interpretations of the mean scores of the technology leadership standards for this research followed the following scales of "Never" = 1 to 1.79, "Rarely" = 1.8 to 2.59, "Occasionally" = 2.6 to 3.39, "Frequently" = 3.4 to 4.19, and "Always" = 4.2 to 5.

In order to answer the second research question, a T-test analysis was performed to determine if there were significant differences in integrating technology standards based on the gender variable. Frequencies were used to categorize principals' responses for the third research question to identify the most important challenges that face Sharjah city government school principals in integrating technology in their schools.

### **Ethical considerations**

Research ethics are identified as standards of behavior that lead the moral choices and the relationship with others. The main objective of ethics through research is making sure that respondents are not subjected to any abuse or harm nor violate their rights (Gay, Mills, & Airasian, 2009). To abide by the research ethics, all participants in this study had been informed of the purposes of the study through stating them in the cover letter attached to the surveys. They also were informed that they have the choice to participate or not in this study and that their participation is voluntary. They were informed that their completion of the survey is considered as their formal consent to participate freely in this study. Moreover, they were informed that they could withdraw from participating in this study at any time with no effect on them in any way. Regarding confidentiality and anonymity, participants were informed that their anonymity was guaranteed and protected. In addition, the cover letter to the survey stated that their responses would be kept confidential and the identifying information will not be revealed. All participants were supplied with the researcher contact information in order to respond their



questions about the surveys or to inquire about the research findings.

### **Delimitation and Limitation**

This study was limited to Sharjah City Schools and the findings may not be relevant to schools in other emirates. The study also was limited to the Sharjah City Government Schools so the findings may not be relevant to the private schools in Sharjah city or other emirates.

Self-administered surveys were used in this study. This may indicate that some participants might not have taken enough time to complete the surveys properly or that their responses did not reflect the actual reality of their schools because the surveys were distributed and collected through school principals. The surveys can be affected also by the biases, feelings, relationship, moods, perceptions, and personal judgments of the participants or by their job satisfaction. However, data were collected from both the principals and teachers, which helped in reaching fairly, acceptable viewpoints about technology integration in schools.

## CHAPTER FOUR: RESULTS OF THE STUDY

This study had multiple purposes. The first one was to describe the status of technology integration in Sharjah schools and the practices of school principals in this regard. This was done through surveying teachers' perspectives. The survey was built on internationally-recognized technology standards. The second purpose was to identify the influence of principal's gender on integrating technology in their schools. The final purpose was to identify main challenges that face Sharjah principals in integrating technology in their schools. This chapter reports on the results of the statistical analyses used to address those purposes. Specifically, this chapter will provide answers to the following research questions:

1. How do teachers and principals view the integration of technology in Sharjah Government Schools?
2. Are there any significant differences in technology integration based on the principal gender?
3. What are the main challenges that face Sharjah School principals in integrating technology in their schools?

### **Technology integration in Sharjah Government Schools**

To answer the first research question, two questionnaires were used with each of them containing five dimensions. Principals answered the first questionnaire while the second was answered by the teachers. Respondents assessed the level of meeting NETS-A on a five point Likert scale where (Never= 1- 1.79), (Rarely = 1.8 - 2.59), (Occasionally = 2.6 - 3.39), (Frequently = 3.4 - 4.19), and (Always= 4.2 - 5).

Tables (5 -9) show means and standard deviations for NETS-A Standards from the perceptions of school principals, while tables (10-14) show means and standard deviations for NETS-A Standards from the perceptions of teachers.

Table 5 shows means and standard deviations of STANDARD I (Visionary Leadership). The cumulative mean of the visionary leadership component was very high ( $M = 4.20$ ) and the standard deviation was ( $SD = .86$ ) and this indicates high agreement on the idea that leaders in Sharjah schools in general had clear visions in leading technology integration in schools. Surprisingly, item number three, “I develop and implement a strategic plan for using technology to achieve the vision of technology integration in my school” has the lowest mean of ( $M = 3.8$ ) and standard deviation of ( $SD = .90$ ). However, this was counterbalanced by responses to item number six, “I use technology to collect and analyze data in order to develop my school improvement plan” which had the highest mean ( $M = 4.48$ ,  $SD = .85$ ). The responses to item six ( $M = 4.48$ ) and item two ( $M = 4.34$ ) show clear contradiction to responses to item three.

The standard deviation for item five “I develop policies and programs that support technology integration practices, particularly research-informed practices” was the highest ( $SD = 1.10$ ), which means that there is a notable variance in the principals adoption of policies and programs that support technology integration, or perhaps they develop policies and programs away from research-informed practices. The interesting matter was that the mean ( $M = 3.94$ ) was low. This contradicted also the responses to items two where the mean ( $M = 4.34$ ) was high. The principals’ responses indicated that they are disseminating the vision of using technology and they explain the expectations from using technology among all stakeholders in their schools. At the same time, they are not always developing and implementing a

strategic plan for using technology to achieve the vision, and they are not always developing policies and programs to support technology integration.

Table 5: *Descriptive Statistics –Principals’ perceptions of the Visionary Leadership*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>3</b>	I develop and implement a strategic plan for using technology to achieve the vision of technology integration in my school.	3.8	.90
<b>5</b>	I develop policies and programs that support technology integration practices, particularly research-informed practices.	3.94	1.10
<b>4</b>	I involve faculty and staff in the planning process for using technology in my school.	4.22	.84
<b>1</b>	My school has a clear vision to achieve the comprehensive integration of technology to support effective professional practice.	4.25	.81
<b>7</b>	I participate in activities that aim to identify best practices in using technology for managing school operations (for example, attending conferences, and meetings at the school district).	4.25	.85
<b>2</b>	I disseminate the vision of using technology and explain the expectations from using technology among all stakeholders in my school.	4.34	.68
<b>6</b>	I use technology to collect and analyze data in order to develop my school improvement plan.	4.48	.85
	Cumulative mean of the visionary leadership	4.20	.86

Table 6 shows the means and standard deviations for principals’ perceptions of STANDARD II (Digital Age Learning Culture). The cumulative mean for this standard was very high ( $M = 4.35$ ) and the standard deviation was ( $SD = .65$ ). Item number eight, “I provide high quality professional development to support the integration of technology to improve student learning” had the lowest mean of ( $M$

=3.88) and standard deviation ( $SD = .90$ ). Item number one, “I reinforce the use of technology to improve teaching” got the highest mean ( $M= 4.77, SD= .49$ ).

There is a big difference between the cumulative mean ( $M=4.35$ ) and the mean of item eight ( $M=3.88$ ). This means that there is a culture for digital age learning in Sharjah schools but there is insufficient high quality professional development to support this culture. The results show that the principals always reinforce the use of technology to improve teaching but they do not provide high quality professional development and not always assess the training needs of teachers for integrating technology.

Table 6: *Descriptive Statistics -Principals’ perceptions of Digital Age Learning culture*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>8</b>	I provide high quality professional development to support the integration of technology to improve student learning.	3.88	.90
<b>7</b>	I assess the training needs of teachers related to the use of technology.	4.08	.71
<b>3</b>	I reward teachers who use technology creatively in their teaching	4.26	.75
<b>5</b>	I provide a learning environment equipped with technological resources to meet the needs of diversified and individualized learning.	4.31	.67
<b>4</b>	I direct teachers to use technology for analyzing and interpreting students' data to improve the teaching practices.	4.35	.64
<b>6</b>	I present a role model to my teachers providing best teaching practices in using technology.	4.37	.54
<b>2</b>	I encourage teachers to use technology frequently and effectively in teaching to improve students' higher thinking and problem-solving skills.	4.51	.61

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>9</b>	I support teachers who wish to attend special events on using technology in teaching (time release, financial support...).	4.60	.55
<b>1</b>	I reinforce the use of technology to improve teaching.	4.77	.49
	Cumulative mean of digital age learning culture	4.35	.65

Table 7 shows means and standard deviations for principals' perceptions of STANDARD III (Excellence in Professional Practice). The cumulative mean for this standard was very high ( $M = 4.34$ ) and standard deviation was ( $SD = .70$ ). Item number seven, "I use the results of technology evaluation for professional development and decision-making" had the lowest means ( $M = 4.19$ ) and standard deviation was ( $SD = .82$ ). Item number eight, "I value the initiatives offered by teachers and staff that use technology" got the highest mean ( $M = 4.65$ ,  $SD = .53$ ). The results show that the principals always value the initiatives offered by teachers who use technology, but ironically, they do not always provide them with necessary professional development.

Table 7: *Descriptive Statistics –Principals' perceptions of Excellence in Professional Practice*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>7</b>	I use the results of technology evaluation for professional development and decision-making.	4.19	.82
<b>1</b>	I present a role model to my staff in using technology in all administrative work.	4.24	.89
<b>4</b>	I keep pace with recent technological products that could be used in education.	4.37	.72
<b>2</b>	I communicate with teachers, administrators, parents, and the community using different tools of technology.	4.40	.83

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>3</b>	I use technology to improve, develop, and support school operations (such as, files archiving, managing budgets, managing students' information, building schedules, etc.)	4.51	.69
<b>6</b>	I participate in professional development activities for improving the use of technology in administration.	4.51	.60
<b>5</b>	I encourage administrators in my school to use technology to improve their productivity	4.54	.50
<b>8</b>	I value the initiatives offered by teachers and staff that use technology.	4.65	.53
	Cumulative mean of excellence in professional practice	4.43	.70

Table 8 shows means and standard deviations for principals' perceptions of STANDARD IV (Systemic Improvement). The cumulative mean of this standard was high ( $M = 4.26$ ) and the standard deviation was ( $SD = .72$ ). Item number two, "I can deal with frequent technical problems when using the computer." has the lowest mean of ( $M = 3.86$ ) and standard deviation was ( $SD = .85$ ). Item number one "I provide adequate support to facilitate the use of technology in various operations (such as monitoring absenteeism, monitoring students' grades...etc..." was with the highest mean ( $M = 4.54$ ,  $SD = .65$ ). The results show that there is a systematic improvement in schools; however, school principals lack the skills in dealing with the frequent technical problems when using computers.

Table 8: *Descriptive Statistics –Principals' perceptions of Systemic Improvement*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>2</b>	I can deal with frequent technical problems when using the computer.	3.86	.85

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>3</b>	I provide adequate budget to facilitate the use of technology tools.	4.19	.78
<b>7</b>	I am committed to upgrade the technology hardware and software to improve the performance of various operations in the school.	4.21	.75
<b>4</b>	I provide specialized staff to facilitate the use of technology in school (such as technical support technician, networks technician, and/or IT coordinator)	4.24	.68
<b>5</b>	There is a clear policy in my school to purchase, maintain, upgrade, and/or replace technology tools on an ongoing basis.	4.29	.77
<b>6</b>	I assess the specifications and costs of the hardware and software before embarking on the process of purchase.	4.36	.68
<b>8</b>	I encourage all teachers and staff to use technology for analyzing data; then interpreting and disseminating the results of school operations.	4.40	.59
<b>1</b>	I provide adequate support to facilitate the use of technology in various operations (such as monitoring absenteeism, monitoring students' grades...etc.)	4.54	.65
	Cumulative mean of systemic improvement	4.26	.72

Table 9 shows means and standard deviations for principals' perceptions of Standard V (Digital Citizenship). The cumulative mean of this standard was high ( $M = 4.30$ ) and the standard deviation was ( $SD = .73$ ). Item number two, "I provide technology resources appropriate to the needs of all students in all grades" has the lowest mean of ( $M = 4.00$ ) and standard deviation was ( $SD = .72$ ). Item number one, "I provide equal opportunities for all students to get access to technology resources" got the highest mean ( $M = 4.36$ ,  $SD = .79$ ).



The cumulative mean showed that principals have positive perceptions and care about digital citizenship. Nevertheless, there was inconsistency with the results of the second item. The question to be raised is: How could the principals care about digital citizenship in their schools while they are not always providing technology resources appropriate to the needs of all students.

Table 9: *Descriptive Statistics –Principals’ perceptions of Digital Citizenship*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>2</b>	I provide technology resources appropriate to the needs of all students in all grades.	4.00	.72
<b>4</b>	I respect the intellectual property rights for all technology products and I advocate this concept among all stakeholders in the school.	4.28	.75
<b>6</b>	I disseminate health–related instructions for using technology in my school (such as proper seating in front of computers, number of hours to use computers, etc.)	4.28	.75
<b>3</b>	There are policies and instructions in my school for the safe, legal, and ethical use of technology resources and tools.	4.30	.62
<b>5</b>	All technology resources in my school are secured and protected when they are used by students.	4.30	.78
<b>1</b>	I provide equal opportunities for all students to get access to technology resources.	4.36	.79
	Cumulative mean of digital citizenship	4.30	.73

Tables from (10-14) show the descriptive statistics for NETS-A Standards from the teachers' perspective.

Table 10 shows means and standard deviations for teachers’ perceptions of the STANDARD I (Visionary Leadership). The cumulative mean of this standard was high but less than 4.00 ( $M = 3.76$ ) and the standard deviation was ( $SD = 1.21$ ). The

cumulative mean score for this standard based on principals' responses was very high 4.20. Item number four, "I participate in the planning process for using technology in my school" has the lowest mean of ( $M = 3.48$ ) and standard deviation was ( $SD = 1.34$ ). This is in stark contrast to principals' responses that they always involve faculty in planning process for using technology. Item number two, "The principal disseminates the vision of using technology and explain the expectations from using technology among all stakeholders in my school" got the highest mean ( $M = 3.95$ ,  $SD = 1.16$ ). This was consistent with principals' argument that they are always disseminating a vision of using technology in their schools. The teachers' cumulative mean ( $M = 3.67$ ) indicates that the schools' principals overestimated themselves or their practices in Standard I. Nevertheless, teachers view that the principals do not always set clear visions for technology integration neither do they implement strategic plans for achieving the technology vision.

Table 10: *Descriptive Statistics –Teachers' perceptions of the Visionary Leadership*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>4</b>	I participate in the planning process for using technology in my school.	3.48	1.34
<b>5</b>	My school has policies and programs that support technology integration practices, particularly research-informed practices.	3.62	1.32
<b>3</b>	The principal develops and implements a strategic plan for using technology to achieve the vision of technology integration in my school.	3.86	1.18
<b>1</b>	My school has a clear vision to achieve the comprehensive integration of technology to support effective professional practice.	3.90	1.16

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>2</b>	The principal disseminates the vision of using technology and explains the expectations from using technology among all stakeholders in my school.	3.95	1.16
	Cumulative mean of the visionary leadership	3.76	1.21

Table 11 shows means and standard deviations for teacher's perceptions of STANDARD II (Digital Age Learning Culture). The cumulative mean score for this standard was the second lowest mean in comparison with other standards ( $M = 3.99$ ) and the standard deviation was ( $SD = 1.17$ ), which was different from principals' mean score ( $M = 4.35$ ). This might mean that teachers and principals viewed the digital age learning culture in schools differently. Item number three, "The principal rewards teachers who use technology creatively in their teaching." has the lowest mean ( $M = 3.56$ ) and standard deviation was ( $SD = .1.28$ ). It is surprising to know that principals believe that they always reward teachers to use technology creatively in their teaching and this was obvious from their responses to this item ( $M = 4.23$ ). Item number one, "The principal reinforces the use of technology to improve teaching" got the highest mean ( $M = 4.30$ ,  $SD = 1.00$ ), but the mean is much less than principals' argument that they always reinforce the use of technology to improve teaching ( $M = 4.77$ ).

Teachers' responses indicated that principals do not always offer time and financial support for teachers who wish to attend special event on using technology ( $M = 3.86$ ), while principals' responses showed that they always do that ( $M = 4.60$ ). Principals and teachers did not agree on item, "The learning environment in my school is equipped with technological resources to meet the needs of diversified and

individualized learning” as the means were ( $M = 4.31$ ,  $M = 3.87$ ) respectively. This is important since it shows the big difference in the perceptions of the study samples.

Teachers' and principals' responses were somewhat close on items one and nine ( $M = 4.30$ ,  $M = 4.7$ ), ( $M = 4.21$ ,  $M = 4.35$ ), while their responses were different in the other items.

Table 11: *Descriptive Statistics –Teachers’ perceptions of Digital Age Learning Culture*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>3</b>	The principal rewards teachers who use technology creatively in their teaching.	3.56	1.28
<b>9</b>	The principal offers time and financial support for teachers who wish to attend special events on using technology in teaching.	3.86	1.12
<b>5</b>	The learning environment in my school is equipped with technological resources to meet the needs of diversified and individualized learning.	3.87	1.98
<b>8</b>	The principal provides high quality professional development to support the integration of technology to improve student learning.	3.90	1.03
<b>6</b>	The principal presents a role model for teachers providing best teaching practices in using technology.	3.99	1.09
<b>4</b>	The principal directs teachers to use technology for analyzing and interpreting students' data to improve the teaching practices.	4.08	1.08
<b>2</b>	The principal encourages teachers to use technology frequently and effectively in teaching to improve students’ higher thinking and problem-solving skills.	4.16	1.04
<b>7</b>	I use technology in all my teaching and non-teaching duties.	4.21	.95
<b>1</b>	The principal reinforces the use of technology to improve teaching.	4.30	1.00
	Cumulative mean of digital age learning culture	3.99	1.17

Table 12 shows the means and standard deviations for teachers' perceptions on STANDARD III (Excellence in Professional Practice). The cumulative mean of this standard was high ( $M = 4.07$ ) and the standard deviation was ( $SD = 1.05$ ). Again, it was lower than principals' cumulative mean for the same standard ( $M = 4.43$ ,  $SD = .492$ ). Item number six, "The principal uses the results of technology evaluation in professional development and decision-making has the lowest means ( $M = 4.01$ ) and standard deviation ( $SD = 1.06$ ). This is similar to principals' score to the same item ( $M = 4.19$ ). Item number three, "The principal uses technology to improve, develop, and support school operations (such as: files archiving, managing budgets, managing students' information, building schedules, etc.)" got the highest mean ( $M = 4.07$ ,  $SD = .95$ ). However, it is still lower than principals' mean score ( $M = 4.51$ ). In general, teachers' mean scores were lower than principals' mean scores on all items of this standard. The other point is that teachers viewed practices in this standards as happening frequently while principals saw them as always happening, except for item number seven, which was in the frequent scale ( $M = 4.19$ ).

Table 12: *Descriptive Statistics –Teachers' perceptions of Excellence in Professional Practice*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>6</b>	The principal uses the results of technology evaluation in professional development and decision-making.	4.01	1.06
<b>4</b>	The principal keeps pace with recent technological products that could be used in education.	4.02	1.04
<b>7</b>	The principal values the initiatives offered by teachers and staff that use technology.	4.03	1.09
<b>1</b>	The principal presents a role model for us in using technology in his administering works.	4.03	1.05

<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>2</b> The principal communicates with teachers, administrators, parents, and the community with using different tools of technology.	4.06	1.08
<b>5</b> The principal encourages staff to use technology to improve their productivity.	4.16	1.06
<b>3</b> The principal uses technology to improve, develop, and support school operations (such as: files archiving, managing budgets, managing students' information, building schedules, etc.)	4.07	.95
Cumulative mean of excellence in professional practice	4.07	1.05

Table 13 shows the means and standard deviations for teachers' perceptions of STANDARD IV (Systemic Improvement). The cumulative mean score of teachers' perceptions was ( $M = 3.8$ ,  $SD = 1.17$ ) for this standard and it was lower than the cumulative mean score of principals ( $M = 4.26$ ). Item number three, "The principal provides adequate budget to facilitate the use of technology tools" has the lowest mean ( $M = 3.69$ ) and standard deviation was ( $SD = 1.20$ ). Teachers' responses indicated that principals frequently provide budget for using technology ( $M = 4.19$ ). Item number one "The principal provides adequate technical support to facilitate the use of technology in various operations (such as monitoring absenteeism, monitoring students' grades...etc.)" got the highest mean ( $M = 4.10$ ,  $SD = 1.05$ ) but again this was lower than principals' mean score ( $M = 4.54$ ).

Teachers' responses to principals' practices in this standard were frequent and they disagreed with principals' responses which were "always" in all items except item number three, "The principal provides adequate budget to facilitate the use of technology tools" ( $M = 3.69$ ,  $M = 4.19$ ) and item number two "The principal

reinforces staff to deal with frequent technical problems when they using technology.” ( $M = 3.87$ ,  $M = 3.86$ ).

Table 13: *Descriptive Statistics –Teachers’ perceptions of Systemic Improvement*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>3</b>	The principal provides adequate budget to facilitate the use of technology tools.	3.69	1.20
<b>5</b>	There is a clear policy in my school to purchase, maintain, upgrade, and/or replace technology tools on an ongoing basis.	3.70	1.20
<b>4</b>	The principal provides specialized staff to facilitate the use of technology in school (such as technical support technician, networks technician, and/or IT coordinator)	3.72	1.30
<b>6</b>	The principal is committed to upgrade the technology hardware and software to improve the performance of the various operations in the school.	3.76	1.21
<b>2</b>	The principal reinforces staff to deal with frequent technical problems when they use technology.	3.84	1.12
<b>7</b>	The principal encourages all teachers and staff to use technology for analyzing data; then interpreting and disseminating the results of school operations.	4.08	1.10
<b>1</b>	The principal provides adequate technical support to facilitate the use of technology in various operations (such as monitoring absenteeism, monitoring students' grades...etc.)	4.10	1.05
	Cumulative mean of systemic improvement	3.84	1.17

Table 14 shows the means and standard deviations for teachers’ perceptions for STANDARD V (Digital Citizenship). The cumulative mean score for this standard was the lowest score in all standards ( $M = 3.47$ ,  $SD = 1.32$ ) and all items mean scores were lower than 3.51. This gives an indication of whether the schools in Sharjah are systematically improving according to clear plans or not. As is the case

in other standards, principal cumulative mean scores were higher and were located in the "always" scale ( $M = 4.26$ ). Item number six, "Health-related instructions for using technology in my school are available and disseminated (such as proper seating in front of computers, number of hours of using computers...." has the lowest mean score at ( $M = 3.44$ ) and standard deviation was ( $SD = 1.40$ ). When we compare the mean score of this statement with that of principals' mean score, we can notice the big difference in the perceptions of both groups. Schools principals argued that they are always disseminating health-related instructions for using technology in their schools ( $M = 4.28$ ). On the other hand, item number four, "The principal respects the intellectual property rights for all technology products and advocates this concept among all stakeholders in the school" got the highest mean score at ( $M = 3.50$ ,  $SD = 1.31$ ). However, it is still lower than principals' mean score ( $M = 4.28$ ). Moreover, the other items mean scores are also lower than principals' mean scores.

Table 14: *Descriptive Statistics –Teachers' perceptions for Digital Citizenship*

	<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>6</b>	Health-related instructions for using technology in my school are available and disseminated (such as proper seating in front of computers, number of hours of using computers...)	3.44	1.40
<b>5</b>	All technology resources in my school are secured and protected when they are used by students.	3.46	1.35
<b>1</b>	There are equal opportunities for all students to get access to technology resources.	3.47	1.36
<b>2</b>	The technology resources are appropriate to the needs of all students in all grades.	3.47	1.24
<b>3</b>	There are policies and instructions in my school for the safe, legal, and ethical use of technology resources and tools.	3.50	1.36



<b>Items</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>4</b> The principal respects the intellectual property rights for all technology products and I advocate this concept among all stakeholders in the school.	3.50	1.31
Cumulative mean of digital citizenship	3.47	1.32

Table 15 summarizes principals' and teachers' mean scores for all standards. It is clear that principals' mean scores were in the very high range for each of the five standards. Their highest mean score ( $M = 4.43$ ), was for Standard III – Excellence in Professional Practice. The lowest mean score, although still very high and happening "always" at ( $M = 4.35$ ), was for Standard I – Visionary Leadership. The largest amount for variance occurred in the mean scores for Standard I – Visionary Leadership.

Table 15: *Cumulative means for the five scales from principals' and teachers' views*

Scale	Principals' means	Teachers' means
Visionary Leadership	4.20	3.76
Systemic Improvement	4.26	3.84
Digital Citizenship	4.26	3.47
Digital Age Learning Culture	4.35	3.99
Excellence in Professional Practice	4.43	4.07
Cumulative mean of all scales	4.30	3.82

As shown in table 14, the highest mean score ( $M = 4.43$ ) for teachers' perceptions were also for Standard III – Excellence in Professional Practice. While the lowest mean score, although still high and occurring "frequently" at ( $M = 3.47$ ), was for Standard V – Digital Citizenship with largest amount of variance ( $SD = 1.19$ ).

Based on cumulative means for the five standards of principals and teachers' mean scores for all items in all standards, they ranged between "occasionally" and "always." The standard deviation of teachers' mean scores ( $SD = 1.03$ ) were higher than principals' mean scores ( $SD = .52$ ), indicating that the answers for teachers were dispersed from the mean more than those of principals. This can mean that answers of principals were more converging toward the mean.

The cumulative mean score of principals scale ( $M = 4.30$ ) shows that schools principals "always" integrate technology in their schools based on NETS-A Standards, while the cumulative mean score of teachers of ( $M = 3.82$ ) indicates that principals "frequently" integrate technology in their schools based on NETS-A Standards.

### **Differences in Technology Integration Based on the Gender of Principals**

To find if there were any significant differences in technology integration based on the principal's gender, T-test was conducted. The results showed that there were significant differences only in Standard II "Digital Age Learning Culture." There was a significant difference in the female ( $M = 4.47$ ,  $SD = .46$ ) and male ( $M = 4.12$ ,  $SD = 0.35$ ) groups;  $t(32) = -2.33$ ,  $p = 0.026$ . This means that female principals were more able to create a "digital learning culture" in their schools more than males did.

Moreover, when T-test was computed for the items of the all standards, the results showed that significant differences were found in principals' responses for some items in Standards II, IV, and V in **favor of female principals**. The significant differences were found in the following items:

In item number nine of Standard II, the results show that female principals encourage teachers more than male principals to use technology frequently and effectively in their teaching to improve students' higher thinking and problem-solving skills. There was a significant difference in female principals results of ( $M=4.67$ ,  $SD=0.66$ ) and male ( $M=4.23$ ,  $SD=0.44$ ) groups;  $t(32) = -2.109$ ,  $p = 0.043$ ".

In item number three of the same standard, the results show that female principals also reward teachers who use technology creatively in their teaching more than male principals. A significant difference was found in the results in favor of female ( $M=4.48$ ,  $SD=0.68$ ), compared to male ( $M=3.83$ ,  $SD=0.72$ ) groups;  $t(31) = -2.56$ ,  $p = 0.015$ ".

In item number four of standard II, the results show that female principals direct teachers to use technology for analyzing and interpreting students' data to improve the teaching practices more than male principals. There was a significant difference in female principals results ( $M=4.55$ ,  $SD=0.51$ ) and male ( $M=4.00$ ,  $SD=0.71$ ) groups;  $t(31)=2.59$ ,  $p = 0.014$ ".

In item number seven of Standard IV, the results show that female principals are committed to upgrade the technology hardware and software to improve the performance of various operations in the school more than male principals. There was a significant difference in female principals' results at ( $M=4.38$ ,  $SD=0.58$ ) and male ( $M=3.86$ ,  $SD=0.86$ ) groups;  $t(33)=-2.14$ ,  $p = 0.041$ ".

In item number six of Standard V, the results show that female principals disseminate health-related instructions for using technology in my school (such as proper seating in front of computers, number of hours to use computers, etc.) more than male principals. There was a significant difference in difference in female

principals' results at ( $M= 4.55$ ,  $SD= 0.51$ ) and male ( $M= 3.86$ ,  $SD= 0.86$ ) groups;  $t(32)= -2.94$ ,  $p = 0.006$ ".

To summarize, female principals encourage teachers to use technology frequently and effectively in their teaching to improve students' higher thinking and problem-solving skills more than male principals. Moreover, they reward teachers who use technology creatively in their teaching more than male principals. They direct teachers to use technology for analyzing and interpreting students' data to improve the teaching practices. They are committed to upgrade the technology hardware and software to improve the performance of various operations in the school. Finally, they disseminate health-related instructions for using technology in their school (such as proper seating in front of computers, number of hours to use computers, etc.) more than male principals.

### **Challenges Facing Sharjah School Principals in Integrating Technology**

To answer this question the "frequency" of each challenge to the last question in the questionnaire was calculated. Table 16 shows that item number one "High cost of integrating technology and lack of funding" was the most important challenge that faces them in integrating technology in their school (Frequency = 35). The second challenge was item number six "Continuous production of new technology tools and the inability to cope with them" (Frequency = 23). Lack of professional development programs for using technology was the third challenge that faces Sharjah government schools principals (Frequency = 19). Lack of qualified teachers was also considered as a challenge that faces Sharjah government school principals in integrating technology (Frequency = 13).

Table 16: *Frequency of the challenges as mentioned by principals*

	<b>Challenges</b>	<b>Frequency</b>
<b>2</b>	Lack of the principal knowledge in technology.	2
<b>3</b>	Lack of the staff knowledge in technology.	6
<b>5</b>	Staff resistance to use technology.	12
<b>4</b>	Lack of skilled and qualified teacher in integrating technology.	13
<b>7</b>	Lack of professional development programs for using technology.	19
<b>6</b>	Continuous production of new technology tools and the inability to cope with them.	23
<b>1</b>	High cost of integrating technology and lack of funding.	35

## CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

This study had multiple purposes. The first one was to describe the state of technology integration in Sharjah City Government Schools based on a juxtaposition and comparison of principals' perceived practices of technology integration and teachers' perceptions. This technique of study would help in reaching a more trusted image of technology integration at Sharjah schools. The second purpose was to investigate the influence of the principal gender on integrating technology in their schools. The final purpose of this study was to identify the main challenges that faced Sharjah government schools' principals in integrating technology in their schools. This chapter explains the findings of the study and clarifies the implications of this study for practice and further research.

### Discussion of Research Question 1

The first research question investigated the perceptions of schoolteachers and principals on the integration of technology in Sharjah Government Schools. The findings indicated that a difference exists between principals and teachers' perceptions of Sharjah City Government School principals' ability to integrate technology in their schools based on NETS-A.

The cumulative mean score of principals scales ( $M= 4.30$ ) shows that Sharjah schools principals "always" integrate technology in their schools based on NETS-A Standards, while the cumulative mean score of teachers of ( $M = 3.82$ ) indicates that principals do "not always" integrate technology. The principal mean scores for the five standards were significantly higher than the teachers' mean scores. One explanation of this findings is that Sharjah schools' principals might have

overestimated the level in which they integrate technology into the administration of their schools. In fact, they might have perceived their responses to the survey items as related to evaluation of their performance or that they were worried that the MoE might be informed about the results. It is also possible that they did not fully understand the performance indicators of (NETS-A).

### **Visionary Leadership**

Principals' results indicate a high agreement on the idea that leaders in Sharjah schools in general had clear visions in leading technology integration in schools. However, Standard I (Visionary Leadership) was the least level achieved in comparison to the other standards. The responses to some items were inconsistent with others. For example, the principals referred to them as always using technology to collect and analyze data in order to develop their schools improvement plans, and that they have clear visions to achieve the comprehensive integration of technology. These two reported perceptions were in contradiction to the idea that they do not always develop or implement strategic plans for using technology to achieve the vision of technology integration. The last point was consistent with teachers' argument that principals are not always disseminating a vision of using technology in their schools. The interpretation might be that they could not understand what the vision of technology integration means. In addition, they could not distinguish between having a vision on the level of the school and having a vision for technology integration. In other words, they might have considered including technology in some parts of the school strategic plans as a planning for a vision in technology integration in schools.

Teachers' results revealed that the principals do not always set clear visions for technology integration nor do they implement strategic plans for achieving the technology vision. In addition, teachers' results show that they are not always involved in the planning process for using technology, which is a contradiction to principals' responses. As previously stated, teachers could be considered more objective than principals in assessing the planning processes for integrating technology in their schools because they are not considering it as an assessment for their performance and practices. It seems also that the principals might have been biased in assessing their practices in planning for technology integration. Moreover, even if we accept the existence of visions for the integration of technology, not all school principals and teachers adhered to forming these visions and strategic plans in the proper ways. Some might consider forming them as another obligatory duty that should be performed periodically just to show compliance with the system or to use it for the purposes of school annual assessment.

Based on the results, school principals' competency in "Visionary Leadership" was not high, which meant that planning for visionary integration of technology in Sharjah City Government Schools was not always performed. One reason for this might be that school principals were not heavily involved in the planning process of technology integration with the MoE. Legislation, instructions, and educational policies come from the Ministry, while the role of school principals was limited to applying them in their schools.

The significant variance in principals' responses for item five "I develop policies and programs that support technology integration practices, particularly research-informed practices" gives extra evidence that Sharjah City School principals



rely on the MoE to develop policies and programs for supporting technology integration in their schools.

Finally, we should not be surprised by the fact that principals' competency in "Visionary Leadership" toward technology integration was the lowest in comparison to other standards. In fact, this finding is consistent with Seay (2004), Duncan (2011), and (Banoglu, 2011).

### **Digital Age Learning Culture**

The mean scores for teachers and principals for Standard II (Digital Age Learning Culture) and Standard IV (Excellence in Professional Practice) were the highest. Principals' results show that they are always achieving the performance indicators of both standards, which means there is a culture for digital age learning in Sharjah schools and there is excellent professional practice in integrating technology in schools. This can be seen as a reflection of the commitment of the MoE to equip schools with technological resources in order to meet the needs of an advanced education system. This is obvious in the steps taken by the MoE strategies such as converting curriculum to smart applications since 2013. It is expected that most of the curriculum will be on smart devices in 2015. Further, the MoE was keen in distributing tablets to students in government schools so they can make use of these applications.

On the other hand, the MoE provided novice teachers with training courses for integrating technology in learning. Based on the perceptions of principals in item eight, there is insufficient high quality professional development to support this culture. The results indicate that school principals do not always assess training needs of teachers for the purpose of integrating technology. This might be because

the MoE is responsible for providing teachers with professional development regardless of their real needs of training, and the role of principals is just to inform teachers and facilitate their attendance. They cannot provide any professional development for teachers without the formal approval from the Ministry.

At the same time, teachers and principals viewed the digital age learning culture in schools differently. Teachers' results indicate that principals do not always support the culture of digital age learning in Sharjah schools. Teachers believe that principals always reinforce the use of technology to improve teaching but they do not always reward teachers who use technology creatively in their teaching. The surprising matter is that school principals believe that they always reward teachers. In other words, there is disagreement between teachers and principals on the kinds of reward and the frequency. Another interpretation is the possibility of having two views on what reward is supposed to be given to teachers who integrate technology.

Teachers' results indicate that principals do not always offer time and financial support for teachers who wish to attend special events on using technology while principals' responses showed that they always do that. This difference in their perspectives could be for various reasons. First, schools principals take into account many considerations when they release time for teachers to attend special events. They are concerned with management issues such as who will substitute for the teachers. Second, the educational system in the UAE is not a totally decentralized system. Therefore, school principals do not have sufficient authority on budget issues, and they have to stick to their schools' budgets and allocations. Although there is free training on using technology conducted in the UAE, some principals believe that the MoE should be responsible for providing financial support for teachers to attend technology training,

Teachers believe that the learning environment in their school is not always equipped with technological resources to meet the needs of diversified and individualized learning. Principals disagree in their results with teachers' perception saying that the learning environment is equipped with technological resources. Perhaps school principals believe that technology resources are limited to providing computers and projectors and then the job of teachers should be to use them properly to achieve differentiation in students learning. Not all schools were included in the e-tablet project that was launched by the Ministry two years ago, so technological tools that help individualized learning are still limited in most of Sharjah schools. On the other hand, we cannot forget that some teachers might be trying to find excuses regarding the non-availability of technological resources to disguise shortcomings of their work, and some of them might be considering using technology as an extra burden added to the other burdens of routine teaching.

### **Excellence in Professional Practice**

Based on the results, there is a good level of excellence in professional practice in integrating technology in Sharjah schools. Schools principals are always using technology daily to improve, develop, and support school operations, and they always communicate with teachers, administrators, and parents via technology. This is because all government schools are obligated to use the MoE student information system (I-SIS) to manage student information. The United Arab Emirates is by all means considered advanced in the area of using technology in all ministries and governmental bodies. Most governmental transactions are becoming electronic. The United Arab Emirates was ranked at the top of Arab countries in the Arab World Competitiveness Report published in April 2007 with its focus on excellent service in ICT (Hanouz, El Diwany, & Yousef, 2007). The United Arab Emirates has

adopted the government's smart initiative at the beginning of 2014. Hopefully it will transform to smart government in 2017. Consequently, school principals' use of technology in their daily tasks became mandatory to conduct the affairs of their schools and communicate with teachers, administrators, parents, and the outside community.

Teachers' results show that schools principals are not always using technology to support school operations, and do not always communicate with teachers, administrators, or parents using technology. Moreover, they believe that school principals do not always present a role model in using technology in their administrative work. Perhaps school principals were biased in reporting themselves when they responded to the survey and they overestimated themselves in using technology for professional practice. The result that not all teachers are familiar with what school principals do with technology to conduct school business supports this idea.

The results show that principals always value the initiatives offered by teachers who use technology, but ironically, they do not always provide them with necessary professional development, particularly, knowledge and skills needed for integration. Teachers, on the other hand, believe that principals do not always value their initiatives, and this is consistent with their belief that principals do not always reward them when they use technology creatively in their teaching.

### **Systemic Improvement**

There is disagreement between principals and teachers in their perspectives about Standard IV (Systemic Improvement). Based on the results, Sharjah school principals are always improving their schools through the effective use of technology

resources and keeping pace with the digital age. Teachers' results indicate that Sharjah School Principals do not always improve their schools through the effective use of technology resources and they do not always keep pace with the digital age.

While they were divergent on the above points, both of them agreed that principals do not always provide adequate budget to facilitate the use of technology tools in their schools. This is because of the centrality of educational system and the fact that school principals have no authority to determine the amount of school budget. Allocations are often fixed. The Ministry of Education and its regional offices are responsible for major responsibilities and tasks to support and manage systemic operations. They are responsible for the development, implementation, and monitoring of policies and guidelines to: 1) ensure compatibility of technologies, 2) allocate human and financial resources for implementing technology plans, 3) and lead the systemic improvement of technology systems and support the technology replacement cycles. Thus, school principals are not responsible to perform these tasks and this leads to decreasing their proficiency in this field.

### **Digital citizenship**

Another disagreement between principals and teachers in their perceptions arises in Standard V (Digital Citizenship). Based on the results, Sharjah School principals have positive perceptions and care about digital citizenship. They are always taking care of social, legal, and ethical issues related to using technology in their schools. In 2002, the United Arab Emirates announced a new copyright law titled Federal Law (No. 7) of 2002 (UAE) Pertaining to Copyrights and Neighboring Rights (UAE Copyright Law and Neighboring Rights, 2002). This law compels school principals to abide by intellectual property rights in using technology

resources and tools. The law in the United Arab Emirates criminalizes violators and exposes them to high financial penalties. In the same time, the MoE is committed to provide schools with legal and original technological resources and tools. Schools' principals have no authority to provide their schools with technological tools and their roles are just to assure the proper use for these tools.

Teachers have different perspectives for this standard. The cumulative mean for this standard was the lowest comparing to other standards ( $M=3.47$ ), and it was significant when compared with the principals' cumulative mean ( $M=4.26$ ). Thus, teachers believe that Sharjah schools do not always care for the social, legal, and ethical issues related to using technology. They disagree with the view of school principals in the provision of policies and instructions in their school for the safe, legal, and ethical use of technology resources and tools, especially health-related instructions. Teachers might not pay attention to or are not always familiar with all policies and instructions in this regard or perhaps there are shortcomings in the effective implementation of policies and follow-up activities. On the other hand, the researcher expects that there is a misunderstanding to the concept of digital citizenship. Perhaps principals connected it to the concept of loyalty to the UAE, and did not just consider it in connection to the digital world. There is another possible reason. School principal were not willing to disclose the level of digital citizenship in their schools to avoid sanctions if the survey results reached the official authorities.

## Discussion of Research Question 2

Research question two sought to investigate the differences in technology integration based on the principal gender. The results showed that there were no significant differences in all standards except Standard II “Digital Age Learning Culture.” The significant difference in this standard was in the favor of female ( $M=4.47$ ,  $SD=.46$ ) and male ( $M=4.12$ ,  $SD=0.35$ ) groups;  $t(32)=-2.33$ ,  $p=0.026$ . This means that female principals are more able to create digital learning cultures in Sharjah schools more than male principals did. On the other hand, there were significance differences in certain items in Standard IV and one item in Standard V.

Based on the results, female principals in Sharjah schools encourage teachers -more than male principals - to use technology frequently and effectively in their teaching to improve students’ higher thinking and problem-solving skills. Moreover, they reward teachers who use technology creatively in their teaching more than male principals. They direct teachers to use technology for analyzing and interpreting students' data to improve the teaching practices. They are committed to upgrade the technology hardware and software to improve the performance of various operations in the school. Finally, they disseminate health-related instructions for using technology in school (such as proper seating in front of computers, number of hours to use computers, etc.) more than male principals.

These results are consistent with the persistent efforts undertaken by the UAE government in integrating women into the development process and enabling them to consolidate their positions within society to activate their roles in the social and economic development in the country. The UAE is committed to provide opportunities for women to get the knowledge, skills, and quality services and give

them equal opportunities in work, payment, career promotion, and access to leadership positions in a variety of work sectors.

Many studies (Alkrdem, 2013; Anderson and Dexter (2005; Duncan, 2011; Eren , Kurt, and Askim, 2011; and Nordin, Yusof, and Jusoff, 2010 ) found that there were no significant differences between female and male principals in the technological leadership behavior for all standards. Therefore, based on these studies principals' gender should not influence the integration of technology. On the other hand, May (2003), as mentioned in Duncan (2011), conducted a study using NETS-A to survey the impact of technology on job effectiveness of high school principals in seven counties in Northern Illinois. He found significant differences between male and female principals in favor of females. The results of the current study are consistent with those of May in Standard II only. Many factors can explain this male-female difference. It may be because the numbers of female principals is more than that of male principals in Sharjah schools. Another reason might be due to the fact that the majority of female principals in Sharjah are local citizens, which means they are more eager to implement national educational strategies more than non-local citizens. A third possibility goes with the nature of female versus male leadership style and their views on how to carry out the operations of the school. Generally, male principals do not pay much attention to details while females do. Males might be satisfied with the overall picture of school functioning while females dig deeply into every aspect.

Based on Yukl (2002), as mentioned in Kinicki and Williams (2009), females are considered more sensitive, have more insight, and have the ability to work with diverse people. Some studies suggested that female teachers are more widely using active-diverse practices in teaching, compared to men, where men tend to use a style



of lectures and imparting of information (Larid, Garver, & Niskodé, 2007). Thus, since female school principals are basically teachers and most of them have more years of experience than males before they became principals, this will be reflected in their future styles in using various methods and means, including tools of technology, which gave them an advantage in standard II. In addition, females in administrative positions tend to put more focus on motivation, cooperation, affiliation, communication, and nurturing (Kinicki & Williams, 2009). So, if female school principals tend to use those skills with their teachers, it would support the digital age learning culture in their schools.

### **Discussion of Research Question 3**

The third question investigated the main challenges that faced Sharjah School principals in integrating technology in their schools. The results showed that item number one “High cost of integrating technology and lack of funding” was the most important challenge that faced principals in integrating technology in their schools (Frequency = 35). The interesting point is that the MoE is very much engaged in developing schools by adopting strategies for using technology in teaching and learning. In order to do this, it provides schools with the most recent technology tools and modern platforms. It also directs school principals to utilize those tools effectively. In fact, schools principals are not responsible for funding this aspect in their schools. It can be understood that they blame the MoE partially for the challenges they face in technology integration.

The second challenge was item number six “Continuous production of new technology tools and the inability to cope with them” (Frequency = 23). This point is a challenge not only experienced by government school principals but all educators

worldwide. Technology tools and infrastructures are always upgrading and new versions of software and hardware are launched every few months. This could cause a barrier for principals to integrate technology effectively due to the absence of support for old versions of technologies from suppliers and due to hardware and software incomparability issues. However, it is a necessity to cope with the most recent technologies to have an effective technological environment at schools. Therefore, school principals can focus their efforts on tools and platforms they already have and build on them as much as they can.

The third challenge that faced Sharjah School principals was the lack of professional development programs for using technology (Frequency = 19). This point is linked to the second challenge. As mentioned above, new technologies are continuously produced—a fact that triggers continuous and proper training for using these new technologies. However, we should not forget that the MoE is responsible for providing schools with professional development programs for using technology. It seems that these programs are not sufficient for school personnel to move to effective integration of technology in their schools. This is compounded by the fact that school principals have insufficient authority to provide their teachers with suitable training through external parties without taking approvals from the MoE. They have to adhere to the approved budget, thus, they have not enough funds to subsidize the cost of external training. The insufficient training for using technology will lead to ineffective use of technology or integrate technology in improper ways for teaching.

The fourth challenge that faced Sharjah School principals is the lack of skilled and qualified teachers in integrating technology (Frequency = 13). Having a certificate of ICDL is one condition of hiring teachers to work in government

schools, however, ICDL is not enough to enable teachers to deal with all sorts of technology because it focuses on basic use of some computer skills and applications. Thus, it is the responsibility of the MoE and schools to provide them with proper training to help them to integrate technology tools effectively in learning. We have to remember that Sharjah School principals have no authority to hire teachers or trainers at their schools - even on a temporary basis – to help in providing training and guidance to other teachers. Their role is limited to determining staff needs and informing the MoE to supply those teachers. On the other hand, the culture of using technology in education is still not disseminated among all teachers and this affects their desire to be well skilled with technology and integrating it in learning.

### **Implications and Recommendations**

The concept of standards is widespread and standards are heavily used by educational circles in the UAE. However, there are no specific or written standards for school principals to integrate technology in schools in the UAE as can be found in the USA or other countries. In fact, the USA has adopted national standards for integrating technology since 1990s. For this reason, principals and teachers' responses to the survey items could have been affected by their unfamiliarity with the technology standards NETS-A.

The results of this study have significant implications for stakeholders including the MoE, ADEC, university preparation programs of school leaders, and school districts in terms of professional development programs. Specifically, the professional development office at Sharjah Educational Zone should provide more opportunities of professional development for principals based on their real needs for technology integration. The other implication is the obvious need to train school

principals on specific issues such as having leadership visions in integrating technology in their school functions and promoting teachers and other staff technology integration and innovation activities.

Based on the results of this study, the researcher provides the following recommendations:

- 1- Concerted efforts should be done to identify and develop national standards for administrators to integrate technology in their schools through a collaborative effort between the MoE, educational institutions, and universities in the country.
- 2- Efficient and sufficient professional development and support should be given to school principals and teachers to integrate educational technologies in their schools.
- 3- School principals should be asked to register in post-graduate education programs that focus on leadership with technology.
- 4- School principals' skills and attitudes in leadership with technology should be taken in consideration for hiring them in that important position.
- 5- More involvement of schools principals should be considered in designing teachers' professional development programs for using technology.
- 6- Sharjah School principals need continuous professional development on creating visions and strategies for technology integration in their schools.
- 7- Sharjah School principals need additional education on particular legal and ethical responsibilities for dealing with technology.

The following are some recommendations for further research:

First, this study was conducted on Sharjah School Principals and since this is the first study of its type in UAE, conducting a replication study on different

locations and demographic factors would provide validation of the findings of this study and would make it possible to generalize the findings to all UAE government schools.

Second, studies on technology leadership are considered new; thus, conducting research through using different methodologies would be useful. For example, a qualitative study would provide in depth understanding of principals' technology leadership practices.

Third, this study addressed the technology leadership practices in government schools; conducting further research on private schools would serve the validity of findings and could make it possible to generalize the findings over all UAE schools.

Finally, conducting further research with superintendents and other school district-level administrators would strengthen the studies of leadership practices for technology integration.

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**APPENDIX A**

**ISTE KEY PERFORMANCE INDICATORS**

## **ISTE KEY PERFORMANCE INDICATORS**

ISTE National Educational Technology Standards (NETS) and Performance Indicators for Administrators (Developed by the TSSA Collaborative and adopted by ISTE NETS).

- I. LEADERSHIP AND VISION**—Educational leaders inspire a shared vision for comprehensive integration of technology and foster an environment and culture conducive to the realization of that vision.

*Educational leaders:*

- A. facilitate the shared development by all stakeholders of a vision for technology use and widely communicate that vision.
- B. maintain an inclusive and cohesive process to develop, implement, and monitor a dynamic, long-range, and systemic technology plan to achieve the vision.
- C. foster and nurture a culture of responsible risk-taking and advocate policies promoting continuous innovation with technology.
- D. use data in making leadership decisions.
- E. advocate for research-based effective practices in use of technology.
- F. advocate, on the state and national levels, for policies, programs, and funding opportunities that support implementation of the district technology plan.

- 2. LEARNING AND TEACHING**—Educational leaders ensure that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching.

*Educational leaders:*

- A. identify, use, evaluate, and promote appropriate technologies to enhance and support instruction and standards-based curriculum leading to high levels of student achievement.
- B. facilitate and support collaborative technology-enriched learning environments conducive to innovation for improved learning.
- C. provide for learner-centered environments that use technology to meet the individual and diverse needs of learners.
- D. facilitate the use of technologies to support and enhance instructional methods that develop higher-level thinking, decision making, and problem-solving skills.
- E. provide for and ensure that faculty and staff take advantage of quality professional learning opportunities for improved learning and teaching with technology.

- 3. PRODUCTIVITY AND PROFESSIONAL PRACTICE**—Educational leaders apply technology to enhance their professional practice and to increase their own productivity and that of others.

*Educational leaders:*

- A. model the routine, intentional, and effective use of technology.
- B. employ technology for communication and collaboration among colleagues, staff, parents, students, and the larger community.
- C. create and participate in learning communities that stimulate, nurture, and support faculty and staff in using technology for improved productivity.

- D. engage in sustained, job-related professional learning using technology resources.
- E. maintain awareness of emerging technologies and their potential uses in education.
- F. use technology to advance organizational improvement.

**4. SUPPORT, MANAGEMENT, AND OPERATIONS**—Educational leaders ensure the integration of technology to support productive systems for learning and administration.

*Educational leaders:*

- A. develop, implement, and monitor policies and guidelines to ensure compatibility of technologies.
- B. implement and use integrated technology-based management and operations systems.
- C. allocate financial and human resources to ensure complete and sustained implementation of the technology plan.
- D. integrate strategic plans, technology plans, and other improvement plans and policies to align efforts and leverage resources.
- E. implement procedures to drive continuous improvements of technology systems and to support technology replacement cycles.

**5. ASSESSMENT AND EVALUATION**—Educational leaders use technology to plan and implement comprehensive systems of effective assessment and evaluation.

*Educational leaders:*

- A. use multiple methods to assess and evaluate appropriate uses of technology resources for learning, communication, and productivity.
- B. use technology to collect and analyze data, interpret results, and communicate findings to improve instructional practice and student learning.
- C. assess staff knowledge, skills, and performance in using technology and use results to facilitate quality professional development and to inform personnel decisions.
- D. use technology to assess, evaluate, and manage administrative and operational systems.

**6. SOCIAL, LEGAL, AND ETHICAL ISSUES**—Educational leaders understand the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues.

*Educational leaders:*

- A. ensure equity of access to technology resources that enable and empower all learners and educators.
- B. identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology.
- C. promote and enforce privacy, security, and online safety related to the use of technology.
- D. promote and enforce environmentally safe and healthy practices in the use of technology.
- E. participate in the development of policies that clearly enforce copyright law and assign ownership of intellectual property developed with district resources.

**APPENDIX B**

Permission Letter

To Collect Data from schools within Sharjah Education Zone

20 April 2014



To: Head, Sharjah Education Zone, Ministry of Education

Fr: Steven T. Bossert, Dean and Professor



Re: Permission for Master of Education Student to Collect Data in Sharjah Education Zone

Mr. Samer Abdel Khaleq Al Saleh [201180810@uaeu.ac.ae](mailto:201180810@uaeu.ac.ae) is a student in good standing in the Master of Education Program at the UAEU College of Education. He is ready to conduct research for his thesis and wants to collect questionnaire data in the Sharjah Education Zone. His study and academic work is being done under the supervision of Dr. Ali Ibrahim, Associate Professor of Education, who serves as his academic and thesis advisor.

I request that the Sharjah Education Zone grant permission for Mr. Samer to conduct his research.

**APPENDIX C**

Approval Letter

To Collect Data from schools within Sharjah Education Zone



التاريخ : ٢٠١٤/٥/١ م

تعميم رقم (١٥٦٥) لسنة ٢٠١٤ م  
بشأن تسهيل مهمة

المحترمين

السادة / مديرو ومديرات المدارس الحكومية ...

السلام عليكم ورحمة الله وبركاته.. وبعد

يطيب لنا أن نرفع لكم خالص امتناننا وتقديرنا لتعاونكم المثمر متمنين لكم دوام التقدم والازدهار .  
يسرنا ان نرفق لكم كتاب جامعة الإمارات العربية / كلية التربية بشأن عمل دراسة واستبيان  
لمشروع دراسة الماجستير للطلاب / سامر عبدالخالق الصالح .  
لذا نرجو منكم تسهيل مهمة الباحث والتعاون معه

شاكرين ومقدرين حسن تعاونكم..

وتفضلوا بقبول وافر التقدير والاحترام.

مدير إدارة منطقة الشارقة التعليمية

٥

صادر // قسم العمليات التربوية / وحدة التدريب والتطوير  
البريد الإلكتروني: moe.gov.ae@training.unif.shj  
للتواصل والاستفسار: ٠٦٥٠٧٧٥٢٢  
رئيسة قسم العمليات التربوية .....  
مرفق / كتاب جامعة الإمارات / كلية التربية

J.M.S



**APPENDIX D**

Principals' Cover letter



السيدة/ المدير/ة.....المحترم/ة

حبة طيبة وبعد،

هذه الاستبانة جزء من دراسة للحصول على درجة الماجستير في كلية التربية في جامعة الإمارات العربية المتحدة. وتهدف الرسالة إلى تحديد مدى دمج التكنولوجيا في التعليم من قبل مدراء مدارس مكتب الشارقة التعليمي في مدارسهم من وجهة نظر المدراء و المعلمين في الميدان التربوي وفق المعايير العالمية.

بمجرد إجابتك على بنود الاستبانة وإعادتها يعتبر ذلك موافقة ضمنية من قبلكم للمشاركة في هذه الدراسة. علما بأن المشاركة تطوعية و لن يطلب منكم كتابة أسمائكم أو أسماء مدارسكم وسيتم التعامل مع استجاباتكم بسرية تامة ولن يتم استخدامها إلا لأغراض الدراسة فقط.

يرجى التكرم بالإجابة على كافة بنود الاستبانة بعناية ودقة وموضوعية والحرص على عدم مناقشتها مع الزملاء إلا بعد الانتهاء منها. وستستغرق الإجابة عليها فقط 10 دقائق بحد أقصى.

لمزيد من المعلومات أو الاستفسار يرجى التواصل مع الباحث على البريد الإلكتروني [www.201180810@uaeu.ac.ae](mailto:www.201180810@uaeu.ac.ae)

شاكرا لكم حسن تعاونكم ومشاركتكم.

وتفضلوا بقبول فائق التقدير والاحترام.

الباحث

سامر الصالح

**APPENDIX E**

Principals' Survey

### استبانة مدير المدرسة A School Principal Survey

<input type="checkbox"/> Male ذكر		<input type="checkbox"/> Female أنثى		الجنس
<input type="checkbox"/> Bachelor بكالوريوس		<input type="checkbox"/> Master ماجستير		<input type="checkbox"/> PHD دكتوراه
<input type="checkbox"/> Less than 5		<input type="checkbox"/> 5-10		<input type="checkbox"/> 10-15
				<input type="checkbox"/> More than 15
معلومات المدرسة				
<input type="checkbox"/> Public حكومي		<input type="checkbox"/> Private خاص		نوع التعليم
<input type="checkbox"/> 1-5		<input type="checkbox"/> 6-9		<input type="checkbox"/> 10-12
<input type="checkbox"/> Girls بنات		<input type="checkbox"/> Boys بنين		الحلقة

#### تعريفات

التكنولوجيا: تشير إلى أجهزة الحاسوب الشخصية، وأجهزة الشبكات وأجهزة الحوسبة الأخرى (على سبيل المثال، ألواح الكتابة الإلكترونية والمساعدات الرقمية الشخصية (PDAs))، وتشمل البرمجيات، والوسائط الرقمية، وأدوات الاتصال مثل الإنترنت والبريد الإلكتروني، والأقراص المدمجة، والمؤتمرات المنفذة عن طريق الفيديو وتطبيقات الموبايل.

في الصفحات الآتية أختار من المقياس التالي ما تراه يمثل وجود وتحقق البنود أدناه في واقع مدرستك الحقيقي

وليس ما تظن أو تقتنع بأنه الصواب:

1	2	3	4	5
أبداً	نادرًا	أحيانًا	كثيرًا	دائمًا

1	2	3	4	5
أبداً	نادراً	أحياناً	كثيراً	دائماً

### أولاً: قيادة ذات رؤية

#	البند	1	2	3	4	5
1	لدى مدرستي رؤية (Vision) واضحة لتحقيق الدمج الشامل للتكنولوجيا* وذلك من أجل دعم الممارسة المهنية الفاعلة.					
2	أقوم بنشر رؤية لاستخدام التكنولوجيا وإشهارها بين جميع المعنيين في المدرسة مع توضيح التوقعات من استخدام التكنولوجيا.					
3	أقوم بتنفيذ خطة استراتيجية للتكنولوجيا تحقق رؤية دمج التكنولوجيا إن وجدت.					
4	أعمل على مشاركة المعلمين والعاملين في عملية التخطيط لاستخدام التكنولوجيا في مدرستي.					
5	أقوم بتطوير سياسات تدعم ممارسات دمج التكنولوجيا وخصوصاً الممارسات المستندة إلى البحث العلمي.					
6	أستخدم التكنولوجيا لجمع وتحليل البيانات من أجل وضع خطة تحسين المدرسة.					
7	أشارك في الأنشطة التي تهدف لتحديد أفضل الممارسات في مجال استخدام التكنولوجيا لإدارة المدرسة (على سبيل المثال: حضور المؤتمرات واجتماعات المنطقة التعليمية)					

### ثانياً: ثقافة التعلم في العصر الرقمي

#	البند	1	2	3	4	5
1	أعزز استخدام التكنولوجيا لتحسين التدريس.					
2	أحث المعلمين على الاستخدام المتكرر والفاعل للتكنولوجيا في التعلم من أجل تنمية مهارات التفكير العليا وحل المشكلات لدى الطلبة.					
3	أقوم بمكافأة المعلمين الذين يستخدمون التكنولوجيا في تدريسهم بطريقة إبداعية.					
4	أوجه المعلمين إلى استخدام التكنولوجيا لتحليل وتفسير بيانات الطلبة لتحسين ممارسات التدريس.					
5	أوفر بيئة تعلم مجهزة بمصادر تكنولوجية مختلفة وذلك من أجل تلبية احتياجات تنوع التعليم وتفريده.					
6	أعتبر قدوة للمعلمين في مدرستي في تقديم أفضل ممارسات التدريس باستخدام التكنولوجيا.					
7	أقوم بتقييم احتياجات المعلمين التدريبية الخاصة باستخدام التكنولوجيا.					
8	أوفر تطويراً مهنيّاً ذو جودة عالية لدعم دمج التكنولوجيا في تحسين تعلم الطلبة.					
9	أدعم المعلمين الراغبين في حضور فعاليات خاصة باستخدام التكنولوجيا في التدريس (الوقت، الدعم المادي، ..).					

1	2	3	4	5
أبداً	نادراً	أحياناً	كثيراً	دائماً

### ثالثاً: التميز في الممارسة المهنية

#	البند	1	2	3	4	5
1	أقدم مثلاً يحتذى به في استخدام التكنولوجيا للموظفين في جميع أعمالي الإدارية.					
2	أتواصل مع المعلمين والموظفين وأولياء الأمور والمجتمع باستخدام أدوات التكنولوجيا.					
3	أستخدم التكنولوجيا في تحسين وتطوير ودعم عمليات المدرسة (مثل: حفظ الملفات، إدارة الميزانيات، تنظيم معلومات الطلبة، بناء جداول الحصص،...)					
4	أواكب المنتجات التكنولوجية الحديثة التي يمكن أن تستخدم في التعليم.					
5	أشجع الموظفين على استخدام التكنولوجيا لتحسين إنتاجيتهم.					
6	أشارك في أنشطة التنمية المهنية المتعلقة بتحسين استخدام التكنولوجيا في الإدارة.					
7	أوظف نتائج التقييم الخاصة باستخدام التكنولوجيا في التطوير المهني واتخاذ القرارات.					
8	أقدر المبادرات التي يقدمها المعلمون والعاملون والتي يتم فيها استخدام التكنولوجيا.					

### رابعاً: التحسين الشامل

#	البند	1	2	3	4	5
1	أوفر دعماً كافياً لتسهيل استخدام التكنولوجيا في العمليات المختلفة (مثل: رصد الغياب، رصد درجات الطلاب، ...)					
2	أستطيع التعامل مع المشكلات التقنية المتكررة عند استخدام الحاسوب.					
3	أوفر ميزانية مالية مناسبة لتسهيل استخدام أدوات التكنولوجيا ومصادر ها.					
4	أوفر كوادر بشرية مختصة لتسهيل استخدام ودمج التكنولوجيا في المدرسة (مثل: فني دعم وصيانة الشبكات والتقنيات أو منسق التكنولوجيا)					
5	توجد سياسة واضحة في مدرستي لشراء، صيانة، تحديث، أو استبدال أدوات التكنولوجيا على أساس مستمر.					
6	أقوم بتقييم مواصفات وتكاليف الأجهزة والبرمجيات قبل الشروع في عملية الشراء.					
7	أحرص على تطوير الأجهزة والبرمجيات لتحسين القيام بالعمليات المختلفة في المدرسة.					
8	أوجه المعلمين والعاملين نحو استخدام التكنولوجيا لتحليل البيانات وتفسير ونشر نتائج عمليات المدرسة.					

1	2	3	4	5
أبداً	نادراً	أحياناً	كثيراً	دائماً

#### خامساً: المواطنة الرقمية

#	البند	1	2	3	4	5
1	أوفر فرصاً متساوية لجميع الطلبة للوصول لمصادر التكنولوجيا.					
2	أعمل على توفير مصادر للتكنولوجيا ملائمة لاحتياجات جميع الطلاب على اختلاف مستوياتهم.					
3	يوجد في مدرستي سياسات وتعليمات للاستخدام الآمن والقانوني والأخلاقي لمصادر التكنولوجيا وأدواتها.					
4	أحرص على نشر مفهوم حقوق الملكية الفكرية لجميع منتجات التكنولوجيا بين جميع أصحاب الشأن في المدرسة.					
5	تعتبر جميع مصادر التكنولوجيا في المدرسة آمنة ومحمية عند استخدامها من قبل الطلبة.					
6	أعمل على نشر تعليمات صحية عند استخدام التكنولوجيا في المدرسة (مثال: كيفية الجلوس أمام الحاسوب، عدد ساعات استخدام الحاسوب ...)					

من الجدول الآتي اختر أهم ثلاثة تحديات تعتقد أنها تواجه مدراء المدارس في دمج التكنولوجيا في كافة محاور عمل المدرسة:

التحدي	✓
ارتفاع تكاليف دمج التكنولوجيا ونقص التمويل والدعم المالي.	
قلة إلمام مدير المدرسة بالتكنولوجيا.	
قلة إلمام الموظفين بالتكنولوجيا.	
ضعف مهارات المعلمين في دمج التكنولوجيا.	
مقاومة الموظفين لدمج التكنولوجيا.	
التجدد المستمر لأدوات التكنولوجيا وضرورة المواكبة.	
قلة برامج التنمية المهنية في استخدام التكنولوجيا.	
أخرى، أذكرها:	

شكراً جزيلاً لمشاركته

**APPENDIX F**

Teachers Cover Letter

السيدة/ عضو هيئة التدريس ..... المحترم/ة

تحية طيبة وبعد،

هذه الاستبانة جزء من دراسة للحصول على درجة الماجستير في كلية التربية في جامعة الإمارات العربية المتحدة. وتهدف الرسالة إلى تحديد مدى دمج التكنولوجيا في التعليم من قبل مدرّاء مدارس مدينة الشارقة في مدارسهم من وجهة نظر المدرّاء والمعلمين وفق المعايير العالمية.

إجابتك على بنود الاستبانة وإعادتها يعتبر موافقة ضمنية من قبلك للمشاركة في هذه الدراسة. علماً بأن المشاركة تطوعية ولن يطلب منكم ذكر أسمائكم أو أسماء مدارسكم وسيتم التعامل مع استجاباتكم بسرية تامة ولن يتم استخدامها إلا لأغراض الدراسة فقط. يرجى التكرم بالإجابة على كافة بنود الاستبانة بعناية ودقة وموضوعية وحرص على عدم مناقشتها مع الزملاء إلا بعد الانتهاء منها. ويتوقع أن تستغرق الإجابة عليها فقط (5 – 10) دقائق بحد أقصى.

لمزيد من المعلومات أو الاستفسار يرجى التواصل مع الباحث على البريد الإلكتروني [201180810@uaeu.ac.ae](mailto:201180810@uaeu.ac.ae)

شاكرا لكم حسن تعاونكم ومشاركاتكم بالاستجابة للاستبانة.

وتفضلوا بقبول فائق التقدير والاحترام.

الباحث

سامر الصالح



**APPENDIX J**

Teachers' Survey

### استبانة أعضاء الهيئة التدريسية Faculty Members Survey

<input type="checkbox"/> Male ذكر		<input type="checkbox"/> Female أنثى		الجنس
<input type="checkbox"/> Bachelor بكالوريوس		<input type="checkbox"/> Master ماجستير		<input type="checkbox"/> PHD دكتوراه
<input type="checkbox"/> Less than 5		<input type="checkbox"/> 5-10		<input type="checkbox"/> 10-15
				<input type="checkbox"/> More than 15
معلومات المدرسة				
<input type="checkbox"/> Public حكومي		<input type="checkbox"/> Private خاص		نوع التعليم
<input type="checkbox"/> 1-5		<input type="checkbox"/> 6-9		<input type="checkbox"/> 10-12
<input type="checkbox"/> Girls بنات		<input type="checkbox"/> Boys بنين		الحلقة

#### تعريفات:

التكنولوجيا: تشير إلى أجهزة الحاسوب الشخصية، وأجهزة الشبكات وأجهزة الحوسبة الأخرى (على سبيل المثال، ألواح الكتابة الإلكترونية والمساعات الرقمية الشخصية (PDAs))، وتشمل البرمجيات، والوسائط الرقمية، وأدوات الاتصال مثل الإنترنت والبريد الإلكتروني، والأقراص المدمجة، والمؤتمرات المنفذة عن طريق الفيديو وتطبيقات الموبايل.

في الصفحات الآتية اختر من المقياس التالي ما تراه يمثل وجود وتحقق البنود أدناه في واقع مدرستك الحقيقي

وليس ما تظن أو تقتنع بأنه الصواب:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
أبداً	نادراً	أحياناً	كثيراً	دائماً

1	2	3	4	5
أبداً	نادراً	أحياناً	كثيراً	دائماً

### أولاً: قيادة ذات رؤية

#	البند	1	2	3	4	5
1	لدى مدرستي رؤية (Vision) واضحة لتحقيق الدمج الشامل للتكنولوجيا وذلك من أجل دعم الممارسة المهنية الفاعلة.					
2	يقوم مدير المدرسة بنشر رؤية لاستخدام التكنولوجيا وإشهارها بين جميع المعنيين في المدرسة ويوضح التوقعات من استخدام التكنولوجيا.					
3	يقوم مدير المدرسة بتنفيذ خطة استراتيجية للتكنولوجيا تحقق رؤية دمج التكنولوجيا.					
4	أشارك في عملية التخطيط لاستخدام التكنولوجيا* في مدرستي.					
5	يوجد في المدرسة سياسات وبرامج تدعم ممارسات دمج التكنولوجيا وخصوصاً الممارسات المستندة إلى البحث العلمي.					

### ثانياً: ثقافة التعلم في العصر الرقمي

#	البند	1	2	3	4	5
1	يحث المدير المعلمين على استخدام التكنولوجيا لتحسين التدريس.					
2	يحث المدير المعلمين على الاستخدام المتكرر والفاعل للتكنولوجيا في التعلم من أجل تنمية مهارات التفكير العليا وحل المشكلات لدى الطلبة.					
3	يكافئ المدير المعلمين الذين يستخدمون التكنولوجيا في تدريسهم بطريقة إبداعية.					
4	يوجه المدير المعلمين إلى استخدام التكنولوجيا لتحليل وتفسير بيانات الطلبة لتحسين ممارسات التدريس.					
5	بيئة التعلم مجهزة بكافة مصادر التقنية المختلفة وذلك من أجل تلبية احتياجات تنوع التعليم وتفريده.					
6	يعتبر المدير قنوة للمعلمين في تقديم أفضل ممارسات التدريس باستخدام التكنولوجيا.					
7	استخدم التكنولوجيا في جميع أعمال التدريس وغير التدريس.					
8	توفر المدرسة تطويراً مهنيّاً ذو جودة عالية لدعم دمج التكنولوجيا في تحسين تعلم الطلبة.					
9	يوفر المدير الوقت والدعم المادي للمعلمين الراغبين في حضور فعاليات خاصة باستخدام التكنولوجيا في التدريس.					

\*التخطيط لاستخدام التكنولوجيا. أي عملية تعتمد على مجموعة أصحاب القرار المختلفة (على سبيل المثال: المنطقة التعليمية، إدارة المدرسة، أعضاء هيئة التدريس، وأولياء الأمور) لتطوير استراتيجية خاصة باستخدام التكنولوجيا في التعليم والعمليات، أو التوسع باستخدامها.

1	2	3	4	5
أبداً	نادراً	أحياناً	كثيراً	دائماً

### ثالثاً: التميز في الممارسة المهنية

#	البند	1	2	3	4	5
1	يعتبر مدير المدرسة مثلاً يحتذى به في استخدام التكنولوجيا في كل أعماله.					
2	يتواصل المدير مع المعلمين والموظفين وأولياء الأمور والمجتمع باستخدام أدوات التكنولوجيا.					
3	يستخدم المدير التكنولوجيا في تحسين وتطوير ودعم عمليات المدرسة ( مثال: حفظ الملفات، إدارة الميزانيات، تنظيم معلومات الطلبة، بناء جداول الحصص، ...)					
4	تواكب إدارة المدرسة المنتجات التكنولوجية الحديثة التي يمكن أن تستخدم في التعليم.					
5	يشجع المدير الموظفين على استخدام التكنولوجيا لتحسين إنتاجيتهم.					
6	يوظف المدير نتائج التقييم الخاصة باستخدام التكنولوجيا في التطوير المهني واتخاذ القرارات.					
7	يقدر المدير المبادرات التي يقدمها المعلمون والعاملون والتي يتم فيها استخدام التكنولوجيا.					

### رابعاً: التحسين الشامل

#	البند	1	2	3	4	5
1	يوفر المدير دعماً كافياً لتسهيل استخدام التكنولوجيا في العمليات المختلفة ( مثال: رصد الغياب، رصد درجات الطلاب، ..)					
2	يعزز المدير الموظفين للتعامل مع المشكلات التقنية المتكررة عند استخدام الحاسوب.					
3	يوفر المدير ميزانية مالية مناسبة لتسهيل استخدام أدوات التكنولوجيا ومصادر ها.					
4	يتوفر في المدرسة كوادر بشرية مختصة لتسهيل استخدام ودمج التكنولوجيا في المدرسة ( مثل: فني دعم وصيانة الشبكات والتقنيات أو منسق التكنولوجيا )					
5	توجد سياسة واضحة في مدرستي لشراء، صيانة، تحديث، أو استبدال أدوات التكنولوجيا على أساس مستمر.					
6	تحرص إدارة المدرسة على ترقية الأجهزة والبرمجيات لتحسين القيام بالعمليات المختلفة في المدرسة.					
7	يوجه مدير المدرسة المعلمين والعاملين نحو استخدام التكنولوجيا لتحليل البيانات وتفسير ونشر نتائج عمليات المدرسة.					

1	2	3	4	5
أبداً	نادرًا	أحيانًا	كثيرًا	دائمًا

#### خامساً: المواطنة الرقمية

#	البيد	1	2	3	4	5
1	توجد في المدرسة فرصاً متساوية لجميع الطلبة للوصول لمصادر التكنولوجيا (مثال: جهاز حاسوب لكل طالب في المختبر ، أجهزة لنوي الاحتياجات.. إلخ).					
2	توجد مصادر للتكنولوجيا ملائمة لاحتياجات جميع الطلاب على اختلاف مستوياتهم.					
3	يوجد في مدرستي سياسات وتعليمات للاستخدام الآمن والقانوني والأخلاقي لمصادر التكنولوجيا وأدواتها.					
4	يحرص مدير المدرسة على نشر مفهوم حقوق الملكية الفكرية لجميع منتجات التكنولوجيا بين جميع أصحاب الشأن في المدرسة.					
5	تحتبر جميع مصادر التكنولوجيا في المدرسة آمنة ومحمية عند استخدامها من قبل الطلبة.					
6	يتوفر في المدرسة تعليمات صحية منشورة لاستخدام التكنولوجيا في المدرسة ( مثال: كيفية الجلوس أمام الحاسوب ، عدد ساعات استخدام الحاسوب ... )					