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ICT Competencies Availability among General Education Schools Teachers in Kuwait
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Abstract

This study aimed to demonstrate and identify the extent/degree to which teachers in general education schools in the State of Kuwait possess information and communication technology (ICT) competencies based on their point of view. In addition, the research discusses the impact of some independent variables (i.e., gender, specialization, and years of professional experience) on the acquisition level. The study adopted the analytical, exploratory, descriptive, quantitative research methodology, and used the questionnaire as a tool to collect data. A stratified random sample of 1,299 teachers participated electronically in this research study during the first semester of the 2020/2021 school year. The results indicated that the degree of availability of ICT competencies among the teachers in general education schools in the State of Kuwait was generally "medium/average" (*M* = 2.45, *SD* = 0.84, RII = 0.49). Where the estimates of the teachers indicated that the extent to which they possess ICT competencies is "medium/average" in all of the study's dimensions. The findings of the study also revealed that there are statistically significant differences at the significance level of 0.01 among the averages of teachers' responses regarding the degree to which they possess ICT competencies due to the variables of gender (in favor of the female category), specialization (in favor of the scientific specializations category), and years of professional experience (in favor of the category with the lowest years of experience; less than 10 years), in all of the study's dimensions separately, and in the tool as a whole. The study concluded with some recommendations.

Keywords*:* information and communication technology competencies, ICT competencies, educational/instructional technology competencies, electronic teaching and learning competencies, distance teaching and learning competencies, degree/level/extent of acquisition/possession, perceptions/opinions of teachers, PreK-12 education, State of Kuwait

Introduction

Our current world is witnessing a revolution in digital technology in the field of information and communication technology (ICT), and the resulting explosion of knowledge and rapid, continuous, and successive developments that have affected all aspects and areas of life becoming an integral part of its formation and practices. The educational field is no exception. This has broadened new horizons and created opportunities for advancing traditional teaching and learning through ICT means, tools, applications, services, networks, and resources, to serve the teaching and learning process within the framework of what is known as e- or digital education. Therefore, it is necessary to revolutionize the educational system with its teaching and learning methods to create a conscious generation through the successive and rapid changes and developments that necessitate working to achieve comprehensive and sustainable development, in light of electronic or digital culture, and the role of ICT in developing, diversifying, and adapting teaching and learning opportunities, situations, and experiences.

We live in an era that is closely linked to the importance of using technological innovations and employing them in teaching and learning. This imposed on the educational system the necessity of keeping pace with this development and adopting its outcomes. To develop and improve educational outcomes at all levels of education. Here, the role of the teacher emerges in the application of these ICT tools and the use of these technological innovations during teaching to develop the various skills of their students in order to keep them up to pace with this technology and knowledge development with all its requirements, so the preparation, qualification, and professional development programs for teachers have tended to develop technological competencies for them in various disciplines, through the provision of various educational and training programs that support this trend; to support the capabilities of teachers in this digital age of knowledge to perform their work efficiently, accurately, skillfully, and proficiently, in a professional manner.

In the spring of 2020, the novel Coronavirus (COVID-19) pandemic changed our world and our societies suddenly and radically at all levels and fields, including educational systems. Educators were called upon to respond to the repercussions and challenges that the pandemic has brought to our educational system. So, decisions emerged from officials of the Ministry of Education and Higher

Education in the State of Kuwait to use distance/remote learning strategy in all government educational institutions when traditional education was no longer deemed safe. Accordingly, school environments have been transformed in all parts of Kuwait and relied mainly on ICT-based teaching and learning as an option and an inevitable strategic direction in adapting to the educational repercussions of this pandemic on the one hand, and to developing and advancing the teaching and learning processes on the other. In re-engineering the institutions and practices we traditionally have relied on, we aim our educational systems to be compatible with scientific and technical developments, and the modern ICT revolution. This advanced technology, when applied in teaching and learning, needs an elaborate administrative organization based on scientific and objective foundations to ensure the achievement of educational objectives at all levels.

Research studies have proven that the employment of ICT means, tools, applications, platforms, services, resources, and networks both in traditional educational environments (face-to-face) or virtual (distance/remote) is educationally feasible and efficient. This indicates that digital/electronic teaching and learning is the modern mode of education (Alajmi, 2019; Alajmi & Alarfaj, 2018; Al-Basheer, 2019; Aldhafeeri, 2015; Aldhareeri, 2016; Alenezi, 2017; Alhumidi, 2018; Ali & Almeqbel, 2017; Safar, 2020; Safar & Agha, 2020a; Safar & Qabazard, 2019). We find that voices have risen calling for the need to enhance the ICT competencies among teachers, which is one of the most important modern trends closely related to the use of ICT tools, applications, platforms, services, resources, and networks in the teaching and learning (education) field (Ababneh & Alqadere, 2011; Alhumidi, 2018; Ali & Almeqbel, 2017; Al-Maamari & Al-Masrouri, 2013; Al-Mohammed & Siam, 2016; Al-Qudah & Hamadnah, 2012; Al-rsa'i, 2017; Alsaadi, 2017; Alwendawi, 2017; Ebrahim & Al-Failkawei, 2018; Elagrami, 2012; Heyyassat, 2010; Hinnawi & Najm, 2019; International Society for Technology in Education [ISTE], 2021; Laiza & Khemisti, 2019; Nimer & Al-Jarrah, 2015; Omar, 2014; Safar & Agha, 2019a, 2019b, 2019c, 2020b; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018). Technological competencies are defined as a set of abilities and knowledge - information, skills, attitudes, values, and experiences (scientific, practical, and social) - that the teacher possesses, masters, and improves their practice when planning, designing, implementing/producing, using, assessing, and managing the educational process in order to achieve effective digital teaching and learning (Safar & Alqadiri, 2017b).

This significant growth in the use of technology has imposed a great deal on teachers of various specializations in this digital age, ultimately requiring them to possess new capabilities and knowledge. Moreover, this requirement is to progress in line with the tremendous scientific and technological advancements and to meet the demands and challenges of the ICT revolution—some of which are being related to the cognitive aspect in their field of specialization, which includes the employment of technological innovations in teaching and learning methodologies/strategies, measurement and assessment techniques, and frameworks for managing the educational (teaching and learning) process. Therefore, acquisition of ICT competencies has become one of the necessary and vital basic requirements for the teacher of this digital knowledge age.

The results of several research studies confirmed this notion, such as: Heyyassat's study (2010), Ababneh and Alqadere's study (2011), Elagrami's study (2012), Al-Qudah and Hamadnah's study (2012), Al-Maamari and Al-Masrouri's study (2013), Omar's study (2014), Al-Kouli's study (2015), Nimer and Al-Jarrah's study (2015), Al-Mohammed and Siam's study (2016), Muhammad's study (2016), Alakloby's study (2017), Al-rsa'i's study (2017), Alsaadi's study (2017), Alwendawi's study (2017), Bushnaq's study (2017), Shaheen's study (2017), Ali and Almeqbel's study (2017), Ebrahim and Al-Failkawei's study (2018), Alhumidi's study (2018), Alzahrani's study (2018), Al Smadi's study (2019), Laiza and Khemisti's study (2019), Hinnawi and Najm's study (2019), and the studies of Safar and Agha (2019a, 2019b, 2019c, 2020b). These studies asserted that it is vital to pay close attention to developing, possessing, and using ICT competencies among teachers, both pre- and in-service, through teacher preparation programs as well as training and professional development courses.

Problem of the Study

Educational systems pay great attention to the teacher, who is one of the main pillars of comprehensive educational process, and active teaching and learning—based on planning, and centered around learner's activity and his/her participation in the group. Until recently, attention in the field of teachers education was focused more on enabling teachers to implement schools' curricula effectively, by focusing on the objectives and content of the curriculum and revolving it around the learner. Despite the importance of this trend in the educational process; however, the steady and rapid advances in the ICT field, and what followed in the

development of the ideas, concepts, methods, and educational practices, yielded the attention in the past two decades in teacher preparation programs (pre-service) as well as training and professional development courses (in-service) to be directed towards the integration and the efficient use of ICT means, tools, applications, platforms, services, networks, and resources into education (teaching and learning).

The success of educational institutions in achieving their desired goals depends primarily on the teacher, because he/she is considered the main cornerstone. Whatever buildings, facilities, equipment, curricula, etc. are available in the educational environments; they will not be effective unless they are adopted by a qualified teacher, who believes in his/her educational mission as a support and aid. All the elements of the educational system, despite their importance, do not achieve their educational objectives unless they find a teacher who is capable of benefiting from them efficiently; because it is the decisive factor to raise the new young generation. Therefore, the teacher must attain the capabilities, competencies, and modern digital knowledge that could help him/her to carry out the responsibilities and roles entrusted to him/her. This attainment is done to confront the rapid changes in this digital age of knowledge, and thus contributes to the development of his/her performance and professional success which subsequently leads to the improvement of educational outcomes.

Modern education believes that the effective educational performance of the modern digital teacher inside and outside the classroom includes possessing a set of general and specific educational competencies. The teacher cannot exercise his/her various modern educational roles and responsibilities unless he/she possesses these basic competencies and skills that are related to and affect his/her professional performance. The movement of preparing and qualifying teachers based upon competencies is one of the most prominent features of contemporary educational innovations, and the most common in professional educational circles. The interest of reforming teacher preparation programs in the 21st digital knowledge century depending on competencies philosophy has expanded tremendously until it has become a distinctive facet for most of the modern teacher preparation programs, as well as their training and professional development programs in most of the developed countries. Among the most prominent and important of these competencies—which are related to all of the scientific and life fields—are the ICT competencies of the 21st century.

The current health crisis—related to the emergence Coronavirus (COVID-19) pandemic—and its educational implications had demonstrated the importance of integrating and using technology in the teaching and learning processes; this reinforced the necessity for teachers to possess the required ICT competencies, as well as to learn how to integrate and use such technology in an efficient manner to ensure the optimal fulfillment of their new professional digital educational roles and responsibilities.

Several local research studies revealed that there are a set of obstacles that limit and hinder the optimal integration and use of ICT means, tools, applications, platforms, services, resources, and electronic/digital teaching and learning networks in the governmental educational institutions in the State of Kuwait—whether in traditional educational environments (face-to-face), non-traditional (distance/remote/virtual), or combined (blended). Among the most prominent of these challenges that impede digital readiness, digital empowerment, and/or digital transformation are the following: (1) The lack/shortage of knowledge capacity of human cadres in different educational institutions (e.g., information, skills, competencies, trends, values, and experiences i.e., scientific, practical, and social) in the field of educational ICT, and (2) Lack of proficiency in using technology and dealing with it to serve the educational process due to the lack/shortage of training on how to effectively integrate it, use it, and deal with it optimally—diagnose its problems, find appropriate solutions to it, improve or master its employment, and integrate it into the teaching and learning processes (Alajmi, 2019; Alajmi & Alarfaj, 2018; Al-Basheer, 2019; Aldhafeeri, 2015; Aldhafeeri, 2016; Alenezi, 2017; Alhumidi, 2018; Ali & Almeqbel, 2017; Al Shammari, 2018; Safar, 2020; Safar & Agha, 2020a; Safar & Qabazard, 2019).

The main problem of this study is that teachers in the educational field in the State of Kuwait should possess the required ICT competencies necessary for digital empowerment and transformation in this digital knowledge age. The teacher, who possesses and employs the required ICT competencies needed for his/her profession, is the true translator and implementer of modern educational goals, which are built on foundations, standards, and modern global educational and scientific practices.

Accordingly, in order to ensure the proper functioning of educational institutions, with quality and effectiveness, it becomes imperative for the researchers to verify

the extent to which the teachers in the Kuwaiti general education schools possess the required technological/ICT competencies; to enable them to perform their profession, and to practice it with ease and success.

Research Questions

This study attempts to answer two main questions:

1. To what extent do teachers in general education schools in the State of Kuwait possess ICT competencies, based on their point of view?

2. Does the degree of availability of ICT competencies among teachers in general education schools in the State of Kuwait differ significantly in terms of gender, type of major (specialization), and teaching experience?

Objectives of the Study

The objectives of the study can be summarized as follows:

1. To determine the degree of availability of ICT competencies among teachers at all educational levels in general education schools in the State of Kuwait from their point of view.

2. To scrutinize the impact of gender, type of major (specialization), and years of teaching experience on the degree of availability of ICT competencies among teachers in general education schools in the State of Kuwait.

Significance of the Study

The significance of the study can be summarized as follows:

1. The results of this study can help in reconsidering the process of reforming the professional preparation programs of teachers, in accordance with the nature and requirements of the digital knowledge era, and the tremendous technological development it is witnessing.

2. The results of the study will help determine the ICT competencies, skills, and capabilities of inservice teachers—at all educational stages in general education schools in the State of Kuwait—to facilitate the design of more efficient professional development and training programs/courses in the field of ICT that meet their professional developmental needs in the digital knowledge age.

1. Informing teachers in the general education sector in the State of Kuwait about the ICT competencies can increase their ICT awareness and literacy level (knowledge) assisting their professional practices.

2. This study attempts to provide a list of ICT competencies that teachers must possess in order to be able to carry out their professional tasks at an effective manner.
3. The study helps the members of the technical supervisory body in the Ministry of Education to be guided by the list of ICT competencies when evaluating teachers.
4. Determining the extent to which teachers possess ICT competencies helps to know their strengths and weaknesses in this field.
5. The findings and recommendations of this study can benefit the officials of the Ministry of Education in the State of Kuwait to take what they deem appropriate with regard to the issue of ICT competencies acquisition for teachers, and for the rest of those working in the general education sector.
6. The subject of the current study keeps pace with the trends and modern global educational changes in the field of ICT (educational technology).
7. This study is expected to enrich the body of literature—locally, regionally, and globally—in the field of educational technology and serve as a guide for further future studies on ICT competencies for educators.

Limitations of the Study

The limitations of the study can be categorized as follows:
1. Human limitations: The results represented only the teachers' point of view.
2. Spatial limitations: The study was limited to the general education schools in the State of Kuwait.
3. Time limitations: The study was conducted in the first semester of the 2020/2021 school year.

Literature Review

Below are a set of research studies that shed light on the topic of the current study: ICT competencies for teachers; among them are the following:
(1) Al-Maamari and Al-Masrouri's study (2013): It aimed to reveal the degree of availability of ICT competencies among teachers of social studies in the post-basic education stage in some Omani governorates, in addition to knowing the impact of the variables of gender, specialization, and teaching experience on teachers' responses. To achieve the objectives of the study, the researchers used the descriptive survey method, where they prepared a questionnaire consisting of 37 phrases/competencies distributed over three domains: (a) the basic competencies of computer operation, (b) the competencies of using the resources of the World Wide

Web (Internet), and (c) competencies of employing ICT in teaching and assessing social studies. After verifying the validity and reliability of the tool, it was applied to the study's sample which consisted of 236 male and female teachers of social studies in post-basic schools in the following governorates: Muscat, North Al Batinah, and South Al Sharqiya. The results of the study showed that the degree of availability of ICT competencies for social studies teachers was generally "medium", and also indicated the absence of statistically significant differences between males and females, and between levels of specialization in the tool as a whole, and in all domains separately. The findings also revealed that there were no statistically significant differences between the levels of teaching experience in the tool as a whole, and in most of its domains, except for the core competencies for operating the computer, in which there were statistically significant differences in the teachers' responses in favor of the teachers of the less experienced category (from 1 to 10 years).

(2) The study of Hinnawi and Najm (2019): It sought to identify the degree of readiness of teachers of the first basic stage in public schools in the Nablus Education Directorate in Palestine, to employ e-learning by researching the degree of their attitudes towards e-learning, the level of their competencies in using it, as well as the degree of obstacles to its application. From their point of view, in addition to recognizing the role of a number of variables in their degree of readiness, the study adopted the descriptive, analytical, and correlative approach. The study's population consisted of 617 teachers of the first basic stage in government schools in the Nablus Education Directorate in Palestine and the sample—which was chosen by the random cluster method—consisted of 120 male and female teachers. The questionnaire was used as a tool for data collection after checking its validity and reliability. The study reached the following results: (a) that the degree of possessing e-learning competencies, in general, was between "medium" and "high", (b) there were no statistically significant differences in the areas of trends and obstacles due to the variables: age, the rate of daily use of the Internet, and the number of technical courses, and (c) statistically significant differences were found in the competencies domain due to those variables.

(3) Ababneh and Alqadere's study (2011): It aimed to identify the extent to which science teachers possess computer competencies and the degree to which they practice it in the schools of the North-West Badia District in Jordan, as well as to determine the correlation between the degree of science teachers' possession of

computer competencies and the extent of their practice of it. The study used the descriptive survey research methodology, and its instrument (the questionnaire) was prepared by the researchers, and consisted of 58 phrases/competencies, distributed over four main research domains, namely: (a) general computer competencies, (b) competencies of using computer software in science teaching, (c) competencies of using the Internet in teaching science, and (d) competencies of using dry laboratory in teaching science.

The questionnaire consisted of two parts: the first to assess the degree of competency acquisition, and the second to assess the degree of competency practice in the classroom, from the point of view of the teachers themselves. Its validity and reliability were also verified. As for the study's population, it included all male and female science teachers in schools affiliated with the Directorate of Education for the North-West Badia Brigade in the Mafraq Governorate in Jordan for the 2006/2007 school year, who were 175 male and female teachers, all of whom were recruited for this research. The results of the study showed that the degree of possession of computer competencies among science teachers in the schools of the North-West Badia Brigade was generally "medium". The extent to which teachers possess the competencies of the first research domain (the general computer competencies), the second domain (the competencies of using computer software in teaching science), and the third domain (the competencies of using the Internet in teaching science), were all "medium", while the degree of teachers' possession of the competencies of the fourth research domain (the competencies of using dry laboratory in science teaching) appeared with a "low" measurement. The findings also indicated that the extent of participants' practice of computer competencies was generally "medium" too. In light of these results, a number of relevant recommendations were presented.

(4) The study of Al-Qudah and Hamadnah (2012): It tried to identify the extent to which Arabic language teachers in secondary schools in Mafraq Governorate in Jordan possess e-learning competencies, from their point of view, as well as whether there are statistically significant differences in the participants' responses/estimates that are attributed to some independent variables. The study adopted the descriptive survey research method, and its research tool was a questionnaire consisting of 96 items/competencies distributed over seven main research domains, and it was applied to a sample of 94 male and female teachers. The results of the study indicated that the degree to which the participants

possessed the e-learning competencies was generally "medium"; The extent of acquisition was "medium" in all of the research domains, separately. The findings also showed that there were no statistically significant differences among the participants due to the following variables: gender, educational qualification, and professional experience. The study concluded with a set of recommendations in light of the results.

(5) Elagrami's study (2012): It aimed to identify the availability of e-learning competencies among technology teachers in schools in Gaza governorates in Palestine in light of some variables. To achieve the objective of the study, the researcher utilized the descriptive analytical research methodology, and designed the study's instrument (the questionnaire) which included 69 items/competencies distributed over four main research domains. The tool's apparent validity and reliability were measured and confirmed, then it was applied to a stratified sample of 82 teachers, who were chosen randomly. The results indicated that the degree of teachers' acquisition of e-learning competencies, in general, was "medium". They possess e-learning competencies in "the basics of computer use" domain by 82% (large/high), in "the network services" domain by 76% (medium), in "the design and development of electronic courses" by 66% (low), and in "the management of electronic courses" domain by 64% (low). The findings of the study did not indicate the presence of statistically significant differences among teachers' responses to their degree of availability of e-learning competencies based on the variables of "specialization", or "years of teaching experience". However, statistically significant differences appeared among the participants' average estimates based on the variable of "the educational stage/level" in all domains of the study, with the exception of "the basics of computer use" domain, in favor of those with higher professional experience (5 years and more), versus those with less teaching experience (less than 5 years). But statistically significant differences were found in the rest of the research domains (i.e., network services, designing and developing electronic courses, and managing electronic courses) and in the research tool as a whole, in favor of the most teaching experience.

The study proposed a set of recommendations, including the need to organize training courses in planning, managing, and implementing e-learning for technology teachers to provide them with the necessary e-learning competencies.

(6) The study of Al-rsa'i (2017): It investigated the extent to which the pre-service science teacher possesses ICT competencies in science teaching. It used the descriptive analytical survey method to achieve its research objectives, and a random sample of 163 graduate student teachers were selected from the College of Science at Al-Hussein Bin Talal University. The study reached to construct a scale of ICT competencies for science teacher, which consisted of 52 competencies, and included four main domain/areas: (a) culture, (b) skills, (c) usage/application, and (d) ethics of use. The results of the study showed that the average pre-service science teachers' ratings for their ICT competencies in teaching science, in general, were "medium to low". Specifically, the findings revealed that the participants' average estimates in the domains of "culture" and "usage/application" were at a "low" degree, while their average ratings in the domains of "skills" and "ethics of use" were at a "medium" degree. Among the recommendations and suggestions reached by the study were directing those responsible for designing science curricula and study plans in schools and universities to the ICT competencies, and the importance of training science teachers on the effective use and integration of ICT tools, apps, networks, and resources in teaching science in Jordan.

(7) Al-Mohammed and Siam's study (2016): Its pursued objective was to identify the degree of availability of e-learning competencies among teachers of informatics in public secondary schools, and the second cycle of basic education in the domains/areas of: (a) knowledge of e-learning, (b) the use of the Internet, (c) the skill of using educational multimedia, and (d) the use of computer software (applications).

In addition, determining whether there are statistically significant differences among teachers' responses to the extent to which they possess e-learning competencies that can be attributed to the variables of "gender" and "years of experience". The study relied on the descriptive analytical survey approach, and the researchers used the study's instrument (the questionnaire) after making sure of its validity and reliability, and it consisted of 43 e-learning competencies, distributed over four main domains.

The study sample included 364 male and female informatics teachers in the schools of Damascus in the secondary stage as well as the second cycle of basic education. The findings of the study indicated that the degree of availability of e-learning competencies among informatics teachers was generally at a "high" degree; the

participants' average estimates in the domains of "using computer software/applications" and "using the Internet" were "high", while their average responses in the domains of "the skill in using educational multimedia" and "knowledge of e-learning" were "medium". The results also revealed the absence of statistically significant differences among the participants' average scores for the extent of availability of their e-learning competencies attributed to the "gender" variable, while these statistically significant differences were found in the teachers' estimates according to the variable "years of experience", and in favor of the higher teaching experience (5 to 15 years) in the research tool as a whole, and in the domain of "e-learning knowledge" per se. The study presented several recommendations, the most important of which is the necessity of encouraging teachers to use e-learning media/tools in teaching and learning, exchanging information via the Internet, and holding training courses for them.

(8) The study of Heyyassat (2010): It aimed to know the degree of availability of technological competencies among teachers, and the extent of their practice of them from the point of view of school principals and educational supervisors in the Directorate of Education at Ramtha District in Jordan. The study population consisted of all 87 school principals and educational supervisors, all of whom were considered a sample for the study. The researcher used the descriptive survey research methodology. A questionnaire was designed, which in its final form—after ensuring its validity and reliability—consisted of 30 technological competencies and distributed into four main domains/areas: (a) instructional design, (b) teaching methods/strategies, (c) the use of educational technology tools/media, and (d) assessment and measurement. The results of the study showed that the participants' average estimates of the degree of their availability of the necessary ICT competencies were generally "high", while their average responses to the degree of their practice of them, in general, were "medium". The study recommended conducting more research studies on the topic of the study and qualifying teachers on the basis of possessing and practicing technological competencies.

(9) Omar's study (2014): It sought to identify the extent to which middle school teachers possess educational technology competencies and the level of their practice of it based on their point of view. The study used the descriptive quantitative research method, and its data collection tool was a questionnaire that was prepared based on previous studies, and its validity and reliability were verified. In its final form, it consisted of 19 technological competencies distributed over three main

domains/areas: (a) computer skills, which contained seven competencies, (b) the use of the computer in the educational process, which included five competencies, and (c) the teaching aids, which included seven competencies. The study was applied to a sample of 106 male and female teachers in the 2009/2010 academic year, and its results revealed clearly that the degree of middle education teachers' possession of educational technology competencies and the level of their practice in them were generally "medium". The findings also disclosed that there were no statistically significant differences among the participants' responses to their ICT competencies acquisition and practice levels due to the variables of "gender", "teaching experience", and "educational qualification". The study recommended paying attention to the professional development and training programs of teachers on educational technology competencies before and during service, according to their professional development and training needs.

(10) The study of Nimer and Al-Jarrah (2015): It aimed to determine the degree to which chemistry teachers practice educational technology competencies based on their point of view, and from the point of view of their students in Jordan. In order to achieve the objectives of the study, the researchers prepared two questionnaires: the first for teachers, and the second for learners. Each questionnaire contained five domains/areas (i.e., science laboratory, use of ICT media/tools to aid in teaching/learning, instructional design, production of educational materials, programs, operation of devices, and assessment). The study used the descriptive survey research methodology, and its sample consisted of 992 male and female students, and 38 male and female teachers who teach chemistry for the secondary stage in the Qweismeh District Education Directorate in Jordan. The results of the study showed that the degree of the practice of educational technology competencies among chemistry teachers—from their point of view, and from the point of view of their students—in general, was between "medium" and "high". The findings also revealed that there were statistically significant differences in the degree of practicing technological competencies among the participants attributed to the "gender" variable of the teacher, in favor of female teachers, and also to the variable of "the grade level", in favor of the second-year secondary learners. The results indicated that there were no statistically significant differences in the degree of participants' practice of technological competencies due to the variables of "the teacher's teaching experience" and "the gender of the learner". In light of the findings, the study recommended conducting more studies that examine the degree to which teachers of other subjects/disciplines practice educational technology

competencies based on the estimates of other parties (e.g., school principals and educational supervisors), and work on preparing professional development and training programs for in-service teachers, which provide them with the educational technology (ICT) competencies necessary to carry out effective teaching.

(11) Wei et al.'s study (2016): It pursued the identification of the relationship between the ICT competencies possessed by the teacher and the extent of his/her acceptance and use of the school's electronic learning/teaching management system applied in Negeri Sembilan secondary schools in Malaysia. The study used the descriptive correlational analytical quantitative research methodology, and its data collection instrument was a questionnaire distributed to a stratified random sample that included 417 teachers after ensuring its validity and reliability. The results of the study revealed that teachers have a "high" level of ICT competencies in general and that there is a positive correlation between the degree of teachers' possession of ICT competencies, and the degree to which they accept and use the e-learning management system applied in schools. The study recommended, in light of its results, the need for teachers to acquire a higher level of ICT competencies, and educational policymakers should design new programs/courses for the professional development and training of teachers; To employ more effective and efficient ways of using and integrating technology to implement, assess, and manage the teaching and learning processes of education.

(12) The study of Gündüz (2020): It sought to identify the views of pre-service teachers about the teaching and learning processes, and its effectiveness when supported by the use of educational ICT tools, applications, platforms, services, networks, and resources, in addition to their point of view on the extent of their possession/acquisition of the ICT competencies. It adopted the descriptive correlative survey research design, and the study's instrument (the questionnaire) consisted of several phrases/items that revolve around four main ICT competencies domains. The sample of the study included 420 students-teachers who were randomly selected from the Faculty of Education at a public university in Turkey in the 2019/2020 academic year. According to the results of the study, it was noted that pre-service teachers' ratings/estimates about teaching and learning, and ICT support for them were generally "below average". The same applies to their view of the degree to which they possess ICT competencies; It was generally "below average". As for the statistically significant differences in the participants' responses, the findings asserted that they were not available according to the

variables of "gender" and "grade level". The study concluded that teachers should be professionally trained to develop their knowledge, skills, and competencies in technology (ICT), teaching and learning methods/strategies, content development/knowledge, as well as teachers should have some technological competencies to properly employ ICT means and services in their teaching and learning activities.

(13) Safar's study (2021): It aimed to demonstrate the extent/degree to which faculty members at Kuwait University possess ICT competencies based on their point of view, in addition to revealing the impact of some independent variables (i.e., gender, specialization, and years of professional experience) on the acquisition level. The study adopted the analytical, exploratory, descriptive, quantitative research methodology, and used the questionnaire as a tool to collect data. A stratified random sample of 441 faculty members participated electronically in this study during the second semester of 2019/2020 academic year. The results indicated that the degree of availability of ICT competencies among the faculty members at Kuwait University was generally "medium/average" (*M* = 2.65, *SD* = 0.99, RII = 0.53). Additionally, the estimates of the faculty members indicated that the extent to which they possess ICT competencies is "medium/average" in all of the study's domains/topics. The findings of the study also revealed that there were statistically significant differences at the significance level of 0.01 between the responses of faculty members regarding the degree to which they possess ICT competencies due to the variables of "gender" (in favor of the female category), "specialization" (in favor of the category of scientific specializations), and "years of professional experience" (in favor of the category with the highest years of experience, more than 10 years), in the vast majority of the study's domains/topics separately, and in the research tool as a whole. The study concluded with some recommendations.

Commenting on Previous Studies

Through the researchers' review of all previous research studies, it can be said that all of them dealt with the extent/degree of possession/availability of ICT competencies among the category of faculty members (teachers), whether before or during the service; For example the Gündüz's study (2020) and the study of Al-rsa'i (2017) which both sought to identify the possession of pre-service teachers who are graduates/alumni of the College of Education and the College of Science, respectively, for these competencies. While the study of Hinnawi and Najm (2019) determined the extent of acquisition of these ICT competencies by teachers of the

first basic stage in public schools. Also, the study of Al-Maamari and Al-Masrouri (2013) which aimed to know the availability of the ICT competencies among teachers of social studies in the post-basic education stage, as well as Omar's study (2014) which investigated the degree of possessing these competencies among male and female teachers of middle education. As for the secondary level, each of the following studies focused on the degree to which teachers possess ICT competencies, such as: Arabic language teachers in the study of Al-Qudah and Hamadnah (2012), chemistry teachers in the study of Nimer and Al-Jarrah (2015), informatics teachers in the study of Al-Mohammed and Siam (2016), and the Negeri Sembilan secondary schools' teachers in Malaysia in the study of Wei et al. (2016). The following studies: Ababneh and Alqadere's study (2011) and Elagrami's study (2012) agreed with the above studies in determining the extent to which science teachers and technology teachers, respectively, possess ICT competencies, while they differed with them in verifying this in several schools in a specific educational district. The study of Heyyassat (2010) agreed in verifying the availability of these ICT competencies among teachers, but it took the views of school principals and educational technical supervisors on this matter, not the opinions of the teachers themselves. While the Safar's study (2021) focused on the degree to which faculty members at Kuwait University possess these competencies.

The current research study has benefited from its predecessors in building its theoretical framework, and defining its problem, methodology, and related concepts. It also helped design/build its appropriate research instrument to collect the required data with accuracy and objectivity. The previous studies likewise contributed to choosing the most important statistical analyses procedures appropriate to the current study, how to analyze its data, produce its descriptive and inferential statistics tables, write its results and the way to discuss it, and be familiar with its recommendations and suggestions.

However, what distinguishes the current study from its predecessors is that: (1) It included the opinions of all subjects/disciplines' teachers of different genders, nationalities, specializations (literary/AHSS and scientific), qualifications, ages, years of professional experience, type of schools (public and private), and their educational districts, as well as their distribution at all educational stages/levels from kindergarten to secondary school; (2) The current study research tool included 92 phrases/paragraphs (competencies) distributed over three main research domains/areas, which cover the core topics/dimensions in the field of

ICT—which are about 29 topics—and constitute in their entirety the basic knowledge of digital empowerment in the twenty-first century, therefore it can be considered and counted as a comprehensive and adequate measurement tool that contains all of the ICT competencies that should be available to all members of the various educational institutions in the educational sector of any country; and (3) the current study tool (the questionnaire) can be applied to all employees of institutions affiliated with the educational sector in any country (such as: members of the teaching, administrative, and technical supervisory bodies, as well as learners, and the rest of the workers), whether in institutions of basic education or higher education.

Methodology

Research Design

The present study adopted a descriptive analysis research methodology based primarily on a quantitative approach, which employed a survey questionnaire technique, a convenience sampling method, and descriptive and inferential statistics. This research design is one of the most appropriate scientific research methods to the nature of this type of studies from the point of view of a large number of researchers. It is more comprehensive than other approaches and is concerned with describing societal phenomena or problems as they are on the ground through a comprehensive survey of a specific group of society, and researchers use it frequently (Creswell & Creswell, 2018; Fraenkel et al., 2019; Healey, 2016; Johnson & Christensen, 2020; Levin et al., 2016; Patten & Newhart, 2018).

Sample

A stratified sample of 1,299 inservice teachers from all education stages of the general education schools (public and private) in the State of Kuwait participated electronically in this study during the first semester of the 2020/2021 school year. The sample evidenced a similar mix of ethnic and socioeconomic backgrounds and included teachers from a variety of majors/disciplines.

Instrument

After reviewing the literature and previous research studies related to the study's topic, the research's instrument (i.e., survey questionnaire) was designed with precision and objectivity, and it included two main parts: (1) demographic data, and (2) the main domains/topics of the study. The first part consisted of 11

questions that provide us with general demographic data, including professional information that reveals the nature of the sample members. As for the second part, it included 92 phrases/clauses (i.e., ICT competencies) distributed over the three main domains/constituents of the study; 45, 18, and 29 competencies, respectively.

These 92 ICT competencies are originated from the 29 ICT topics/areas/themes identified by Safar (2020), Safar and Agha (2020a), as well as Safar and Alqadiri (2023), and they are a comprehensive and integrated set of modern digital capabilities (i.e., knowledge)—information, skills, competencies, trends, values, and experiences (e.g., scientific, practical, and social) (Safar & Alqadiri, 2017a)—that teachers must possess and practice effectively in their profession. They constitute in their entirety the basic knowledge of digital empowerment in the twenty-first century, and they are as follows: (1) technology, computer, information, and telecommunication literacy; (2) file and information systems management; (3) word processing; (4) spreadsheets; (5) presentations; (6) databases; (7) forms; (8) graphics editing; (9) mind maps; (10) infographics; (11) desktop publishing; (12) digital media: video editing; (13) digital media: audio editing; (14) multimedia; (15) animations; (16) websites design; (17) programming/coding; (18) virtual reality (VR); (19) augmented reality (AR); (20) artificial intelligence (AI); (21) educational software; (22) networking; (23) Internet, telecommunications, and social networking; (24) library and information sciences; (25) e-publication; (26) distance teaching/learning; (27) e-teaching/learning; (28) e-training; and (29) e-measurement/assessment.

The items (i.e., ICT competencies) were rated (i.e., rank ordered) using a Likert-type 5-point scale to determine their availability (i.e., 1 = very low, 2 = low, 3 = medium, 4 = high, and 5 = very high). The questionnaire was then submitted to a panel of experts in this field for their review and was later pilot tested with a selection of inservice teachers from general education schools who were not part of the study's sample. The tool was carefully evaluated by the experts with respect to its validity and reliability, and it achieved a 0.995 Cronbach's alpha (α) coefficient value (considered "excellent" in most social sciences and humanities studies) (Healey, 2016; Levin et al., 2016).

Table 1. Reliability statistics of the domains of the ICT competencies questionnaire.

No.	Domain/Component	Number of	Cronbach's	Internal Consisten

		Competencies	Alpha	cy
1	The basic competencies for using computers	45	0.990	Excellent
2	The competencies of using the Internet/web resources	18	0.978	Excellent
3	The competencies of using ICT tools into education (for teaching/learning & measurement/assessment)	29	0.989	Excellent
	Overall Consistency/Reliability Coefficient	92	0.995	Excellent

Data Collection

The data were collected over a three-month period (during the first semester of the 2020-2021 school year) using an anonymous questionnaire that was administered through an online survey tool and distributed electronically to inservice teachers using various ICT media/platforms. The teachers were asked to voluntarily participate and complete the survey questionnaire. They were instructed to respond to the questionnaire statements/questions truthfully and honestly. Participants were assured that their data would be kept confidential and would be used only for statistical analysis purposes.

Methods of Analysis

Various methods of statistical analysis were used to explore and analyze the collected data. These techniques met the basic parametric assumptions required for their implementation. The descriptive analysis procedures applied were Cronbach's alpha, frequency, percentage, mean, standard deviation, relative importance index (RII), and relative weight (RW). A series of comparisons—independent-samples t-tests—were also employed to assess the differences between/among the groups of inservice teachers in terms of the following independent variables: gender, type of major (specialization), and years of professional experience (teaching experience). An alpha (α) threshold of 0.05 was selected for the inferential tests. Table 2 defines the statistical standard used for interpreting the participants' responses to the domains of the ICT competencies questionnaire (Akadiri, 2011; Safar, 2020).

Table 2. The statistical criterion for interpreting the participants' responses to the domains of the ICT competencies questionnaire according to the extent of the relative importance indexes (relative weights).

Relative Importance Indexes Range	Relative Weights Range	Availability/Acquisition Degree/Extent
0.80 – 1.00	80.0 – 100.0	Very high/very large
0.60 – 0.79	60.0 – 79.0	High/large
0.40 – 0.59	40.0 – 59.0	Moderate/medium/ average
0.20 – 0.39	20.0 – 39.0	Low
0.00 – 0.19	0.0 – 19.0	Very low

Results and Discussion

First: Demographic profile of the respondents.

Table 3 outlines the demographic profile of the inservice teachers.

Table 3. Participants' demographic information in frequencies and percentages.

Variable	Category	*N*	%
Gender	Male	741	57.0
	Female	558	43.0
Nationality	Kuwaiti (Citizen)	846	65.1
	Non-Kuwaiti (Resident)	453	34.9
Type of Major	Arts, humanities, & social sciences (AHSS) disciplines	717	55.2
	Scientific disciplines	582	44.8
Qualification	Bachelor	1,029	79.2
	Master/doctorate	270	20.8
Age	20 to < 30 years	216	16.6
	30 to < 40 years	345	26.6
	40 to < 50 years	453	34.9
	50 years and more	285	21.9
Years of Professional Experience	0 to < 10 years	414	31.9
	10 to < 20 years	423	32.6
	20 years and more	462	35.6

Type of School	**Public general education schools**	**1,050**	**80.8**
	Private general education schools	**249**	**19.2**
Educational Area/District	**Al-Ahmadi**	**204**	**15.7**
	Al-Jahra	**189**	**14.5**
	Hawalli	**258**	**19.9**
	Al-Asema	**189**	**14.5**
	Al-Farwaniya	**246**	**18.9**
	Mubarak Al-Kabeer	**213**	**16.4**
Educational Stage	**Kindergarten**	**138**	**10.6**
	Primary	**138**	**10.6**
	Intermediate	**528**	**40.6**
	Secondary	**495**	**38.1**
ICT Efficacy Level	**Low (beginner)**	**252**	**19.4**
	Moderate (intermediate)	**918**	**70.7**
	High (expert/advanced)	**129**	**9.9**
International ICT Certifications Ownership	**Does hold an international ICT certificate**	**1,122**	**86.4**
	Does not have an international ICT certificate	**177**	**13.6**

Second: Research questions' results.
The results for research question no. 1.

Research question no. 1 was stated as follows: To what extent do teachers in general education schools in the State of Kuwait possess ICT competencies based on their point of view? The survey included 92 items (ICT competencies)—distributed over three main research domains—addressing the overall availability/acquisition degree/extent of ICT competencies. After the answers were submitted, a set of descriptive statistics were used to analyze the data, which are comprehensively displayed in Table 4.

Table 4. Descriptive statistics of the inservice teachers' responses to the domains of the ICT competencies questionnaire.

No.	Domain/Component	Number of Items	Mean	Std. Deviation	RII	Availability/Acquisition Degree/Extent	Rank
1	The basic competencies for using computers	45	2.51	0.86	0.50	Medium/Average	1
2	The competencies of using the Internet/web resources	18	2.37	0.84	0.47	Medium/Average	3

3	**The competencies of using ICT tools into education (for teaching/learning & measurement/assessment)**	**29**	**2.49**	**0.90**	**0.50**	**Medium/Average**	**2**
	Overall Availability/Acquisition Degree/Extent of ICT Competencies	**92**	**2.45**	**0.84**	**0.49**	**Medium/Average**	

Table 4 shows that the degree of availability of ICT competencies among general education schools' teachers in the State of Kuwait, in general, was "medium" (*M* = 2.45, *SD* = 0.84, RII = 0.49). The average teachers' ratings indicated that the degree of their possession of ICT competencies was "medium" in all research domains; and came in the following order: "the basic competencies for using computers" came in the first place (*M* = 2.51, *SD* = 0.86, RII = 0.50), second rank was taken by "the competencies of using ICT tools into education (for teaching/learning & measurement/assessment)" (*M* = 2.49, *SD* = 0.90, RII = 0.50), and "the competencies of using the Internet/web resources" ranked third and last (*M* = 2.37, *SD* = 0.84, RII = 0.47).

The previous result agreed in its entirety with the results of other research studies, such as the following: (1) the study of Ababneh and Alqadere (2011) which showed that the degree of acquisition of computer competencies of science teachers in the schools of the North-West Badia Brigade was generally "medium"; (2) the study of Elagrami (2012) which indicated that the degree of teachers' possession of e-learning competencies, in general, was "medium"; (3) Al-Qudah and Hamadnah's study (2012) which revealed that the degree of acquisition of e-learning competencies by Arabic teachers in the secondary stage was generally "medium"; (4) Al-Maamari and Al-Masrouri's study (2013) which disclosed that the degree of possession of ICT competencies among social studies teachers in post-basic education in some Omani governorates was generally "medium"; (5) the study of Omar (2014) which showed that the degree to which teachers of middle education possess ICT competencies and the level of their practice of it, in general, was "medium"; (6) Al-Qubati's study (2015) which indicated that the degree to which students of open education faculties and distance learning centers in Yemeni universities possess the competencies of e-learning was generally "medium"; and (7) Safar's study (2021) which revealed that the degree of availability of ICT

competencies among faculty members at Kuwait University was generally "medium".

On the other hand, other research studies revealed different findings compared to the current study, such as the following: (1) Nimer and Al-Jarrah's study (2015) which showed that the degree of the practice of ICT competencies among chemistry teachers—from their point of view and from the point of view of their students—in general, was between "medium" and "high"; (2) the study of Hinnawi and Najm (2019) which found that the degree of possessing technological competencies, in general, was between "medium" and "high"; (3) the study of Al-Mohammed and Siam (2016) which indicated that the availability of e-learning competencies among informatics teachers was generally at a "high" degree; (4) Heyyassat's study (2010) which exhibited that the average estimates of the participating teachers for the degree of availability of the necessary ICT competencies for them generally reached a "high" degree; (5) the study of Wei et al. (2016) which found that teachers have a "high" level of acquisition of ICT competencies; (6) Al-rsa'i's study (2017) which showed that the general average of pre-service science teachers' ratings to the extent that they possess ICT competencies in science teaching varied between "medium" to "low"; and (7) Gündüz's study (2020) in which it was noted that the averages of pre-service teachers' estimates of the degree to which they possess ICT competencies was generally "below the average". Tables 5 to 7 describe in detail the descriptive statistical analysis of each research domain and its related ICT competencies, in descending order.

Table 5. Descriptive statistics of the inservice teachers' responses to the domain no. 1 of the ICT competencies questionnaire: The basic competencies for using computers.

No.	ICT Competency	Mean	Std. Deviation	RII	Availability/Acquisition Degree/Extent
1	I am familiar with basic programming/coding instructions in different programming languages such as Visual Basic, Hypertext Markup Language (HTML), and others.	2.83	1.19	0.57	Medium/Average
2	I can use the basics of animations software such as Flash, Director, SWiSH Max, Powtoon, Animaker, Vyond, Renderforest, and others.	2.82	1.16	0.56	Medium/Average

3	I use the basics of website design software such as FrontPage, SWiSH Max, and others.	2.81	1.17	0.56	Medium/Average
4	I can use artificial intelligence (AI) software.	2.80	1.15	0.56	Medium/Average
5	I use the basics of audio editing software such as Audacity, Audition, and others.	2.76	1.14	0.55	Medium/Average
6	I use the basics of infographics software such as Piktochart, Easel.ly, Venngage, and others.	2.76	1.16	0.55	Medium/Average
7	I deal with the basics of multimedia software such as Scratch, Director, and others.	2.75	1.13	0.55	Medium/Average
8	I am good at using augmented reality (AR) software.	2.74	1.12	0.55	Medium/Average
9	I use the basics of desktop publishing software such as Publisher, InDesign, Illustrator, Smilebox, and others.	2.74	1.12	0.55	Medium/Average
10	I can use virtual reality (VR) software.	2.72	1.09	0.54	Medium/Average
11	I can use the basics of mind mapping software such as Ayoa, formerly iMindMap, Inspiration, MindMeister, and others.	2.71	1.11	0.54	Medium/Average
12	I use e-measurement/assessment software/systems/platforms such as ClassMarker, ProProfs Quiz Maker, and others.	2.70	1.14	0.54	Medium/Average
13	I use the basics of databases software such as Access, Oracle, and others.	2.65	1.05	0.53	Medium/Average
14	I am good at using e-training software/systems/platforms.	2.62	1.07	0.52	Medium/Average
15	I can use the basics of video editing software such as Windows Movie Maker, iMovie, Premiere, WeVideo, Animoto, Biteable, Spark Video, and others.	2.61	1.08	0.52	Medium/Average
16	I use operating systems software for the computer, which works	2.61	1.09	0.52	Medium/Average

	based on windows environment, such as Windows, Macintosh, Linux, and others.				
17	**I use the basics of forms software to produce forms, tests, quizzes, surveys, and polls, such as Microsoft Forms, Google Forms, SurveyMonkey, ProProfs Survey Maker, and others.**	**2.59**	**1.06**	**0.52**	**Medium/Average**
18	**I deal with the basics of graphics editing software such as Paint, Photoshop, CorelDRAW, PaintShop Pro, Picozu, PicMonkey, and others.**	**2.58**	**1.02**	**0.52**	**Medium/Average**
19	**I am familiar with various computer networks and know how to deal with them.**	**2.57**	**1.04**	**0.51**	**Medium/Average**
20	**I can use e-teaching/learning software/systems/platforms.**	**2.57**	**1.04**	**0.51**	**Medium/Average**
21	**I am good at using distance teaching/learning software/systems/platforms.**	**2.57**	**1.05**	**0.51**	**Medium/Average**
22	**I have the ability to use educational software.**	**2.54**	**1.02**	**0.51**	**Medium/Average**
23	**I have the ability to compress and decompress files using a decompression program such as WinRar, WinZip, and others.**	**2.54**	**1.06**	**0.51**	**Medium/Average**
24	**I can use the basics of spreadsheets software such as Excel, Sheets, Numbers, and others.**	**2.53**	**1.00**	**0.51**	**Medium/Average**
25	**I have sufficient computer/technology/ICT literacy (i.e., I possess the knowledge - such as information, concepts/terminologies, facts, opinions, issues, theories, laws/regulations, generalizations, trends, values, competencies, skills, and experiences (e.g., scientific, practical, and social) - in the world of computers, information and communication technology, and the**	**2.52**	**0.99**	**0.50**	**Medium/Average**

	Internet.				
26	**I can work with operating systems software for smart devices (i.e., smartphones and tablets) such as iOS, Android, and others.**	**2.52**	**1.02**	**0.50**	**Medium/Average**
27	**I can use the basics of video conferencing software such as Teams, Zoom, Meet, Skype, Webex, and others.**	**2.48**	**1.00**	**0.50**	**Medium/Average**
28	**I am good at using cloud storage tools/services such as Drive, Dropbox, OneDrive, Box, and others.**	**2.48**	**1.01**	**0.50**	**Medium/Average**
29	**I have the ability to use security and protection software to scan and remove viruses.**	**2.42**	**1.01**	**0.48**	**Medium/Average**
30	**I can distinguish between different file formats/extensions such as PDF, PPT, DOC, RTF, XLS, PNG, JPEG, MP3, MP4, HTML, and others.**	**2.41**	**1.02**	**0.48**	**Medium/Average**
31	**I can use the basics of presentations software such as PowerPoint, Slides, Keynote, Emaze, Prezi, and others.**	**2.35**	**0.94**	**0.47**	**Medium/Average**
32	**I know the obstacles of employing computer-assisted teaching and learning software in education (for teaching/learning).**	**2.32**	**0.92**	**0.46**	**Medium/Average**
33	**I have the skill to move between different applications easily to perform more than one task at the same time.**	**2.32**	**0.92**	**0.46**	**Medium/Average**
34	**I am good at using multimedia such as pictures, audios, videos, animations, flashes, etc. with professionalism, and I have the ability to insert and deal with them in various applications.**	**2.31**	**0.95**	**0.46**	**Medium/Average**
35	**I can download, install, and remove various software on/from the computer.**	**2.30**	**0.91**	**0.46**	**Medium/Average**

36	**I use the basics of word processing software such as Word, Docs, Pages, and others.**	**2.28**	**0.94**	**0.46**	**Medium/Average**
37	**I understand the advantages of using computer-assisted teaching and learning software in education (for teaching/learning).**	**2.26**	**0.89**	**0.45**	**Medium/Average**
38	**I can operate and use computer peripherals such as the printer, scanner, digital camera, and others.**	**2.24**	**0.89**	**0.45**	**Medium/Average**
39	**I am good at using the keyboard.**	**2.24**	**0.97**	**0.45**	**Medium/Average**
40	**I have the ability to properly connect or install the wires/cables of the computer and its peripherals.**	**2.23**	**0.98**	**0.45**	**Medium/Average**
41	**I can handle traditional storage devices such as HDD, SSD, CD, DVD, Blu-ray, flash memory, and others.**	**2.22**	**0.92**	**0.44**	**Medium/Average**
42	**I know computer peripherals such as the printer, scanner, speaker, digital camera, modem, etc., and I can handle/operate them easily.**	**2.20**	**0.89**	**0.44**	**Medium/Average**
43	**I understand the impact of technology in general and computers in particular on society, in its positive and negative aspects.**	**2.18**	**0.89**	**0.44**	**Medium/Average**
44	**I know how to operate and shut down the computer.**	**2.18**	**0.96**	**0.44**	**Medium/Average**
45	**I can manage and organize files such as creating, saving, copying, editing, moving, renaming, and deleting.**	**2.17**	**0.90**	**0.43**	**Medium/Average**
	Weighted Average for Domain No. (1)	**2.51**	**0.86**	**0.50**	**Medium/Average**

Table 6. Descriptive statistics of the inservice teachers' responses to the domain no. 2 of the ICT competencies questionnaire: The competencies of using the Internet/web resources.

No.	ICT Competency	Mean	Std. Deviation	RII	Availability/Acquisition Degree/Extent
1	I register in educational forums and participate actively.	2.64	1.15	0.53	Medium/Average
2	I can use massive online open courses (MOOCs) platforms to search for and register in courses that benefit the course/subject/curriculum that I teach and which may contribute to my professional development.	2.62	1.13	0.52	Medium/Average
3	I use e-mail to communicate with learners and teach them.	2.60	1.08	0.52	Medium/Average
4	I can access and search scientific databases (e.g., Dar Al-Mandumah, Al-Manhal, e-Marefa, Eric, Ulrichsweb, ProQuest, Scopus, Web of Science, etc.) for scientific information and documentations across the websites of various educational institutions' libraries for scientific research and professional development purposes.	2.48	1.08	0.50	Medium/Average
5	I am aware of the various methods, types, and advantages of e-publishing for scientific research purposes.	2.47	0.99	0.49	Medium/Average
6	I watch/listen to different video conferences, programs, and podcasts over the Internet.	2.46	0.96	0.49	Medium/Average
7	I am able to employ electronic libraries (i.e., independent and/or academic) in enrichment of teaching and learning methods.	2.46	0.99	0.49	Medium/Average
8	I use video/audio conferencing and chatting software over the Internet.	2.42	0.96	0.48	Medium/Average
9	I can use social media or social networking software, such as Twitter, Facebook, Instagram, Snapchat, Google Plus, and others, to communicate with the learners and teach them.	2.35	1.01	0.47	Medium/Average

10	**I can access electronic libraries and I am good at searching the electronic catalogs affiliated with them through the educational institutions' websites to benefit from them for the purposes of scientific research and professional development.**	**2.31**	**0.92**	**0.46**	**Medium/Average**
11	**I am good at using Internet/web browser software such as Chrome, Safari, Edge, Firefox, and others.**	**2.30**	**0.96**	**0.46**	**Medium/Average**
12	**I am familiar with various ways to connect to the Internet.**	**2.27**	**0.91**	**0.45**	**Medium/Average**
13	**I know how to attach a file (or files) to an email message.**	**2.27**	**0.95**	**0.45**	**Medium/Average**
14	**I understand the importance of dealing with the Internet/web in accordance with the rules/regulations and behavior that must be followed, such as the intellectual property protection and copyright laws, and others.**	**2.25**	**0.91**	**0.45**	**Medium/Average**
15	**I can access the Internet easily and conveniently through smart devices, such as mobiles/smartphones, tablets, and others.**	**2.23**	**0.97**	**0.45**	**Medium/Average**
16	**I can download and/or upload books, documents, and software from the Internet.**	**2.22**	**0.91**	**0.44**	**Medium/Average**
17	**I can use many different search engines, such as Google and/or Yahoo, to browse websites and search for information and digital resources that benefit the course/subject/curriculum with ease.**	**2.20**	**0.92**	**0.44**	**Medium/Average**
18	**I have the ability to create an e-mail account and use it with ease in sending and receiving emails.**	**2.17**	**0.91**	**0.43**	**Medium/Average**
	Weighted Average for Domain No. (2)	**2.37**	**0.84**	**0.47**	**Medium/Average**

Table 7. Descriptive statistics of the inservice teachers' responses to the domain no. 3 of the ICT competencies questionnaire: The competencies of using ICT tools into education (for teaching/learning & measurement/assessment).

No.	ICT Competency	Mean	Std. Deviation	RII	Availability/Acquisition Degree/Extent
1	I use one of the e-teaching/learning management systems/platforms, such as Blackboard, Moodle, Edmodo, Classroom, Schoology, and others.	2.68	1.14	0.54	Medium/Average
2	I support the course/subject/curriculum by using some useful and high-quality educational courses available on the Internet/web in the massive online open courses (MOOCs) platforms.	2.65	1.07	0.53	Medium/Average
3	I collect the information/data of the learners and/or their parents using different applications on computers and/or smart devices.	2.65	1.08	0.53	Medium/Average
4	I use electronic bulletin boards to inform learners about course/subject/curriculum related activities, notifications, and announcements.	2.64	1.10	0.53	Medium/Average
5	I receive and correct learners' assignments/homeworks online.	2.61	1.15	0.52	Medium/Average
6	I use e-measurement/assessment tools such as electronic tests.	2.60	1.07	0.52	Medium/Average
7	I design my course/subject/curriculum electronically and upload it to one of the e-teaching/learning management systems'/platforms' websites.	2.60	1.10	0.52	Medium/Average
8	I convert the content of the	2.59	1.07	0.52	Medium/Average

	course/subject/curriculum into simple and attractive electronic lessons using infographics software.				
9	**I record attendance and absence of learners in electronic records.**	**2.58**	**1.06**	**0.52**	**Medium/Average**
10	**I prepare my surveys/questionnaires and polls, print them, and/or distribute/share them electronically using different software in computers and/or smart devices.**	**2.58**	**1.12**	**0.52**	**Medium/Average**
11	**I encourage learners to discuss the course's/subject's/curriculum's topics by using forums, blogs, and wikis.**	**2.57**	**1.11**	**0.51**	**Medium/Average**
12	**I register in educational and specialized blogs via the Internet to participate and benefit from the innovative applications/practices in teaching and learning methodologies/strategies.**	**2.56**	**1.05**	**0.51**	**Medium/Average**
13	**I share files with learners electronically.**	**2.51**	**1.05**	**0.50**	**Medium/Average**
14	**I am familiar with the standards and principles of educational software evaluation.**	**2.50**	**1.01**	**0.50**	**Medium/Average**
15	**I support the course/subject/curriculum by preparing websites/webpages and/or using useful and high-quality educational websites/webpages available on the Internet/web.**	**2.47**	**1.03**	**0.49**	**Medium/Average**
16	**I record the grades/scores of learners in the course/subject electronically.**	**2.46**	**1.02**	**0.49**	**Medium/Average**
17	**I am good at utilizing the modern ICT-based teaching and learning methodologies and strategies in my course/subject/curriculum.**	**2.45**	**0.98**	**0.49**	**Medium/Average**
18	**I use computers and/or smart devices to prepare/produce**	**2.44**	**0.97**	**0.49**	**Medium/Average**

	graphics, charts, illustrations, maps, infographics, and mind maps related to the course/subject/curriculum.				
19	**I transform the content of the course/subject/curriculum into simple and attractive electronic lessons using mind mapping software.**	**2.43**	**0.99**	**0.49**	**Medium/Average**
20	**I use computers and/or smart devices to analyze learners' grades/scores statistically.**	**2.43**	**1.00**	**0.49**	**Medium/Average**
21	**I convert the content of the course/subject/curriculum into simple and attractive electronic lessons using multimedia software.**	**2.42**	**0.95**	**0.48**	**Medium/Average**
22	**I am good at integrating/using educational software in teaching and learning.**	**2.39**	**0.94**	**0.48**	**Medium/Average**
23	**I am good at integrating/using ICT tools, apps, services, and resources in the course/subject/curriculum.**	**2.37**	**0.96**	**0.47**	**Medium/Average**
24	**I convert the content of the course/subject/curriculum into simple and attractive electronic lessons using presentations software.**	**2.36**	**0.93**	**0.47**	**Medium/Average**
25	**I use databases applications to store information and data.**	**2.36**	**0.93**	**0.47**	**Medium/Average**
26	**I support the course/subject/curriculum by using modern multimedia files such as graphics, audios, videos, animations, and others.**	**2.32**	**0.94**	**0.46**	**Medium/Average**
27	**I integrate computers and/or smart devices into teaching/learning through the use of digital/electronic resources.**	**2.30**	**0.95**	**0.46**	**Medium/Average**
28	**I prepare and print the tests using different software on computers and/or smart devices.**	**2.28**	**0.96**	**0.46**	**Medium/Average**
29	**I use computer and/or smart**	**2.26**	**0.95**	**0.45**	**Medium/Average**

	devices' applications for preparing lesson plans and in addition to daily, weekly, monthly, and periodical plans for the course/subject.				
	Weighted Average for Domain No. (3)	**2.49**	**0.90**	**0.50**	**Medium/Average**

The results for research question no. 2.

Research question no. 2 was stated as follows: Does the degree of availability of ICT competencies among teachers in general education schools in the State of Kuwait differ significantly in terms of gender, type of major (specialization), and teaching experience? In this study, several inferential statistics tests were applied to determine whether there were any significant differences among the inservice teachers' responses to the questionnaire (see Tables 8-10). Generally, the results indicate that the sociodemographic profile of the teachers did, indeed, influence the overall degree of availability of ICT competencies among them.

Table 8. The inferential statistics of the differences in the inservice teachers' responses to the domains of the ICT competencies questionnaire by gender.

No.	Domain/Component	Category	*N*	*M*	Std. Deviation	*t*	*df*	Sig. (2-tailed)
1	The basic competencies for using computers	Male	741	2.37	0.83	-6.617	1,297	0.000*
		Female	558	2.68	0.87			
2	The competencies of using the Internet/web resources	Male	741	2.24	0.81	-6.866	1,297	0.000*
		Female	558	2.56	0.85			
3	The competencies of using ICT tools into education (for teaching/learning & measurement/assessment)	Male	741	2.35	0.89	-6.462	1,297	0.000*
		Female	558	2.67	0.88			
	Overall domains/components (the instrument as a whole)	Male	741	2.32	0.81	-6.865	1,297	0.000*
		Female	558	2.64	0.85			

Note. * = The mean difference is significant at the 0.01 level ($\alpha \leq 0.01$).

Table 8 shows that there are statistically significant differences at the significance level of 0.01 between the average responses of male and female teachers in general

education schools—in favor of the female category—with regard to the degree of their possession of ICT competencies in all research's domains separately, and in the tool as a whole. This result can be explained by the fact that female teachers—although they represent about 43.0% of the total sample of the study—are more eager and enthusiastic to develop and enrich their abilities and their personal and professional knowledge in the field of ICT; thus, they practice the use and integration of ICT tools in their personal as well as professional lives more often than their male peers. It can also be elucidated according to the socio-cultural context that female teachers in general education schools may be higher academically and professionally competent—their foundation is solid—compared to their male peers, as they try to prove their competence and ability to compete with their male colleagues. In addition, female teachers in general education schools may be more serious, focused, and interested compared to males in the teaching and learning aspect.

A number of earlier research studies have shown similar results to this study, such as the following: (1) the study of Nimer and Al-Jarrah (2015) which showed that there are statistically significant differences in the average estimates of general education schools' teachers towards practicing educational ICT competencies due to the "gender" variable, in favor of female teachers; and (2) Safar's study (2021) whose findings revealed that there are statistically significant differences—at the significance level of 0.01—between the average responses of the faculty members regarding the degree of their possession of ICT competencies due to "gender" variable, in favor of the female category, in the vast majority of the study's domains separately, and in the research tool as a whole.

On the contrary, the results of other research studies indicated that there are no statistically significant differences in the average participants' estimates that were attributed to the variable of "gender", such as the following: (1) the study of Al-Qudah and Hamadnah (2012) which indicated that there are no statistically significant differences among the participants' responses due to the variable of "gender"; (2) Al-Maamari and Al-Masrouri's study (2013) which exhibited the absence of statistically significant differences between males and females participants in the research tool as a whole, and in all of the study's domains separately; (3) the study of Omar (2014) which also asserted that there are no statistically significant differences between the participants due to "gender" variable; (4) Al-Mohammed and Siam's study (2016) whose findings showed the

absence of statistically significant differences among the average scores of participants for the acquisition extent of their e-learning competencies that is attributed to the variable of "gender"; as well as (5) Gündüz's study (2020) which found that there are no statistically significant differences in the participants' responses depending on the variable of "gender".

Table 9. The inferential statistics of the differences in the inservice teachers' responses to the domains of the ICT competencies questionnaire by type of major.

No.	Domain/Component	Category	*N*	*M*	Std. Deviation	*t*	*df*	Sig. (2-tailed)
1	The basic competencies for using computers	AHSS	717	2.38	0.87	-5.689	1,297	0.000*
		Scientific	582	2.65	0.82			
2	The competencies of using the Internet/web resources	AHSS	717	2.24	0.83	-6.324	1,297	0.000*
		Scientific	582	2.53	0.82			
3	The competencies of using ICT tools into education (for teaching/learning & measurement/assessment)	AHSS	717	2.38	0.93	-4.668	1,297	0.000*
		Scientific	582	2.61	0.83			
	Overall domains/components (the instrument as a whole)	AHSS	717	2.34	0.85	-5.721	1,297	0.000*
		Scientific	582	2.60	0.80			

Note. * = The mean difference is significant at the 0.01 level (α ≤ 0.01).

It is noticed from Table 9 that there are statistically significant differences at the significance level of 0.01 between the average estimates of teachers with "AHSS" (i.e., arts, humanities, and social sciences) and "scientific" specializations in general education schools—in favor of the scientific disciplines category—with regard to the degree of their possession of ICT competencies in all of the research study's domains separately, and in the research tool as a whole. Statistically, although the proportion of the sample with a science major 44.8% is lower than the proportion with a literature (AHSS) major 55.2%, the level of cognitive abilities of teachers in general education schools with scientific specializations in the field of ICT is higher compared to their peers with literary (AHSS) specializations due to the nature and requirements of their studies, work, and specializations which require dealing more frequently with ICT's media, tools, services, apps, systems, platforms, resources

and networks; therefore they can carry out their roles, tasks, responsibilities, and personal and professional duties to the fullest.

The results of the current study are consistent with the findings of the Safar's (2021) study which revealed that there are statistically significant differences—at the significance level of 0.01—between the average responses of faculty members regarding the degree of their possession of ICT competencies due to the variable of "specialization" and in favor of the category of "scientific" specializations, in the vast majority of the study's domains, and in the research instrument as a whole. Yet, the results of the current study differed from the findings of other research studies, such as the Elagrami's study (2012) and the Al-Maamari and Al-Masrouri's study (2013) which both showed the absence of statistically significant differences between the participants responses according to the variable of "specialization".

Table 10. The inferential statistics of the differences in the inservice teachers' responses to the domains of the ICT competencies questionnaire by years of professional experience.

No.	Domain/Component	Category	*N*	*M*	Std. Deviation	*t*	*df*	Sig. (2-tailed)
1	The basic competencies for using computers	< 10 years	414	2.65	0.93	4.126	1,297	0.000*
		> 10 years	885	2.44	0.82			
2	The competencies of using the Internet/web resources	< 10 years	414	2.50	0.87	3.578	1,297	0.000*
		> 10 years	885	2.32	0.82			
3	The competencies of using ICT tools into education (for teaching/learning & measurement/assessment)	< 10 years	414	2.62	0.89	3.605	1,297	0.000*
		> 10 years	885	2.42	0.89			
	Overall domains/components (the instrument as a whole)	< 10 years	414	2.59	0.86	3.891	1,297	0.000*
		> 10 years	885	2.39	0.82			

Note. * = The mean difference is significant at the 0.01 level ($\alpha \leq 0.01$).

The results of the analysis shown in Table 10 revealed that there are statistically significant differences in the average responses of the study's sample with regard to the degree of their possession of ICT competencies based on the variable "years of professional experience", in all three research's domains separately, and in the

research tool as a whole. The findings of the analysis showed the presence of these statistically significant differences among the participants at the significance level of 0.01, and that they are always in favor of the group with fewer years of professional experience (less than 10 years). This is a natural and logical result; in terms of the "duration of usage" for general education schools' teachers with less than 10 years of experience (i.e., digital natives) for different educational ICT's media, tools, apps, platforms, services, resources, and networks—whether in their professional or personal lives—, they are considered relatively higher compared to those of their counterparts with higher years of professional experience, more than 10 years (i.e., digital immigrants). This result can also be interpreted according to the statistical context that despite the small size of the participating sample of teachers in general education schools in the category with less years of professional experience (less than 10 years), which amounted to 414 participants (approximately 31.9%), their degree of availability/acquisition of the ICT competencies—the basic competencies for using computers, the competencies of using the Internet/web resources, and the competencies of using ICT tools into education (for teaching/learning & measurement/assessment)—is much higher than the participating sample with the highest years of teaching experience (more than 10 years) who were 885 participants (about 68.1%), which is twice the size of the participating sample for the category of teachers with fewer years of experience (less than 10 years).

Several previous research studies showed similar results to the current study, such as the study of Al-Qudah and Hamadnah (2012) as well as Omar's study (2014) which both confirmed that there are no statistically significant differences between the participants' responses to their extent of acquisition of ICT competencies due to the variability of professional/teaching experience. Other studies partially asserted the same findings, such as the following examples: (1) the study of Al-Maamari and Al-Masrouri (2013) whose findings revealed that there are no statistically significant differences between the levels of teaching experience in the research tool as a whole, and in most of its domains, except for the core competencies of computer operation in which statistically significant differences in teachers' responses appeared in favor of teachers with less teaching experience, (1 to 10 years) category; and (2) Elagrami's study (2012) which also did not indicate the presence of statistically significant differences in the degree of availability of ICT competencies among the participants' responses based on the variable "years of experience" while significant differences attributed to the variable of "the educational stage/level" were present in all of the research study's domains, with

the exception of the domain of "basics of computer use", and was in favor of those with higher teaching experience (5 years or more). Statistically significant differences were found in the rest of the study's domains (i.e., network services, e-courses design and development, and e-courses management) and the research tool as a whole, for the benefit of the most teaching experience.

On the contrary, the findings of other research studies indicated that there are statistically significant differences among the participants' overall responses according to the variable "years of professional experiences", such as the following studies: (1) the study of Al-Mohammed and Siam (2016) whose results found statistically significant differences in the average estimates of the participants according to the variable "years of experience", in favor of higher teaching experience (from 5 to 15 years) in the study's tool as a whole, and in the field of e-learning knowledge; as well as (2) Safar's study (2021) which revealed statistically significant differences, at the significance level of 0.01, between the average responses of faculty members with regard to "years of professional experience" variable (in favor of the group with higher years of teaching experience, more than 10 years), in the vast majority of the study's domains separately, and in the research instrument as a whole.

Recommendations

In light of the results of the current study, the researchers can make the following recommendations:

1. Giving great consideration to the process of professional development and training for inservice teachers in general education schools in the State of Kuwait, with the need for a comprehensive reform in this area, especially in the field of ICT. This reform is done by holding periodic specialized training courses/programs in this field—administered by the training centers affiliated with the Ministry of Education—because the training programs have a great role to play in providing and developing the necessary ICT skills and competencies for teachers in general education schools in order to reach digital empowerment, while ensuring that these training courses focus on those skills and competencies that inservice teachers in general education schools still need to acquire and/or develop.

2. Encouraging teachers in general education schools to join training courses and specialized workshops about using/integrating ICT tools, applications, systems,

platforms, networks, services, and resources in their teaching and learning processes.

3. Providing moral and material incentives—such as certificates, appreciation awards, grants, and financial rewards—to teachers in general education schools in the State of Kuwait in order to encourage them to integrate the various ICT media (i.e., tools, apps, systems, platforms, networks, services, and digital resources) in the teaching and learning processes.

4. Motivating national human cadres who are specialists in the field of ICT to participate and actively engage in enriching scientific research in this vital field in general, and in the topic of ICT competencies/standards specifically.

5. Benefiting from the study's instrument so that it becomes a guide for educational officials, curriculum developers, teachers, researchers, and all those interested in using/integrating technology into education (i.e., teaching and learning), to measure the extent to which educators of all categories possess the necessary ICT competencies/standards (i.e., their availability/acquisition degree/extent).

6. Undertaking the latest developments in the field of integrating ICT tools, applications, systems, platforms, services, networks, and resources in education, and specifically in distance teaching/learning and/or electronic teaching/learning in educational institutions. These developments can be accomplished through reviewing specialized scientific journals/periodicals, and attending various events such as conferences, symposiums/seminars, forums, panel discussions, workshops, and relevant local, regional, and international training courses/programs.

7. Urging the Ministry of Education leadership to expand the establishment of educational (i.e., teaching/learning) digital resources centers in schools in all the different educational areas/districts in the State of Kuwait, and to provide all it needs in terms of educational and technical cadres, hardware, software, teaching and learning digital/electronic materials, and others in order to move towards digital empowerment, and ultimately achieve the desired digital transformation goal.

8. Professional accountability of teachers, technical supervisors, and educational administrators for their role in integrating the twenty-first century digital/ICT skills and competencies within the school curricula.

9. That the suggestions and recommendations emanating from this study be translated into visions, policies, strategies, action plans, and effective professional educational practices in the educational field in the State of Kuwait; so that we can reap its benefits as quickly as possible, especially in light of the educational

repercussions that accompanied the crisis of the outbreak of the emerging Coronavirus (COVID-19) pandemic.

10. Conducting more scientific research studies similar to the current study and related to the extent to which human resources in the public and private educational sector possess ICT competencies and their relationship to other variables not addressed in the current study, to include a larger number of participants from different categories affiliated with educational institutions in the State of Kuwait, whether in basic (i.e., PreK-12) or higher education institutions (public and private).

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