EVALUATION OF CADER ICT PROGRAMME AND CADER ICT SUPPORT SYSTEM MANAGEMENT ON TEACHERS ICT PROFICIENCY

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by

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DEDICATION

I would like to dedicate this research project to my late parents. There is no doubt in my mind that their motivational inspirational words were what always gave me the strength, courage and zeal to carry on at USM.

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LIST OF ABBREVIATION

DLE	Distributed Learning Environment
CADER	Change Agent for Arab Development and Education Reform
SSS	Student's Support System
ICT	Information and Communication Technology
CMEAC	Connecting Middle East Advisors and Consultants
MOE	Ministry of Education
HED	Higher Education Diploma
ELE	Electronic Learning Environment
ERfKE	Knowledge Economy
JSP	Jordan Schools project
LMS	Learning management system
ESP	ErfKE support project
PTAs	Parents and teachers Association
S-R-S	Stimuli and Response Theory
PSI	Personalized systems of instruction
ICDL	International Computer Driving License
iEARN	International Education and Resource Network
PNC on ISAD	Presidential National Commission on Information Society and Development
SMMEs	Small, Micro and Medium Enterprises
SARS	South African Revenue Service's

PENILAIAN PROGRAM TMK CADER DAN CADER SISTEM SOKONGAN PENGURUSAN TMK CADER TERHADAP KECEKAPAN TMK GURU

ABSTRAK

Kajian ini menilai program TMK CADER dan sokongan sistem TMK CADER terhadap sistem pengurusan terhadap penguasaan TMK guru. Penyelidik mengkaji kandungan program TMK CADER sistem sokongan TMK dan kemahiran ICT guru-guru sains 'yang dikehendaki oleh Kementerian Pelajaran. Perbincangan dalam kajian ini adalah berdasarkan kepada rangka kerja teori modal sosial, teori modal manusia dan model Dunn. Teori-teori dan model ini amat sesuai untuk kajian ini kerana dapat memberi kefahaman kepada para pembaca berkenaan program TMK CADER dan sokongan sistem pengurusan TMK CADER terhadap penguasaan profisiensi TMK ICT guru untuk dinilai. Seramai 15 orang responden telah terlibat dalam kajian kualitatif yang terdiri daripada pengurus dan jurulatih dari CADER, pengurus dan penyelia daripada Kementerian Pelajaran Jordan. Bagi kajian kuantitatif, seramai 254 responden telah digunakan. Mereka terdiri daripada guru-guru sains di sekolah-sekolah menengah yang mempunyai diploma dan juga datang daripada empat buah negeri di Jordan seperti Amman, AL-Zarqa, Al Balqa dan Madaba. Analisis Thermatic digunakan untuk menganalisis data kualitatif bagi menyiasat kandungan program TMK CADER, sistem sokongan TMK CADER dan kemahiran TMK guru-guru sains seperti yang dikehendaki oleh Kementerian Pelajaran. Hasil dapatan kualitatif telah digunakan untuk membangunkan instrumen kajian kuantitatif selepas proses pengesahan oleh pakar-pakar dan analisis faktor SPSS versi 21 telah digunakan untuk menganalisis kajian data kuantitatif. Statistik deskriptif keputusan memberikan ringkasan status semasa program TMK CADER,

kemahiran TMK guru-guru sains dan sistem sokongan ICT CADER. Sampel bebas ujian-T dan ANOVA sehala telah digunakan untuk memeriksa sama ada terdapat perbezaan pendapat yang signifikan mengenai program TMK ICT CADER, kemahiran ICT guru-guru sains, sistem sokongan TMK CADER, berdasarkan pengalaman mengajar dan jantina. Keputusan sampel bebas ujian-T menunjukkan bahawa terdapat perbezaan yang signifikan dalam pendapat mengenai program TMK CADER, antara jantina, tetapi tidak ada perbezaan pendapat yang signifikan mengenai kemahiran TMK ICT guru-guru sains antara jantina. Walau bagaimanapun, hasilnya juga menunjukkan bahawa terdapat perbezaan pendapat yang signifikan mengenai kemahiran ICT guru-guru sains antara jantina. Begitu juga hasil daripada analisis regresi menunjukkan pengaruh pada tahap yang sederhana bagi program TMK CADER, penguasaan ICT guru-guru sains dan dalam sistem sokongan pengurusan TMK CADER. Terdapat pengaruh yang kuat bagi program TMK CADER terhadap guru-guru sains dalam penguasaan TMK ICT tetapi tidak ada pengaruh penting sistem sokongan TMK CADER kepada guru-guru sains penguasaan ICT dan tiada juga pengaruh penting daripada program TMK CADER dan sistem sokongan TMK ICT CADER. Akhirnya, hasil daripada analisis regresi berganda menunjukkan bahawa sistem sokongan pengurusan TMK CADER bertindak sebagai moderator kepada hubungan antara program TMK CADER dan kemahiran ICT guru-guru sains. Oleh itu, hasil kajian penyelidikan ini menunjukkan ringkasan status semasa program TMK CADER, penguasaan TMK ICT CADER guru-guru sains, sistem sokongan TMK dan juga menyediakan satu langkah untuk menjangkakan hubungan antara program TMK CADER dan sains guru kemahiran TMK dan kerajaan Jordan melalui sistem perundangan dan sistem pendidikan. Ini bagi meningkatkan kualiti program TMK CADER, secara tidak langsung pengamal

pendidikan akan mempunyai kefahaman baik untuk meningkatkan kemahiran guru-guru sains mereka melalui latihan yang berkualiti.

EVALUATION OF CADER ICT PROGRAMME AND CADER ICT SUPPORT SYSTEM MANAGEMENT ON TEACHERS ICT PROFICIENCY

ABSTRACT

This research evaluated the CADER ICT programme and CADER ICT support system management on teachers ICT proficiency. The researcher investigates the content of CADER ICT programme , CADER ICT support system and science teachers' ICT proficiency required by the Ministry of Education. The discussion in the study is based on the theoretical framework of social capital theory, human capital theory and the Dunn's model. These theories and model are appropriate for the study because they allowed the reader to understand how CADER ICT programme and CADER ICT support system management on teachers ICT proficiency were evaluated. A total of 15 respondents were involved in the qualitative study comprised of managers and trainers from CADER and managers and supervisors from Jordan Ministry of Education. For the quantitative study 254 respondents were used, these comprised of science teachers in secondary schools who had diploma and also come from four state of the middle region of Jordan which include Amman, AL-Zarqa, Al-Balqa and Madaba. Thematic analysis was used to analyze the qualitative data which investigate the content of CADER ICT programme , CADER ICT support system and science teachers' ICT proficiency required by the Ministry of Education. The findings of the qualitative approach were used to develop the quantitative research instrument after validation process by the experts and factor analysis. SPSS version 21 was used to analyze quantitatve data of the study. The descriptive statistics results gave summary of the current status of CADER ICT programme , science teachers' ICT proficiency and CADER ICT

support system. Independent sample T-test and one way ANOVA were used to examine whether there is significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system, based on teaching experience and gender. The results of independent sample T-test showed that there is a significant difference in opinion on CADER ICT programme , between gender, but there is no significant difference in opinion on science teachers' ICT proficiency between gender. However, the result also shows that there is a significant difference in opinion on science teachers' ICT proficiency, between gender. Similarly result from regression showed the moderates significant influences of CADER ICT programme on science teachers' ICT proficiency, CADER ICT support system on science teachers' ICT proficiency and CADER ICT programme on CADER ICT support system. There is significant influence of CADER ICT programme on science teachers' ICT proficiency but there is no significant influence of CADER ICT support system on science teachers' ICT proficiency and no significant influence of CADER ICT programme and CADER ICT support system. Finally, results from the multiple regression analysis revealed that CADER ICT support system act as a moderator on the relationship between CADER ICT programme and science teachers' ICT proficiency. Since the results of this research study gave summary of the current status of CADER ICT programme , science teachers' ICT proficiency and CADER ICT support system and also provide a means to predict the relationship between CADER ICT programme and science teachers' ICT proficiency, Jordan government through legislators and school system personnel can use the result of the study improve the status of CADER ICT programme in order to prioritize the allocation of resources and focus on intervention efforts. Additionally, education specialists, practitioners, and school system personnel will

have a better understanding of the type of training to be given to science teachers in order to improve their proficiency.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter provides a discussion of the background to the study that include a history of the educational system in Jordan as well as the current education system in Jordan, the status of teaching science and mathematics in Jordan, the profile of Change Agent for Arab Develpoment and Education (CADER) programme in Jordan and ICT training offered by CADER. The chapter also includes problem statement, research objectives, research questions, research hypotheses, rationale of the study, significance of the study, scope and limitations of the study, operational definitions, framework of the study and summary.

1.1 Background of the Study

Traditionally, Jordan society has been a regional leader in adopting and utilising information and communications technology (ICT) by introducing CADER and other related ICT programme in the country a long time ago. However, in recent decades, Jordan's lead has decreased over regional economies due to certain economic problems. In order to reduce and eliminate its dependency on external donor or funding, it is important for Jordan to develop independent sources of economic competitiveness since Jordan's economic activities have historically been based on international donors organisations. In the case of Jordan particularly, this can only be achieved with the talent, creativity, education and skills of its citizens Jordan could be provided with plan

strategy and techniques for addressing areas of weakness. Moreover, the primary objective of this strategy is to provide an opportunity for the purpose of improving the contribution of ICT to Jordan's economic development and job creation (MOICT, 2014).

CADER was registered in Jordan in September 2004. It is the coronation effort of a joint Arab-European study of the requirements for education reform and development in the Arab World. CADER offers professional development Programme based on integrating Information and Communication Technology (ICT) to promote the processes of teaching, learning and working (CADER, 2009).

1.2 Jordan's Government Effort in ICT Carder

The approach attempts to collaborate with the Government policy in Jordan Telecommunications and IT Sectors in all its recommendations. A powerful paradigm for economic development was provided by ICT that has evolved into an internationally known language and standard programmes. It is one of the advantages of ICT that now the days of ICT professional in Jordan can be improved to develop products and services that can be implemented in and have value in global markets for consumers. It is this golden opportunity that is afforded by ICT that makes it imperative for Jordan to take advantage of this opportunity (Al-Jayyousia et, al., 2013; MOICT, 2014). Being able to take full advantage of this opportunity requires the business environment to be competitive with the world international economies. It is only through this process that structural impediments can be removed by allowing Jordan's ability to compete globally with the rest of the developed countries on the abilities of its citizens in the

field of ICT. Moreover, it is necessary for ICT infrastructure and support system to be continually maintained at the levels found in competing economies due to global rapid development in the aspect of technology. Foundation provides a platform for new product innovation and service organisational development and genius.

The ICT industry will be handicapped without infrastructure at any level both of local and international standards. Many ICT companies may be developing products and services based on an obsolete infrastructure that are not applicable outside Jordan. This is an avoidable tragedy as exports are required to mitigate Jordan's chronic trade deficit. Attempts have been made to provide simple and practical recommendations to improve the export sector resources and increase the industry's contribution to the economy of the nation. Moreover, also to create and provide job opportunities to its citizens (Al-Jayyousia et al., 2013; Jordan National ICT Strategy 2013–2017, 2013).

Since the Government of Jordan (GOJ) suffers from a chronic budget deficit in its economy, it is imperative to overcome and solve the problem of the government's inability to finance infrastructure development. There is a need for the Government of Jordan (GOJ) to develop modalities in private sector investment that can be engaged to continually upgrade ICT infrastructure in the country. This will require the development of Public Private Partnerships (PPPs) or other partnership models to be identified to promoted and upgrade infrastructural facilities (MOICT, 2014).

As a knowledge-based industry, ICT and other aspects such as training and education with certification play a great role in determining sustainable competitiveness and longevity. Jordan, like other countries of the world, is already well known for its

university system, however, the university system is not sufficient to meet the relevant demands of the ICT sector. The Psector of ICT needs to develop in a manner that ICT graduates can continually train and develop their skills to be used in relevant local ICT companies and to develop competitive products in line with modern technology. Under CADER Programme, training and certification inside and outside the universities could be conducted with independent professional development bodies, institutes or existing training and educational institutions in collaboration with international world class technology providers and international operators (Jordan National ICT Strategy, 2013).

Finally, in this strategy, the issue of CADER ICT Programme has been covered as a requirement for economic growth of Jordan and other developing countries. The approach explicitly explains and calls for developing intersections between the ICT sector, education sector and other competitive industrial sectors such as architecture and engineering, pharmaceuticals and clean technology to identify issues that can be adequately addressed to improve the competitiveness of the individuals in ICT sector in order to facilitate science teachers in terms of ICT proficiency. This will be facilitated because developed ICT products and services would be useful to the sectors in CADER programme taking place in Jordan, particularly at the Ministry of Education (Jordan National ICT Strategy 2013 – 2017, 2013).

In the last decades, the Jordanian government recognised the Information and Communication Technology (ICT) as an increasingly significant factor contributing to innovation, education, economic growth and increased productivity. The government also acknowledges that the ICT labour market for workers is changing, which illustrates

the imbalance in the demand and supply for skilled professionals. In terms of employment in ICT, it is expected to grow strongly at about three per cent per year. With increasing pressure to find suitably qualified ICT staff to deliver the government's priorities effectively especially in the educational sector (MOICT, 2014).

1.2.1 The Jordan’s goveemwent ICT Programme

The main ICT projects such as the National Broadband Network system and WI-FI in Jordan were established to generate substantial future demand and competition for the qualified staff. The whole government strategic ICT programme Workforce Plan is underpinned by an ICT Capability designed Framework, which is built on an internationally recognised ICT capacity model and the Skills Framework for the Information Age (SFIA). This ability framework also served as a tool that forms an essential component of the whole of government ICT Career Structure, which is another key deliverable from the ICT Reform Programme. An anchor point for people management processes within agencies and for the career planning of ICT professionals is represented by this framework. The whole government strategic ICT Workforce Plan and Capability Framework is instructed to use the information in it and continue to improve the approaches to the recruitment, training, retention and engagement of ICT professionals development within the Jordanian Public Service (MOICT, 2014).

REACH (1999-2005) in Jordan's blueprint for National Straegy is nurturing a vibrant, export-oriented, internationally competitive ICT sector. The strategy focused its attention on developing a positive regulatory framework that will provide an enabled infrastructural environment, offering advancement programme to the industry, availing

capital and finance, and carrying out human resources development initiatives. The REACH initiative's includes extension in Information Communication Association (ICA) leading enterprise. The National ICT Strategy (NIS), was created to support the government's proactive efforts to improve its citizens' living standards through the National Agenda. The reformed strategy (2007-2011) and the revised version (2013-2017) headed by ICA make up a number of revised policies and directions aimed at taking advantage of new markets by enhancing business maturity, investing in research and development, capitalising on regional demand, cultivating foreign investments, and improving the ICT labour market.

The techniques attempt to be aligned with the government's policy in the Telecommunications and IT sectors in terms of its requirement and recommendations. As with REACH, the NIS will continue to focus significantly on removing regulatory challenges by advocating and on behalf of the private company, to maintain a legislative environment that fosters growth and development in IT advancement programme .

ICT can provide a powerful paradigm for resourceful and economic development. ICT has evolved recognition into an internationally acknowledged language/standard. A knowledgeable and competent ICT professional in Jordan can develop products and provide services that can be implemented in the country and have value in global markets. This is an opportunity afforded by ICT, which makes it imperative for Jordan's technological development to take advantage of this opportunity. Being able to bring many benefits of this opportunity requires a conducive business environment that will allow it to compete with international economies. It is

only in this aspect that structural impediments can be removed allowing Jordan's ability to compete with the rest of the world (REACH, 2000; MOICT, 2014).

1.2.2 View on Teacher ICT CADRE

A number of researchers asserted that there is a need for a comprehensive strategic reform, which considers different dimensions of an effective reform. It is also significant that comprehensive strategic reform of an educational system assists in enhancing the quality, relevance, standards, accessibility and efficiency. A considerable number of global initiatives in Middle Eastern countries and some constructive programme engineered by the United Nations have been considered to help Arab states to modernise their current educational systems (Samak & Tawfik, 2006). In order to satisfy the needs and demands of current changes in the education system and development communal challenges, this new trend of modern education systems was taken into account as warranted. In addition, till the year 1963 there was an ineffective educational system in Jordan (Jordan National Education Strategy, 206; Brennan, 2008). Having observed the ineffectiveness of this system and education's critical contribution to economic development, the Jordanian authorities advanced an institutionalized-based education system. The goal of adopting the late 1980s national educational policy, known as FOE, was to update the current teaching methods. To actualised this initiative, several measures have been introduced. For example, CADER ICT, a programme highly admired by the academic community in Jordan (MOE, 2011).

CADER's ICT training initiatives aim at promoting career enhancement and human resource development programme that can cater to the needs of different local

communities. The ICT programme have been perfectly designed to meet the purposes of various clients such as teachers, learning institutions and the Ministry of Education. In 2004, a diploma programme was initiated to promote the ICT application in the field of education in Jordan. The rationale behind the development of the ICT Diploma curriculum is to promote skills with regards to problem solving, project management, communication, leadership and development of competencies along with the development of the needed ICT skills and knowledge (CADER, 2011).

The CADER's training programme are also relevant to operationalise the vision of the Ministry of Education (from now on, MOE) of Jordan. MOE asserts that quality and excellence in teacher training would assist teachers and help them to learn the latest techniques in ICT. It would also provide support to the government to continuously focus its efforts in promoting growth in the education sector. Moreover, it builds a stable, flexible and conducive learning environment. Furthermore, the concept of e-government would also be practical if the teachers are well prepared. Therefore, CADER's training programme are vital for the government and the MOE alike (CADER, 2011; Jordan National Education Strategy, 2006).

The purpose of professional training programme in ICT is to advance and improve the skills of teachers and to incorporate professional standards with ICT in different specialisations. MOE in the Hashemite Kingdom of Jordan is responsible for formulating plans and strategies, implementation, assessment and policies in all aspects of public education. Therefore, CADER's training programme are designed to ensure the application of the vision of His Majesty, King Abdullah II, which is relevant to

Hashemite Kingdom of Jordan's overall growth and development (Jordan National Education Strategy, 2006) .

The policymakers must be concerned with five key challenges when making decisions on the integration of ICTs in the educational system, namely educational policy and planning, infrastructure, building availability, and financing. Secondly, the role of policy makers is to address the four broad issues in ICT on education effectiveness, cost, equity, and sustainability (MOE, 2009).

The efficient and successful ICT practice of a country relies on productive policies and its implementation. However, the experience of introducing various ICT training in the classroom suggests that the full realisation of the potential benefit of education in ICT is not automatic. The effective integration of ICT into the educational system is a complex, multifaceted process that involves not just technology. Indeed, given enough initial capital, getting the technology is the easy part but the more complex aspects also include curriculum and pedagogy, institutional preparedness, teacher competencies, and long-term financing (National Teachers Professional Standards, 2006).

Recently, MOE in the Hashemite Kingdom of Jordan is giving attention to the growth of the quality of primary and all stages of education which can be associated with the world educational objective of the 21st century (MOE, 2010). As such, teacher's education and training are offered based on the newly developed national education strategy. The policy was carried out through two phases: the first phase was during the rule of King Hussein (1989-1995). The goal of this phase was to improve

teachers' training, develop new curriculum, reform the educational system and vocational training. Instructional techniques and aids, public school examinations, school buildings and the later stage of the plan (1996-2000) were deployed after the succession of King Abdullah II to his father. This phase gave emphasis on restructuring educational materials in the fields of teachers' assessment and growth, educational and academic-based innovations, vocational and technical training, pre-school education, and informal education (MOE, 2011). Respectively, the Ministry of Education in the Hashemite Kingdom of Jordan has realised that the academic staff and faculty members are the key factors in the educational development. Thus, this has led to more emphasis on the expansion of the quality of teacher training programme to obtain its intended objectives by improving teachers' performance and quality (MOE, 2010).

Teachers need training not only in basic computer literacy but all computer applications of different kinds of educational software in learning and also teaching CADER ICT support system to run the programme successfully. Furthermore, they need to acquire skill and learn how to integrate ICT programme into classroom and school activities in general. The quality of qualified teachers is known, in Jordan and other countries, to be a key predictor of student learning and support system. Therefore, teacher training is crucial. CADER ICT support system becomes a tool that facilitates teacher training and helps them to take advantage of technology to enhance student learning (UNESCO, 2014).

The quality of teachers' training is one of the most important priorities of the strategic reforms that relates to the educational system in Jordan as well as in the

development of Information and Communication Technology (ICT) knowledge. Both the quality and excellence of teacher training helped teachers to learn the updated techniques and build stable and flexible learning environments. Classroom management where teachers are supported with the required demands to develop their teaching and learning skills so that they can deal with various situations (MOE, 2009).

As teachers' knowledge and beliefs highly affect classroom practices, developing and changing them should be an essential element in any educational restructure. Varied types of programme such as CADER that are relevant to training teachers have been discussed in the past literature. Some researchers have given attention to in-service training to assist and train academic staff (MOE, 2010).

1.3 The Status of Teaching Science and Mathematics in Jordan

Developing an appropriate vision of the nature of science and mathematics have grown to be the primary objectives of teaching science and mathematics for both teachers and learners in Jordan despite the newly updated pedagogical focus. As a result, it has developed as an area of prolific research known for several parallel, but unique, areas of research and academic investigations. The overall objective of teaching science and mathematics in the Hashemite Kingdom of Jordan is to enhance teachers' and learners' ability to clarify what has been learned. Moreover, it is also aimed to elucidate the necessary investigations and logic, which have guided earlier research efforts so that the country can gear up with the aspects of developed countries in the world.

Thus, science and mathematics are taught in Jordan at all levels that include postsecondary and higher education sectors in both schools, colleges, and universities as an academic subject (Zughoul & Abdul-Fattah, 2001). Learners have many difficulties in learning science and mathematics. These difficulties may be ascribed to several reasons, including teaching materials, methods, curriculum, tests and examinations, and use of ICT (Ministry of Higher Education & Scientific Research, 2008).

The Education Ministry is responsible for shaping the objectives of teaching science and mathematics at lower educational levels while the Higher Education Ministry is responsible for the teaching of science at higher education levels (Zughoul, 2001). The science and mathematics materials designed by the two ministries aim at acquainting learners and teachers with the latest scientific research, development and facts about human life and the world. Zughoul and Abdul Fattah (2003) state that by the end of their lower and higher education, learners are expected to conduct and carry out scientific and mathematical experiments to achieve and produce favourable results. A number of objectives of teaching science and mathematics at both lower and higher education stages (schools, colleges and universities) have been identified by the Education Ministry (Al-Fageeh, 2003). The objectives of teaching science and mathematics in Jordan are:

i) By teaching science and mathematics at lower and higher education stages in Jordan, science and mathematics learners and students are expected to conduct and carry out successful scientific and mathematical experiments that would help in the national growth of Jordan.

ii) By the end of their science and mathematics programme , learners and students must convert the theoretical knowledge into practice in the form of inventions and innovations.

iii) The science and mathematics whether at the lower or higher education stage is the central aim of the Jordanian universities, colleges, schools, and institutes because science and mathematics are important in all aspects of life especially medicine and health science.

For these reasons, science and mathematics have always been an essential aspect of the educational curriculum in Jordan. The government of Jordan provides all the assistance in the teaching of science and mathematics so that the country can cope with the contemporary changes. Moreover, development of science and mathematics is crucial in most of the scientific inventions and innovations, trade, and economic and social developments (Ministry of Higher Education & Scientific Research, 2011).

1.3.1 Profile of CADER Programme in Jordan

The term CADER refers to the Change Agent for Arab Development and Education Reform. CADER was founded in Jordan in 2004. It is an extensively developing company in the area of training and development. It is located in the Hashemite Kingdom of Jordan. Also, it provides different training and professional programme not only in Jordan but also in the whole region. It is the outcome of the joint Arab-European evaluation and investigation of the educational and developmental reforms needed in the Arab World (CADER, 2011).

It provides a variety of developmental and professional programme supported by the incorporation of Information and Communication Technology (ICT) for the development process of teaching and learning in the workplace. The broad objective of CADER is to provide consulting services that would help in giving educational and academic reforms and development (CADER, 2012).

The philosophy of CADER is to offer a high-quality education in the essential element in enhancing the manpower in the Arab World in general and Jordan, in particular. It is a form that distinguishes partnership between sectors of business and education in which each one of them is specialised and professional in its area. This comprises three outstanding public universities are: TU Delft (Technological University Delft) which is located in the Netherlands; the INHoland University, which is also from the Netherlands and Yarmouk University which is based in the Hashemite Kingdom of Jordan as well as the Advanced Systems Co. Ltd which is founded in the Kingdom of Saudi Arabia and other consultant agencies in the Netherlands (CADER, 2011).

CADER also sees a change as not only include in manpower, but it must also include technological changes. It provides both current knowledge and techniques of ICT to people so that they can update themselves. Moreover, it gives people the new method to enhance their skills, ability and the gained new knowledge to incorporate it into their daily work practices as a process of development. Thus, the notion of CADER is based on the fact that achieving professional progress is based on changing the attitudes and work behaviour of individuals at the workplace. This requires an entire modification of the management approach that is associated with uplifting awareness,

responsibility, learning by doing, accountability, firms and constructions ownership and professional commitment (CADER, 2012).

1.3.2 ICT Training Offered by CADER

The success of CADER in the Jordanian region is the outcome of the variety of programme that were offered by CADER which includes both academic and training programme . The academic programme that CADER provides includes a High Diploma (ICT) in Education. The emphasis of the Diploma Certificate is on the methods and techniques of teaching and learning through the successful use of ICT techniques in enhancing the teaching-learning process. The certificate is offered in collaboration with the earlier mentioned universities and academic institutions in the previous section. While, the training part provides a varied type of training programme that relate to professional and developmental programme associated with teachers' professionalism and leadership (CADER, 2012).

Generally, the goal of academic and training programme is to promote teachers' knowledge and skills that enable them to participate in the programme of both academic and educational leaderships which are related to Electronic leaders (E-leaders) at their workplaces. The logic behind these academic and training programme is to develop professional and skilled teachers (E-leaders) at schools in the first instance and finding a nucleus for communal work in the second area (CADER, 2011).

Although the basic role of these academic and training programme is to support teachers with appropriate guidance in order to incorporate ICT in their teaching-learning

process at the workplace. By the end of these programme , teachers would be able to lead developmental and professional teams, take responsibility to conduct academic research with the goal of assessing teachers with technological aids and practices that support their developmental and professional mission. This also provides teachers the opportunity to explore and use new ideas and thoughts. Furthermore, it also offers group teaching and learning, gives new teaching methods, helps learners and teachers overcome the obstacles that always prevent the adoption and use of technology in the teaching-learning process (CADER, 2012).

1.4 The Problem Statement

Students' performance, particularly in mathematics and science subjects in the Jordanian secondary schools has been observed to be very low. The average science score is low, and all the graders performed less than the average marks of Trends in International Mathematics and Science Study (TIMSS) in 2011. This is related to mathematics and science teachers' lack of proficiency in using the appropriate teaching methods. This means that, teachers' proficiency plays a crucial role in the progress and failure of the students (TIMSS, 2011). Consequently, providing teachers with a new teaching approach or method through using ICT is believed to help teachers to improve their teaching proficiency. This is confirmed by studies conducted in a Jordanian context amongst 8th-grade students (Hammouri, 2010).

Educators and scholars are also inclined to look at factors that influence students' performance in mathematics and science subjects consequently. By enhancing teachers' proficiency and performance through designing and incorporating effective

teaching method, it will improve the students' performance (Hammouri et al., 2008; Guskey, 2002). The existing teachers' qualification programme is not achieving constructive outputs (Al Rubaie, 2010) and this indicates that there is a significant need for productive educational programme to develop teachers' performance in teaching science such as those offered by CADER in Jordan.

Al Wreikat and Kabilan (2010) found that the significant teaching problems that teachers in Jordan complain about are those related to the proficiency in using some ICT programme such as those offered by CADER. This usually happens when conducting teaching in the classroom. Similarly, CADER (2012) claims that teachers at Jordanian secondary schools are not proficient enough when they attempt to produce, use and implement ICT offered by CADER (2011). This shows that Jordanian teachers are not proficient in teaching science they face problems in using and implementing ICT in their education process and other programme such as those offered by CADER in Jordan. Although these teachers understand the significant of ICT in education and are necessary for making the learning process successful, they still find it difficult to use it accurately in teaching science, this is because majority of the teachers do not have adequate knowledge about ICT particularly in this era of information and communication technology.

A substantial number of school principals believe that many teachers do not ~~yet~~ possess~~ed~~ the required ICT knowledge and skills despite the fact that all teachers have received one or two types of training programme (Data Statistics MOE, 2013; Data Statistics MOE, 2012; Altarawneh, 2011). The contribution of CADER ICT support in

relation to ICT should be critically examined, and its failure and success should be addressed appropriately. Researches focussing on managerial support, team dynamics, and the effectiveness of researchers for assessing CADER ICT support system, available infrastructure, training and development should be carried out (CADER, 2011).

In addition, preliminary interviews conducted in August, 2011 with four science teachers at CADER campus in Jordan reveals that science teachers who are teaching science at secondary school level face difficulty in using ICT in their teaching and learning process despite having undergone many basic ICT training courses through CADER ICT programme .

Science teachers in Jordan are highly concerned with the teaching proficiency as they are expected to use and implement ICT in teaching science successfully (CADER, 2011). To achieve these objectives, the Ministry of Education directs all its efforts towards equipping them with the appropriate ICT skills and techniques required for advanced work at a high school level (MOE, 2011; MOE, 2012).

Previous researches have shown that teaching ICT diploma courses for trainee teachers had been frustrating experiences working with large number of students enrolled in such courses. Many trainee teachers who are teachers in the discovery schools perceived such experiences as not rewarding to them because of the lack of proper attention ~~is~~ given to this area and its teachers. This could be the serious problem as to why teachers are not interested in ICT training programme (Alomari, 2009) while on the other hand, some officials rely on reports that portray patches of success within educational initiatives. It is important to motivate teachers to undertake training courses

for ICT proficiency and it is also vital to ensure that promotion is not its ultimate goal but the aim is to promote ICT proficiency through CADER programme (Abuhmaid, 2011; Statical Data MOE, 2013).

The aim of this study is therefore intended to provide solution to the CADER programme and CADER support system management in Jordan within the context of this study, in which the primary findings of the study indicate. Despite the importance of ICT in teaching science, the researcher believes that it has not received the attention it deserves in Jordan. This is reflected by few researches on the use of ICT in teaching science at secondary school level (CADER, 2011; Al-Wreikat & Kabilan, 2010; MOE, 2012). However, it is hoped that this study which focuses on the evaluation of CADER ICT programme and CADER support system management on teachers ICT proficiency for the academic year 2013/ 2014 will shed some light on ICT problems that Jordanian secondary school teachers face.

1.5 Research Objectives

The primary goal of this research is to evaluate the influence of CADER ICT programme and CADER ICT support system management on teachers ICT proficiency. The research objectives of this study are as listed below:

1. To investigate the content of CADER ICT programme , CADER ICT support system and science teachers' ICT proficiency required by the Ministry of Education.

2. To develop quantitative research instrument based on the findings of the qualitative investigation.

3. To validate the quantitative research instruments.

4a.To investigate the current status of CADER ICT programme , science teachers' ICT proficiency and CADER ICT support system.

4b.To examine and investigate the significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system based on gender and teaching experience

5a.To examine whether there is any significant influence of CADER ICT programme on science teachers' ICT proficiency.

5b.To examine whether there is any significant influence of CADER ICT support system on science teachers' ICT proficiency.

5c.To investigates whether there is any significant influence of CADER ICT programme on CADER ICT support system.

1.6 Research Questions

In order to achieve the objectives of this research, the research aims at addressing the following research questions:

RQ1. What is the content of CADER ICT programme , CADER ICT support system and science teachers' ICT proficiency required by the Ministry of Education?

RQ2. How can the quantitative research instrument be developed based on the findings of the qualitative investigation?

RQ3. How can the quantitative research instruments be validated?

RQ4a.What is the current status of CADER ICT programme , science teachers' ICT proficiency and CADER ICT support system?

RQ4b. Is there any significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system, based on gender?

RQ4c. Is there any significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system, based on teaching experience and gender?

RQ5a. Is there any significant influence of CADER ICT programme on science teachers' ICT proficiency?

RQ5b. Is there any significant influence of CADER ICT support system on science teachers' ICT proficiency?

RQ5c. Is there any significant influence of CADER ICT programme on CADER ICT support system?

1.7 Research Hypotheses

The current research proposes to test the following hypotheses:

Ho4b. There is no any significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system, based on gender and teaching experience.

Ho5a. There is no any significant influence of CADER ICT programme on science teachers' ICT proficiency.

RQ5b. Is there any significant influence of CADER ICT support system on science teachers' ICT proficiency?

RQ5c. Is there any significant influence of CADER ICT programme on CADER ICT support system?.

1.8 Rationale for the Research

The rationale of this study is to investigate and examine the evaluation of CADER ICT programme and CADER ICT support system management on teachers' ICT proficiency. Investments in CADER ICT programme have increased in the recent years (Pelgrum & Plomp, 2002) with the perception that increased use of computers and

another electronic gadget of media by science teachers could have a positive impact on student achievement (OECD, 2001). In addition, science teachers' use of technology is considered as an important indicator of students' programme to excel at school (Corbett & Willms, 2002) even though the advantage of using ICT for learning and training are still being studied (Wittwer & Senkbeil, 2008).

According to OECD, (2009) CADER ICT programme is the use of any equipment and software for "processing, coding or transmitting digital information and knowledge that performs diverse general functions whose options can be specified or programme med by its user". PISA (2006) conducted research, and collected data from countries that opted to administer a short questionnaire on students' familiarity with ICT, as well as a another set of questionnaire for administrators and Jordan was one of these countries included in this research. Students were asked about their understanding and familiarity with ICT in the ICT questionnaire, in the aspect of adequate and frequency of ICT use and comfort performing programme activities related to ICT.

Administrators were also asked about the number of computers used in their school; of those, numbers of computers connected to the Internet access; and the statistics ratio of computers to students at the school. Students were asked to complete the ICT questionnaire; Jordan was one of the countries which ICT questions related to achievement could be posted. The findings of this research indicate that there are differences in inequality among the countries in relation to the number of computers in their schools. These differences in inequality may have an effect on mathematics and science achievement. In addition, the ways schools resources are used to achieve

academic success based on science teachers' ICT proficiency (Baker & LeTendre, 2005) if a relationship between ICT resources and achievement exists.

Science ICT teachers are trying to ensure the efficient use of ICT does not make them obsolete in the academic world. Science ICT teachers are not at risk of being replaced by computers, but with the advent of CADER ICT and the development of a knowledge-based society, their role needs to be redefined.

Science ICT teachers are no longer dispensers of knowledge and training but rather proactive facilitators and instructors who promote collaborative knowledge-building and guide students to learn in a variety of environments, to navigate within and process a multitude of information resources and to use these resources in solving problems and making decisions on their own.

Jordan Ministry of Higher Education and Ministry of Education have realised this need for redefining science ICT teachers' roles. Moreover, it has manifested to the launching professional development programme to train teachers in the use of computers (Ministry of Higher Education, 2011). However, most of these trainings are crash programme that focus only on computer literacy and do not assist science ICT teachers in day-to-day classroom instruction according to the principles of CADER ICT programme . Learning to use computers and the Internet knowledge is a relatively straightforward task, but mastering ICT use as effective techniques to improve teaching and learning more mainly in CADER ICT programme .

1.9 Significance of the Study

The current study aims to evaluate the CADER ICT programme and CADER ICT support system management on teachers ICT proficiency. This is carried out by investigating the content of CADER ICT programme , CADER ICT support system and science teachers' ICT proficiency required by the Ministry of Education by developing quantitative research instrument based on the findings of the qualitative investigation and validating the quantitative research tools. Furthermore, the study investigates the current status of CADER ICT programme , science teachers' ICT proficiency and CADER ICT support system. The study also investigates the significant difference in opinion on CADER ICT programme , science teachers' ICT proficiency, CADER ICT support system, based on gender and teaching experience. The study also examines whether there is any significant influence of CADER ICT programme on science teachers' ICT proficiency, CADER ICT support system on science teachers' ICT proficiency and CADER ICT programme on CADER ICT support system. The study is concluded by investigating if the CADER ICT support system acts as a moderator on the relationship between CADER ICT programme and science teachers' ICT proficiency.

1.9.1 Significance of the Ministry of Education

The current study aims to evaluate the CADER ICT programme and CADER ICT support system management on teachers ICT proficiency. As discussed before, Jordan Ministry of Education believes that CADER programme plays an essential role in improving teacher skills in ICT. Also, this programme can support government and policy makers to achieve their goals related to educational growth. Consequently, the result of this study can help decision makers and MOE to get clearer picture about the