جـــامـعـــة الـــشـرق الأوسـط
MIDDLE EAST UNIVERSITY
Amman - Jordan

Evaluate the Digital Competence in the Jordanian Private Schools in Light of the European Digital Competence Framework Approach

تقييم الكفاءة التقنية في حدود الإطار الأوروبي والمعايير المطبقة في المدارس الخاصة في الأردن

Prepared by:
Hala Ali AbouJabal

Supervised by:
Dr. Mohd Habib Samkari

This Thesis Was Submitted In Fulfillment Of the Requirement for the Master's Degree in Information and Communication Technology in Education

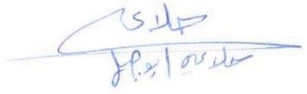
Department of Special Education and Educational Technology
College of Art & Educational Sciences
Middle East University
Jan. 2023

Authorization

I am **Hala Ali Ahmad AbouJabal**, authorize Middle East University to provide libraries, organizations, and individuals with copies of my thesis upon request.

Name Hala Ali Ahmad Aboujabal

Date: 16 / 01 / 2023.

Signature: 

Thesis Committee Decision

This thesis: "**Evaluating the Digital Competence in the Jordanian Private Schools in Light of the European Digital Competence Framework Approach**" was successfully defended and approved in 16/1/2023.

Examination Committee signature:

1	Dr. Mohammed Habib Samkari	Middle East University	Supervisor	Signature:
2	Dr. Khaleel Mahmoud AlSaid	Middle East University	Internal Examiner	Signature:
3	Dr. Manal Ata Altawalbeh	Middle East University	Internal Examiner	Signature:
4	Prof. Muhannad Anwar Al-Shboul	University of Jordan	External Examiner	Signature

Acknowledgment

I feel grateful to Allah the Almighty whose blessings overwhelm me. I owe thanks to many people for their help, advice, wisdom, and support through each step of this work.

I am sincerely thankful to my supervisor Dr. Mohammad Habib Samkari for his guidance, understanding, patience, and most importantly, his friendship during my graduate studies as he guided me along my educational endeavor. He was insightful and resourceful in a way that benefited my study. Also, He deployed his experience for the favor of my research. Many thanks to the committee examiners, Professor Muhannad Al-Shboul, Dr. Manal Altawalbeh and Dr Khaleel AlSaid. I am indebted to Dr. Hamzeh Alassaf and Dr. Shereen Abuhait for their help and support.

My appreciation also goes to the participants at the International Independent School.

I greatly appreciate the assistance of the founder of the International Independent School, Mr.Nabeel Hussien, and the General manager Dr.Ammar Alnawaiseh who supported me throughout my educational journey .Finally I would like to extend my gratitude and appreciation to Prof.Dr.Anees Almansour for his endless support .

The Researcher

Hala A. AbouJabal

Dedication

This study is wholeheartedly dedicated to my mother's soul and my beloved father, who have been my source of inspiration and gave me strength when I thought of giving up, who continually provide their moral, spiritual, emotional, and financial support.

To my sister thank you for your everlasting love and warm encouragement throughout my research.

To my brothers, and friends, and classmates who shared their words of advice and encouragement to finish this study.

To my family, they have always believed in me and supported me in seeking my ambitions to be the person I am today.

Thank you,,

Table of Contents

List of Tables

List of Figures

List of Appendices

Evaluate the Digital Competence in the Jordanian Private Schools in Light of the European Digital Competence Framework Approach

Prepared by: Hala A. Abu Jabal
Supervised by: Dr. Mohd. Habib Samkari

Abstract

This study aimed to evaluate the teachers who work at the International Independent School, ranging from first to twelfth grades regarding the level of competency required for the implementation of technology in their classrooms.

The methodology used in this study is descriptive-quantitative method using a cross-sectional survey design and a scale of 5-point Likert type.

The results revealed that the convenience sample 123 teachers. According to the feedback provided by the sample instructors, the overall competence degree represented a high level of competency in Professional Engagement, Digital Resources, Teaching and Learning, Assessment Using digital technology, Empowering Learners, and Facilitating Learners Digital Competence. It was discovered that there is not a substantial relationship between the Qualification, Major, and years of experience toward digital competence as the values were greater than (0.05). In terms of their perception of the level of expertise required to adopt technology, teachers who had the highest experience showed slight more competence as opposed to other teachers. Teachers who hold undergraduate degrees were more digitally competence to those who hold graduate degrees. In terms of major, teachers who teach humanities showed gradually digital competence as compared to those who teach sciences. Finally, teachers who are their thirty-one to thirty-nine scored the highest mean of perceptions of competency toward implementing technology in classrooms when it came to the implementation of technology in classrooms. In terms of the contribution of teaching experience to digital competence, it is clear that teachers who had more years of experience are more digitally competent.

The study Recommendations for pedagogical purposes were that the sample for future research may include parents and teachers along with students to study all the domains that can affect students and learning environments and their pedagogical Behaviors in relation to technology, and to address the students' needs and their digital Abilities.

Keywords: Digital Competence, European Digital Competence Framework, Jordanian Private Schools.

تقييم الكفاءة التقنية في حدود الإطار الأوروبي والمعايير المطبقة في المدارس الخاصة في الأردن

إعداد: حلا علي أبو جبل

إشراف: الدكتور محمد حبيب السمكري

الملخّص

هدفت هذه الدّراسة إلى تقييم الكفاءة التّقنيّة عند المعلّمين من وجهة نظرهم في حدود محاور ومعايير الإطار الأوروبيّ للكفاءة الرقمية. حيث أجريت في مدارس القطاع الخاصّ في الأردن/ عمّان في العام الدّراسيّ 2023/2022،وتمّ استخدام منهج المسح الوصفيّ للحصول على البيانات، وإعداد إستبانة لقياس المعايير المطبّقة بناءً على محاور الأوروبيّ للكفاءة الرّقميّة، وتكوّنت عيّنة الدّراسة من (123) معلّمًا ومعلّمةً، وبيّنت النّتائج أنّه لا توجد علاقة بين العمر والجنس والخبرة والمجالات الأكاديميّة ومستوى التّعليم والمواقف اتجاه الكفاءة الرّقمية، أمّا من حيث مستوى الخبرة المطلوبة لتبني التّكنولوجيا، حيث أظهرت نتائج هذه الدّراسة أنّ المعلّمين الّذين لديهم خبرة أعلى يستخدمون التّكنولوجيا بشكل أكثر من المعلّمين الآخرين، كما بيّنت أن مستوى الإدراك لتطبيق التّكنولوجيا دون تفعيلها كان أعلى لدى المعلّمين الّذين تتراوح أعمارهم بين 31–39، وكما أظهرت النّتائج أن المعلّمين الّذين لديهم خبرة من 1– 5 سنوات لديهم معرفة رقميّة أعلى من المعلّمين الّذين لديهم خبرة من 6 –10 سنوات، وأوصت الدّراسة مجموعة من التّوصيّات من أبرزها: إجراء دراسات مستقبلة على فئات أخرى من المؤسّسات التّعليميّة، وقياس الكفاءة الرّقميّة عند أولياء الأمور.

الكلمات المفتاحية: الكفاءة الرقمية، الإطار الأوروبي للكفاءة الرقمية، المدارس الخاصة الأردنية.

CHAPTER ONE

Background and Significance of the Study

This section includes seven sections; the first is a brief introduction about digital competence, the statement of the problem, the two questions of the study, the aims and objectives of the research, the significance and the limitations of the study, and the definition of the key term.

1.1 Introduction

Recent years have been particularly fruitful for Jordan's information and communications technology (ICT) industry, which has benefited from rising public and private sector investment and employment. The many sectors of the economy, society, and the educational system have all felt the effects of the rapid pace of technological growth.

The Ministry of Education (MoE) has gone above and above in its attempts to incorporate ICT in schools; for example, it has installed computer labs in public schools, complete with PCs, Internet connections, and other necessary hardware like printers, scanners, and data projectors. (Al-Zaidiyeen, & Fook, 2010).

The rapid spread of digital technologies has dramatically altered nearly every facet of our lives, from the ways in which we communicate and work to the ways in which we enjoy leisure time, organize our lives, and gain access to knowledge and information. The way we feel and act as a result of it has shifted, Kids today are growing up in a world where digital technology are pervasive, they have no way of knowing any different, But it doesn't guarantee they have the requisite competence to utilize digital tools responsibly and productively (Chien, 2012)

Both national and European policy recognize the importance of providing all individuals with the skills necessary to critically and creatively utilize digital technology, As a result, the European Union updated the European Digital Competence Framework (DigComp) in 2016–2017 to provide a framework that helps Europeans define and improve their digital skills. (Redecker& Punie 2017).

Numerous initiatives at the European, national, and regional levels provide recommendations and advice on how to assist young people to build their digital competence, frequently with a focus on critical skills and digital citizenship, for students and learners in compulsory education. (Tornero& Tejedor & Fernández 2010).

Most European Union member states have already implemented or are in the process of implementing curricular changes to better prepare the next generation to actively contribute to and benefit from the information and communication technologies that make up today's modern world. (Semerci, 2018) , (Cabero Almenara, 2019).

As a result, there is a strong push at the global, European, national, and regional levels to provide educators with the skills they need to fully utilize the benefits of digital tools in the classroom and better prepare their students for success in today's information-based economy. Frameworks, self-assessment tools, and training programs to direct teacher training and Continuing Professional Development in this area have been developed or are being revised by many European Member States (Caena& Redecker 2019).

Students are inspired to develop their reasoning and communication skills, as well as their imagination and initiative, when they have access to tools and information outside the classroom. Proper use of technology in the classroom helps students develop motivation of learning by introducing them to a variety of instructional approaches that appeal to their individual learning styles, whether they learn best by using visual and

audio cues or kinesthetic (Bishop et al., 2020). The widespread use of Information and communication technology in educational settings is responsible for at least some of the profound changes which have recently occurred in the sector; however, training programs have not always accompanied this presence, regardless of educational level as stated in Rodriguez, Mireia , Cantabrana, Jose, and Cervera and Merce (2018). Teachers' lack of ICT training is not due to a lack of enthusiasm for the subject, but to a lack of institutional endorsement, time, resources, and training programs (Mrquez; Leiva-Olivencia&Lpez-Meneses, 2018). However, when training has been provided, it has been provided via models that place more emphasis on instrumental and technical components than pedagogical and didactic ones (Semerci, 2018) , (Cabero Almenara, 2019).

In an effort to make the best use of technological innovation, governments worldwide are exploring viable strategies for activating and involving technological methods across all sectors, with education being one of the main focuses. Many nations hope to improve and upgrade their educational systems in the future (Hazar& Esin, 2019).

As a result, new ideas have emerged, such as "Digital Teaching Competence" (DTC), which goes beyond simple technical know-how to embrace a broader set of skills related to the effective use of digital tools in the classroom, the European Union (2018) identifies this concept as a crucial skill for all members of society and for educators in particular to have in the Knowledge Society. (Cefai,Bartolo, Cavioni, & Downes 2018). What was meant by "equitable use of technology" is that all students, regardless of their background, socioeconomic standing, race, gender orientation, ability, age, or any other distinguishing factor have equal access to and use of information resources. Opportunities for learning are enhanced by technology, and it is also fundamental in helping students acquire the expertise necessary to participate responsibly in the digital world. If kids can't get their

hands on the resources they need to succeed, they may be held back in life. Fair distribution requires giving all students access to cutting-edge instructional materials and instructors (Guitert, Romeu & Baztá, 2021)

For a variety of reasons, educators are increasingly incorporating technological elements into their lesson plans, to inspire learners, provide novel techniques, and boost output. The utilization of technology in teaching is essential, and it must be readily available. Proper planning is essential for a smooth transition into incorporating technology into the classroom. Technology may be incorporated into a curriculum to improve the efficacy, efficiency, and manageability of teaching and learning in certain subject areas. Including technological considerations in curriculum design may help in creating innovative approaches to address common challenges in the classroom and open up meaningful avenues for student discourse (Kelentri, Helland, & Arstorp, 2017). Learning management systems have been employed by both the public and private sectors in Jordan to equip the tools and softwares of information technology for the use of digital technologies in classrooms, notably during the COVID-19 Pandemic. Therefore, new criteria for what students should be able to achieve should be created to replace the outdated emphasis on fundamental knowledge and abilities. To meet this challenge, education must be redesigned such that students acquire the critical thinking, problem-solving agility, and interpersonal and communication skills required for professional and personal success. A new approach to educational standards and evaluation is one of the most essential tools for bringing about this transformation. (Griffin & Care, 2014).

According to (Vuorikari, Punie, Carretero, and Brande, 2016), European Commission issued the (Digital Competence Framework) for Citizens, or (DigComp), for the first time in 2013. The purpose of the framework was to aid in the development of policies that

encourage digital competence and the planning of education and training efforts targeted at improving the level of digital literacy among certain populations. DigComp also supplied a common reference at the European level by standardizing the vocabulary used to define and characterize the major domains of digital competence, and it has experienced extensive application in a variety of settings, most notably those associated with professional development, formal education, and continuing education.

According to European Commission (2016), teachers are aware of that it is beneficial for students to have the capability to operate digitally and, more crucially, the ability to create a compelling narrative about their digital abilities in order to begin their careers. Students get guidance and support as they navigate the transition from school to career planning via participation in the Digital Competencies Program. Students are able to identify opportunities to build their digital competencies within the curriculum as well as outside of it by utilizing a framework of skills that range from fundamental computer survival skills all the way up to advanced techniques in data, digital communication, and critical thinking . The purpose of the Digital Competence Framework is to assist students in determining the digital skills and critical perspectives that will be necessary for them to become leaders in the 21st century, as well as in locating opportunities within their curricula and extracurricular activities to refine those skills and perspectives. In addition to , it is assists students in developing methods of expressing and presenting their abilities to a variety of audiences. The framework may also assist educators. in identifying current possibilities to acquire digital competences via curricular and co-curricular activities, and it can assist with the thoughtful incorporation of such chances into new courses and programs.

1.2 Statement of the Problem

The necessity for innovative strategies to integrate technology into the classroom has arisen as the digitalization of society has increased the requirement for teachers who are themselves well-versed in the digital realm. This integration is seen as most appropriate to begin in teacher education (Kay, 2006), However, recent research indicates that there is a mismatch between the digital demands that newly certified teachers face in the workplace and the training in instructional technology provided during teacher education. (Gudmundsdottir, Loftagarden, & Ottestad, 2014). To be able to integrate and utilize technology for educational purposes, one must possess a set of general abilities applicable to all contexts, both personal and professional, as well as teaching-specific talents. This is referred to as teachers' professional digital competence. (Lund, Furberg, Bakken, & Engelien, 2014).

1.3 Questions of the Study

This study is therefore concerned with the following questions:

1. *What is the digital competence the educators have?*
2. *Does the degree of possession of digital competencies in teaching vary according to the following variables gender, age, qualifications, major and expertise of the teachers?*

1.4 Objectives

The main focus of this study is on the educator's digital competency and how it affects using technological tools in the classroom. After the COVID-19 pandemic, enhanced technology in the classrooms has become a must, therefor the Jordanian government has tried to facilitate the use of technology.

Since it is not a standardized process but rather relies on the skills of both students and teachers, there should be a set of standards that are implemented within a specified framework because how technology is employed differs from one school to another. To do this, the European Digital Competence Framework for Educators (DigCompEdu), which is accepted by all member states of the European Union as a valid way to measure technical skills, will be used to measure the educators' digital competence and the effect of different demographic variables on it.

1.5 Significance of the Study

This study is important research in the field of digital competency among educators However, the significance of this study comes from its aim, which is to evaluating the Digital Competence in the Jordanian Private Schools in Light of the European Digital Competence Framework Approach

Most Jordanian research studies have focused on the use of digital resources in the classrooms Therefore, this study attempts to fill a key gap in the literature, proposing a framework to gather essential data that allows an emphasis on the areas where the hindrances mainly lie and how they can be resolved in Jordan Private schools. This framework helps teachers and students interact, communicate, and work together using digital tools while respecting and learning from differences in background knowledge, experience, and perspective to take part in public and commercial digital services and active citizenship in order to contribute to society.

The findings of this study might assist the decision makers at the Ministry of Education in making informed decisions regarding the training and development of educator's digital competency which will gain maximum benefit for students/learners and to support the educational process in Jordan at Private schools sector

The theoretical and practical background that there is a strong urge for new types of instruction that promote students' capacity building, including the ability to utilize technology to cultivate critical thinking, problem-solving, and communication skills

(Saavedra & Opfer, 2012). Despite the fact that many schools have access to computers and the requisite technology infrastructure, the pedagogical application of instructional technology differs. (European Commission, 2013).

Moreover, this framework is effective as it finds solutions by figuring out what educators want and need, fixing conceptual and real-world issues in digital settings, improving methods through using digital resources, and following the rapid developments in digital technology. Ala-Mutka, K. (2011).

Teacher competency frameworks, in defining the needs of educators, may be useful in a variety of contexts and settings. When used at the classroom level, it may aid in teachers' daily work and help them grow professionally. School districts may benefit from it at the level of local education governance by having a stable foundation upon which to build learning organizations that foster open communication, cooperation, and introspection among educators. At the systemic level, it may serve as a set of benchmarks for the quality of pre-service and in-service training for educators. Integrating

1.6 Limitations of the Study

Due to the small size of the population chosen in this research which comprises ofone private school, including 123 teachers, the findings of this research cannot be generalized beyond the selected sample. The findings will be limited to the setting and instruments used in the current study as it was conducted in the International Independent School in the first semester of the academic year 2022/2023.

1.7 Definitions of Terms

The below definitions tackle the scope and sequence of Digital Competence and its framework.

- **Private Schools:**

The schools that are independent in terms of their finances and governance. They are also called privately financed or non-government schools (Zaidi, 2011).

Procedurally, are privately owned schools in Amman connected with the Directorate of Private Education in Jordan?

- **Digital Competence:**

Jenkins et al. (2006) defines the Digital Competences as skills that enable participation in the new communities emerging within a networked society.

Procedurally, It is defined as the set of knowledge, skills, and attitudes that educators should acquire in order to use ICT and digital media critically and creatively for the purpose of achieving goals linked to work, learning, and/or leisure

- **Dig Comp Framework**

It is a scientifically sound background framework which helps to guide policy and can be directly adapted to implementing regional and national tools and training programmers. In addition, it provides a common language and approach that will help the dialogue and exchange of best practices across borders (Redecker, 2017).

Procedurally, It is defined as a framework that offers a standardized methodology that can facilitate communication and the sharing of best practices.

According to the European Commission (2016), the DigComp framework focuses on five domains. Below is a breakdown of the sections:

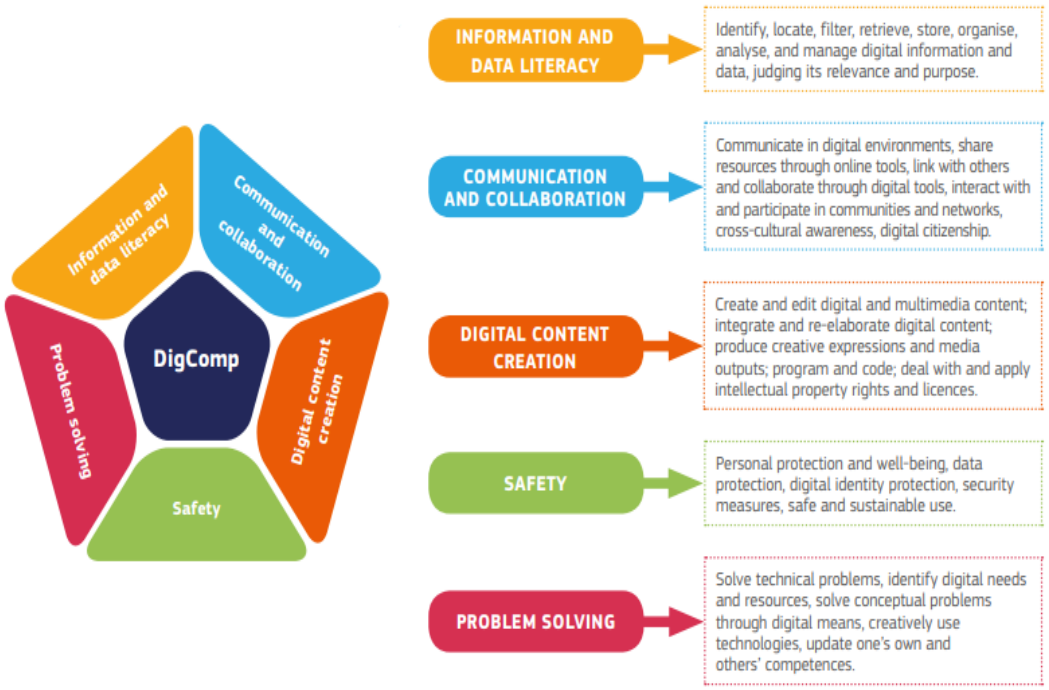


FIGURE 1: DigComp outlines the 5 key areas of digital competence (Redecker, 2017)

CHAPTER TWO
Literature Review and Previous Studies

This section constitutes two subsections; the first is a brief review of theoretical studies proposed by the scholars of digital competence, and the second section is a brief review of some related empirical studies that have been conducted.

2.1 Review of Theoretical Literature

Learning-based technology plays a major role in the educational process by improving the level of teaching, learning and developing critical thinking. DigComps are Internet-based applications that are used to prepare, present and implement learning activities for students, directly or distancing based learning. Typically, DigComp provides the teacher with tools to create and present content, monitor student participation, and assist their performance (Lai & Savage, 2013). Besides, DigComp can provide students with the ability to use interactive features, such as topic discussion, video meetings, and discussion forums (Evangelinos & Holley, 2015).

2.1.1 E-Learning

The steady technological progress, and the widespread of technological innovations, have made educational institutions think and reconsider their curricula to keep pace with the era of Information and Communication Technology (ICT) revaluation. This approach assured the unparalleled sharing of knowledge, and has encouraged educational institutions to prepare a generation capable of adapting to the modernity of the ICT. (Swarts, 2020).

E-learning is a modern learning style based on ICT. Therefore, specialists develop software to help the Learner to gain knowledge by providing the necessary facts about a

particular phenomenon or problem. E-learning offers a variety of ways to provide information; for instance, students can read texts, examine images, and listen to explanations to the point of interacting with the system. This leads to an improvement in information retention as individuals remember 10% of what they read, 20% of what they see, and 40% of what they see and hear (Brown & Palincsar, 2018).

The DigComp supports the effective use of various e-learning tools and the delivery of educational content to learners. It is designed to transcend the boundaries of time and space in an interactive way. In addition, it is able to provide an environment that positively reflects on the learners, and it allows teachers to easily manage and supervise the educational process. (Al-Otaibi, 2019; Peter & Shane 2016). However, the style of e-learning differs according to the purpose, or devices used, as (Al-Halawi, 2009) pointed out there are two main types: synchronous or asynchronous e-learning.

Teachers, in general, have a heavy burden of obligation to devise methods through which students can grasp ideas and acquire thorough knowledge. This is because understanding the importance of scientific concepts is fundamental to the development of scientific knowledge, and the meaningful formulation of this understanding is crucial to the progress of human knowledge. (Al-Khateiba & Al-Arimi, 2003). Therefore, it can be noted that learning a subject, in particular, requires giving students the opportunity to build their understanding and acquire scientific thinking skills, and thus build their own knowledge (Meyer & Coyle, 2017).

The relationship between educational technology and the development of e-learning systems for chemistry learning depends on the development of the DigComp itself, e-content, as the success of its application is based on the experiences gained by chemistry teachers in the development of relevant digital technology; for example, educational bags.

In addition, the relationship between was limited to directing students and teachers towards accepting technological change. On the other hand, attention should be paid to the ability of the school administration to develop its vision and implementation in managing e-learning systems for chemistry teachers in different educational stages. (Coyle & Connor, 2017).

Therefore, in order to ensure the success of the experiment based on accepting factors of technological change, students and teachers alike must be trained in the use of ICT in the educational process. This can be achieved by restructuring the teaching methods that support their experiences in using e-learning. (Jhurree, 2005).

Therefore, integrated e-learning systems should be developed in which all elements of the educational process are shared by teachers, students, parents and school management. However, most of the studies have dropped (Technology Acceptance Model) and its elements in measuring students' acceptance of new technologies. These elements, like the benefits, ease of use of computer skills, are important factors for the acceptance of e-learning (Khorasani, Abdolmaleki, and Zahedi, 2012; Fathema, Shannon, and Ross, 2015).

2.1.2 Academic Achievement

The concept of student achievement refers to the extent to which students achieve their learning outcomes as a result of a particular educational experience. This reveals the students' progress towards certain goals (Zaytoun, 2001).

Therefore, the level of student achievement is one of the most important educational topics, which measures the extent to which the learning outcomes are achieved. The interest in measuring student achievement has increased, especially with the increased accountability of class teachers in light of the comprehensive quality control standards

that govern the educational process. In summary, the teacher's ultimate goal is to improve students' academic achievements, and they prepare them for the next stage. (Creemer & Kyriakides, 2006).

Many factors affect student or school achievement; at the student level, these factors include geographic location, family background, learning attitudes, motivation, and personality. At the school level, the factors include infrastructure, location, school size, number and diversity of students, as well as the level of teachers, such as vocational training, education attitudes, and motivations and cooperation. It should also be noted that educational achievement standards can be influenced by the country's education policy. (Inan & Lowther, 2010).

It is obvious that teachers are of great importance in creating a good learning environment, developing students' abilities and motivating them towards learning, and improving student achievement in school (Alenezi, 2020). This is consistent with R. McKinsey's first report, which noted that a quality education system depends on teachers who realize that successful learning is inconceivable without quality learning.

2.1.3 Educational Quality

Teachers' contributions can only be judged based on how well each student does. If improved academic achievement of the student and the school is one of the factors that can be affected by educational policy, then quality, number of teachers, and equal opportunity are the two most important factors. (Erlia, 2021).

In pedagogy, the education quality, achievement, and teacher quality comprise complex components and a closely related level through observable and measurable traits, as well as items that cannot be observed or observed indirectly; accordingly, student achievement can be linked to educational practices and situations designed to more

effectively develop students' cognitive and inferential abilities. However, this requires teachers to adopt appropriate educational situations to build knowledge rather than simply impart it (Dobre, 2015).

In line with technological developments and their uses in the learning process, efforts have emerged to explore innovative and effective teaching tools and methods in managing educational situations. (Johnson, Jacovina, Russell & Soto 2016).

DigComp is based on modern technologies is an assistive learning model that has received a lot of attention in recent years (Garrote and Pettersson, 2012). DigComp has provided an opportunity to help teachers and students achieve higher levels of learning goals (e.g. problem-solving skills and critical thinking (Adnot, 2017). However, their adoption may require different settings and specifications to achieve desired outcomes and promote active student participation (Zitter et al, 2012). Although learning management systems are used in developed countries, they are quite new and innovative in developing countries (Mijatovic et al, 2013).

The use of E-learning should lead to learner and teacher satisfaction, improved knowledge, self-awareness and understanding of concepts, and achievement of curriculum aim and objectives (Mijatović et al., 2013). Therefore, when learning management systems are used in conjunction with traditional learning, this new paradigm is often called blended learning (Barnar, 2009). Furthermore, the positive effects of blended learning, a high degree of acceptance by students and teachers, as well as the positive impact of blended learning on student achievement. However, the operationalization and use of DigComp requires a significant investment in time, planning and specialized resources, as well as acceptance. This enables an environment that allows

students to interact collaboratively as an independent party, or it can be used in addition to teaching in traditional classrooms (Adnot, 2017).

2.1.4 Educational Technology

The relationship between educational technology and the development of e-learning systems for learning science depends on the development of the DigComp itself, e-content, as the success of its application is based on the experiences gained by Science teachers in the development of relevant digital technology , On the other hand, attention should be paid to the ability of the school administration to develop its vision and implementation in managing e-learning systems for subject teachers in different educational stages. Therefore, in order to ensure the success of the experiment based on accepting factors of technological change, students and teachers alike must be trained in the use of ICT in the educational process. This can be achieved by restructuring the teaching methods that support their experiences in using e-learning. (Kuzminska, Mazorchuk, Morze, Pavlenko, & Prokhorov, 2019).

Therefore, integrated e-learning systems should be developed in which all elements of the educational process are shared by teachers, students, parents and school management. However, most of the studies have dropped TAM and its elements in measuring students' acceptance of new technologies. These elements, like the benefits, ease of use of computer skills, are important factors for the acceptance of e-learning (Khorasani, Abdolmaleki, and Zahedi, 2012; Fathema, Shannon, and Ross, 2015).

2.1.5 Digital Competence-based Education

The incorporation of digital technology is a sign of development that may be attributed to its status as a component of the Knowledge Society. Along these same lines, a variety of institutions recognize the significance of teaching digital skills by putting

forth various methods and conceptual frameworks. In them, the information and abilities that instructors need to acquire are categorized, integrating technical, professional, organizational, and pedagogical competencies, with various dimensions and descriptions. (Hepp,, Hinostroza, Laval & Rehbein, .2004).

Various organizations and institutes have identified various metrics or standards for describing teacher digital competence. (Muñoz-Repiso, Martín, & Gómez-Pablos, 2020). These categorize the skills and knowledge that educators are expected to acquire along a variety of dimensions and labels. This book compiles the authors' opinions on the most widely-used terms in the global setting. (Cabero-Almenara & Palacios-Rodríguez, 2019; Cabero-Almenara & Gimeno, 2019; Padilla-Hernández, Gámiz-Sánchez, & Romero-López, 2019; Prendes & Gutiérrez, 2013; Rodríguez, Méndez, & Martín, 2018; Lázaro-Cantabrana, Usart-Rodríguez, & Gisbert-Cervera, 2019; Silva, Morales, Lázaro, & Gisbert, 2019)

European Framework of Digital Competence for Teachers DigCompEdu (M1)

The Joint Research Centre of the European Union (JRC) released DigCompEdu in late 2017. (Redecker & Punie, 2017). Its primary goal is to connect European educational policies with this reference framework. Furthermore, it is a compilation of scientific investigations conducted at the local, national, European, and international levels (Ghomi & Redecker, 2018; Redecker & Punie, 2017). DigCompEdu is a digital competence paradigm with six distinct competencies (Figure 1). Each domain contains a set of abilities that "teachers must possess in order to support effective, inclusive, and innovative learning practices through the use of digital resources" (Redecker y Punie, 2017, p. 4).

ISTE standards for Teachers (M2)

The International Society for Technology in Education creates this competency framework with a focus on the demands of 21st century students (Crompton, 2017). Its primary goal is to delve into teaching practice, foster student collaboration, rethink old methodologies, and increase independent learning (Crompton, 2017; ISTE, 2018; Pérez-Escoda, Garca-Ruiz, & Aguaded, 2019). The general teacher profile is distinguished by active and innovative participation in the teaching-learning process (Gutiérrez-Castillo, Cabero-Almenara, & Estrada-Vidal, 2017). As a result, the ISTE criteria for teachers are separated into seven roles or profiles that a teacher must acquire over the course of his or her professional career.

UNESCO ICT Competence Framework for Teachers (ICT-CFT) (M3)

UNESCO created this framework to show "a wide range of competences that teachers require in order to integrate ICT in their professional activity" (Butcher, 2019, p. 2). It promotes practical knowledge of the benefits of ICT in educational systems. Furthermore, it implies that, in addition to learning ICT competences, instructors must be able to use them to assist their students in becoming collaborative, creative, inventive, devoted, and decisive citizens (Rodrguez et al., 2018).

Common Spanish Framework of Digital Competence for Teachers (M4)

In 2012, the Spanish Ministry of Education, Culture, and Sport initiated a project to create the Common Framework of Digital Competence for Teachers, which has since been updated four times (Instituto Nacional de Tecnologas Educativas y Formación del Profesor. INTEF., 2017a, 2017b). It is based on the DigComp Digital Competence Framework for Citizens (Carretero, Vuorikari, & Punie, 2017; Vuorikari, Punie,

Carretero, & Van-Den-Brande, 2016). It is a paradigm of generic digital competency for educators.

Brittish Framework of Digital Teaching (M5)

The Education and Teaching Foundation (ETF) collaborated with the JISC Corporation to develop the British Framework of Digital Teaching (Education and Training Foundation., 2019). Its primary goal is to strengthen instructors' understanding of how to use digital technology to enhance their teaching practices and professional development (Pérez-Escoda et al., 2019).

Competencies for the Professional Development of Colombian Teachers (M6)

The Colombian Ministry of Education's suggested model aims to manage teacher professional development in order to improve educational innovation using ICT (Fernanda, Saavedra, Pilar, Barrios, & Zea, 2013). It is aimed at both program designers and teachers who want to create ICT-enhanced environments that are relevant, practical, established, collaborative, and inspiring (Hernández-Suárez, 2016).

Competence-based education has attracted significant attention from the academic community. It is not uniformly competence-based throughout Europe's various educational systems. According to the European Commission, digital competence is one of the eight core competence criteria for Lifelong Learning (LLL). DigComp, the European framework for digital competence, offers people a thorough and flexible set of guidelines that may be modified to meet the demands of different demographics. However, there is a lack of studies that address the need of creating a unified structure for elementary and secondary education. It is a must to provide a digital competency framework for elementary and secondary school students throughout Europe to help fill this void. This study examines DigComp together with a group of European frameworks.

To facilitate the development and assessment of digital competence, we combine a categorical analysis with the input of educators and subject matter experts to construct performance criteria and components that contribute across five broad domains. This framework integrates the latest theoretical breakthroughs in ICT research and may be applied in any EU nation (Guitert, Romeu, and Baztán, 2020).

According to European Commission (2017), DigCompEdu is a methodology that categorizes the digital competence of educators across six domains and 22 skills. Each of the six DigCompEdu domains is dedicated to a certain facet of a teacher's work:

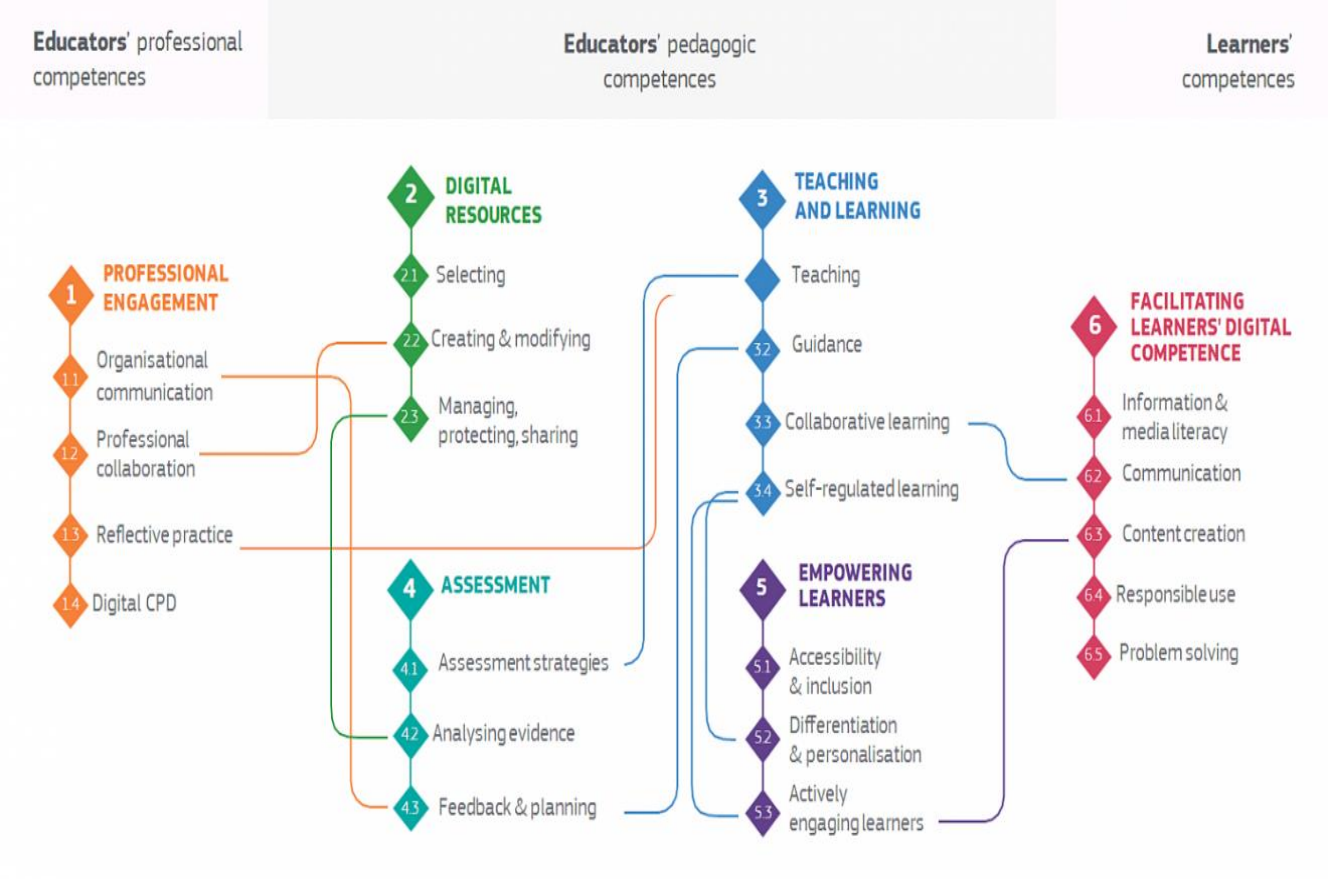


FIGURE 2: Six areas of DigCompEdu (Redecker, 2017)

The First Key Domain: Work-Related Digital Communication, Collaboration, and Professional Development

The Second Key Domain: Online Materials, Finding, creating, and exchanging digital materials.

The Third Key Domain: Educating New Students, and coordinating the implementation of digital tools for pedagogical purposes.

The Fourth Key Domain: Improving the evaluation process via the use of digital tools and techniques.

The Fifth Key Domain: Providing students with opportunities for growth, making better use of digital tools to encourage participation from all students, and tailoring instruction to their specific needs.

The Sixth Key Domain: Helping students become digitally competent, empowering students to utilize digital tools for research, collaboration, content production, self-care, and problem solving in innovative and ethical ways.

One of the greatest advantages of digital technology in the classroom is its ability to bolster learner-centered didactic practices and increase students' active participation in and ownership of the learning process. Thus, digital technology may be utilized to encourage students' active participation in the learning process, whether it be in the form of subject exploration, solution experimentation, relationship comprehension, creative problem solving, or artifact construction and reflection. In addition, digital technology may help facilitate differentiation and personalized education in the classroom by providing students with learning opportunities tailored to their specific skill sets, areas of interest, and pedagogical requirements. Care must be taken, however, to maintain accessibility for all students, including those with special educational needs, and to avoid exacerbating preexisting inequalities (such as in access to digital technology or digital

skills). One of the transversal competencies that educators are tasked with instilling in their students is digital competence. Educators' digital competence only includes encouraging other transversal competencies to the extent that digital tools are employed to do so; nonetheless, the capacity to support learners' digital competence is the most important aspect of digital competence (European Commission, 2017).

The ever-increasing anticipation of new technologies and the myriad of ways in which they can be applied have resulted in significant repercussions across all aspects of society. These repercussions have been felt most acutely in the realm of higher grades, where the demands to cover the implications of these technologies are beyond significant (Kvavik, 2005).

A theoretical panorama encompassing the many meanings and ideas in connection to digital skills is presented for the reader to get familiar with. This method offers knowledge on a variety of topics that are relevant to digital technology. Following is information that can help you provide new perspectives, such as the issue's significance and ramifications, as well as the digital skills educators must possess to meet the current demand in education. (Blevins, 2018).

In conclusion, a wide range of anticipations are discussed in regard to the potential facets that may be produced on the basis of such an important issue. The impact of using new technologies has resulted in the creation of new mechanisms of interaction in society. These new mechanisms are, by default, redefining the role and usefulness of academic institutions, which were previously characterized by their relative immobility. There is no doubt that it will continue to produce more changes that freeze traditional ideas. Finally, educators explicitly initialed the concept by claiming that technology competences are indispensable tools to qualify education in schools and universities,

underscoring the importance of digital competencies in society and the responsibility of universities in particular. There must be a shift in the university's approach to learning, administration, the humanities, and the sciences if it is to adapt to the changing character of the digital world. How the society that undervalues all things linked to technological progress will be affected by the advent of digital schooling (Levano-Francia, Sanchez Diaz, Guillén-Aparicio, Tello-Cabello, Herrera-Paico, and Collantes-Inga, 2019).

According to Caena, and Redecker (2019), educators will need to adapt their methods of instruction and acquire new skills. An exemplar of this effort that takes account of these requirements is the European Framework for the Digital Competence of Educators (DigCompEdu). With institutional and cultural needs in various countries, the European Framework for the Digital Competence of Educators was also designed to be flexible enough to accommodate future changes. It connects the growing digital skills of educators with those of their pupils and, by extension, with the strengthening of educational institutions. The framework is flexible enough to be adapted to changing technology requirements while still being applicable in a variety of educational contexts. Therefore, a multilingual, publicly available online self-assessment instrument has been created to help teachers get familiar with the DigCompEdu framework and incorporate its notions into their own practical conceptions regarding digital teaching competency. Together with the creation and rollout of the tool, a stakeholder community was established, where experts and practitioners could discuss and refine the tool of conceptual design, as well as share their own experiences in adapting the framework and using the tool in various settings. The European Framework for the Digital Competence of Educators (DigCompEdu) was published by the European Commission's Joint Research Centre with a focus on the digital competences that are specific to the teaching profession in order to better understand the digital competences teachers need to develop in order to

meaningfully integrate digital technologies in education and support the acquisition of students' digital competences (Redecker, 2017). It is based on extensive conversations with experts and stakeholders and strives to organize the available ideas and evidence into a single, all-encompassing model that can be used in any educational setting. As an example of how frameworks may promote innovation in education and teacher professional development, this framework's creation and distribution serve as an excellent study.

2.2 Review of Empirical Studies

This section includes the related studies to the European digital competence framework, ordered from oldest to newest as follows:

Abuhmaid (2011), conducted a study that aimed to how ICT continues to affect every area of our lives, and it is also having an ever-increasing function and presence in the classroom. There are several ongoing reform initiatives that hope to increase the use of technology in classrooms. It is often held that teachers are the driving force behind any educational reform. In light of this, the Jordanian Ministry of Education has approved a number of ICT training courses designed to provide educators with the skills they need to successfully incorporate ICT into curricular practices at all levels. This research examines how well and how efficiently Jordan's schools are implementing new information and communication technology (ICT) training courses. Data were gathered via in-depth interviews, surveys, classroom observations, and field notes documenting instructional strategies. The results imply that teachers' participation in ICT professional development courses led to an increase in the educators' mastery of the subject. The timing and styles of training, follow-up, teachers' beliefs, school culture, teachers'

workloads, and teachers' motivation all seemed to affect the efficacy of training courses, according to other findings.

In Bennett's (2014) research, he investigated how the Digital Literacies Framework developed by Sharpe and Beetham for modeling students' digital literacy skills might be extended to the digital literacy practices of educators. The purpose of this research is to determine whether or not this pyramid model accurately portrays the reasons why lecturers in higher education adopted technology-enhanced learning as part of their pedagogical methods. Although Sharpe and Beetham's model is useful in many ways, the paper argues that these professors were more interested in achieving their pedagogical goals than in becoming digital practitioners.

Al Bataineh and Anderson's study (2015) examined the perceptions of Jordanian social studies teachers ranging from seventh to twelfth grade regarding the level of competency required for the implementation of technology in their classrooms using a cross-sectional survey design and a scale of ten points similar to the Likert scale. The questionnaire that was used for this research was a slightly altered version of a survey called the Technology in Education Survey that was designed by Kelly (2003) as cited in Al Bataineh and Anderson (2015). (TIES). On this scale, one represented the lowest score, indicating that the subject was neither significant nor competent, and ten represented the greatest score, indicating that the subject was either very important or extremely competent. The researcher decided to utilize an Arabic-language version of the survey that was administered by Al Ghazo (2008) as cited in Al Bataineh and Anderson (2015) due to the cultural setting of the investigation. The convenience sample included a balanced representation of male and female educators, with 135 of the former and 86 of the latter. It was discovered that there is a substantial relationship between the age of

social studies instructors and their gender in terms of their judgments of the level of expertise required to adopt technology. Female teachers who were thirty or younger and who were thirty-one to thirty-nine scored the highest mean of perceptions of competency toward implementing technology in social studies classrooms, scoring higher than all male teachers. On the other hand, male and female teachers who were forty or older scored the same lowest mean (49.5) of perceptions of competency. Those scores were higher than all male teachers. When it came to the implementation of technology in social studies classrooms, female teachers with the least amount of teaching experience had higher perceptions of their own competency than male teachers, while female teachers with the most teaching experience had lower perceptions of their own competency than male teachers. Teachers of social studies, leaders of professional development, decision-makers at the national level, and other educators in the field of social studies who are interested in better understanding the factors that influence the use of technology in social studies classrooms in Jordan can benefit from the findings of the study by gaining access to the information that it provides.

Blayone, T., Mykhailenko, O., VanOostveen, R., Grebeshkov, O., Hrebeshkova, O., & Vostryakov, O. (2017) investigated the level of preparedness for completely online collaborative learning among faculty and students. There were 244 people who took the General Technology Competence and Use profile assessment, which measures digital expertise and confidence across four areas of human-computer engagement. Reports of skill were compared to the three factors of effective collaborative learning outlined by the Community of Inquiry model to determine how well prepared participants were. Self-reported technical, social, and informational competencies are moderate to poor, with epistemological competencies continuously low. This is true across the board, despite some important variations between students and instructors. These results show that

neither students nor instructors are ready for a completely online learning environment that requires them to demonstrate high levels of social, cognitive, and instructional presence. It is suggested that learning new digital skills should be a top emphasis in schools.

Cabero and Palacios's (2020) study aimed to provide an objective and rigorous analysis of the concept, studying the main European framework of teaching digital competence "DigCompEdu". In they used "DigCompEdu Check-In" questionnaire to evaluate digital competence. The result showed that it is essential to structure and evaluate personalized training plans and to improve the level of digital competence of teachers. Likewise, it is proposed to open different lines of research related to ICT training needs, backed by reliable and valid tools for competency assessment.

Çebi and Reisoğlu, (2020) investigated the perspectives of pre-service teachers on their degree of digital competence and to discover if these perspectives differ based on gender, branch of education, and self-perceived level of digital competence. In this particular investigation, a model known as a cross-sectional survey was used. In light of these considerations, the research was carried out with the participation of 518 future educators who were pursuing their education in various regions throughout Turkey. For the purpose of this research, a digital competency questionnaire served as the instrument for collecting data. Following an analysis of the data, it was determined that the degree of digital competence had by pre-service teachers is only modest, and that it varies considerably depending on gender, branch, and the perceived level of digital competence possessed by the individual. It is believed that the findings of this study will serve as a guide for the researchers since they will disclose the requirements of the pre-service

teachers and include information on what should be the primary emphasis of the training or activities that will be developed to address these demands.

Alarcón, Pilar-Jiménez, and Vicente-Yagüe (2020) examined the expansion upon the work done previously by developing and validating an evaluation tool that takes into account a total of eight domains. These eight domains include the six aspects that are covered by DigCompEdu as well as two new domains that correspond to extrinsic factors in the digital competence of educators. The latter term is used to refer to the particular digital resources and support services that are made accessible to educators inside their working environment. The DIGIGLO questionnaire consisted of 29 questions, all of which were answered by a total of 509 teacher educators from Spain and Latin America. An investigation into the construct validity of the Spanish language instrument as well as its psychometric properties revealed that it is a valid and reliable instrument for evaluating the level of digital competence possessed by educators in each of the eight domains that were taken into consideration.

Esteve-Mon, Llopis, and Adell-Segura (2020) found out that few works explore the connection between computational thinking and digital competence. The researchers looked at the computing knowledge and skills of 248 Spanish college students, dissecting the connections between them and the existing gaps. Most students have a moderate to high opinion of their own digital competence, placing more emphasis on the multimedia and communicative elements than on the technical ones, as shown by the findings. On the other hand, it has been shown that digital competence, particularly in the fields of communication and technology, is related to computational thinking. Similarly, the results show that women are not only seen to be less technologically adept than males,

but also achieve worse outcomes in computational thinking. These findings pave the way for new approaches to preparing future educators that aim to narrow the gender gap.

Cabero, Barroso, and Palacios (2021) examines digital competences of educators in Health Sciences. The objective of this article is to know if there are significant differences with respect to the level of CDD shown by the teachers of Health Sciences of the Andalusian universities (Spain) according to the variables gender, age, teaching experience, the time spent on using ICTs, dedication to using technology in the classroom, and technological mastery. For this purpose, an inferential study was conducted using contrast. Three hundred teachers answer the DigCompEdu Check, using a questionnaire that evaluates their competency level. The results of the study indicate that there are significant differences between groups for each variable. Therefore, the need to structure training plans is highlighted.

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, LA. et al. (2022) conducted a study that aims to give a comprehensive evaluation of the literature in the Web of Science and Scopus in order to locate, examine, and categorize the publications published on digital competencies between the years 2000 and 2021. For this investigation, Basilotta-Gómez-Pablos et al. (2022) used the SciMAT program. More than 343 articles are found in English after the first search; 152 are duplicates, and 135 are unrelated to the study's focus. The final number of papers that was gathered and thoroughly examined is 56. The findings point to a plethora of studies that examine educators' own evaluations and reflections on their digital literacy skills. Teachers are aware that they lack specific abilities, particularly those connected to the assessment of educational practice, and that they have low or medium levels of digital competence. Despite the abundance of research in this area, more work needs to be done to better

understand the problem, develop more precise methods for assessing teachers' digital competence, and use that information to create training programs that are more relevant to teachers' needs in the modern digital age.

Wu, Zhou, Li, and Chen (2022) studied the factors that are relevant to teachers' competence to elaborate on students' information literacy. This research has to be done on the variables that influence TCDSIL as well as the tactics that are used to promote it. However, previous research on TCDSIL mostly study the elements that influence it from a single-level viewpoint and ignore the possibility of a link between TCDSIL and the school environment. In order to fill this gap and provide a deeper understanding of the complex system of TCDSIL, the researchers of this study surveyed 9909 teachers at 1286 primary and secondary schools and used a two-level hierarchical linear model to analyze the survey data. According to the findings of the investigation, there is a substantial association between TCDSIL and both the qualities of teachers and the framework in which schools operate. TCDSIL has been shown to have positively significant connections with three school-related factors: the kind of school, the resources available for education, and the network bandwidth. In addition, TCDSIL might be predicted by the perceived usefulness of instructors, their information processing abilities (the skills of information access, information consumption, and information management), and information ethics. This study provides implications regarding how to improve TCDSIL, including paying attention to the gap between primary school teachers and secondary school teachers; enriching schools' digital teaching resources; ensuring school networks are of sufficient quality; and improving teachers' perceptions of the usefulness of ICT, information processing skills, and information ethics.

Zhou and Song (2022) investigated the digital resource consumption of teacher educators and the related requirement for digital competency in higher education. A total of 405 teacher educators from two departments across the two institutions were issued an online survey; 105 filled it out. There were both short answer and free-form questions in the survey's total of 16. The TPACK model and computer self-efficacy were employed as theoretical underpinnings. The findings of an examination of teacher educators' self-reported usage, competency, and need for professional training in digitalization in teaching demonstrate that these individuals do not predominantly employ digital technologies for pedagogical goals. They need substantial pedagogical assistance in developing digital pedagogy. Moreover, in order to raise motivation for tangible, practical, and subject-oriented successful examples offered by experienced instructors, teacher educators need to find the pedagogical surplus value in their own teaching and learning environment using digital technologies.

The Joint Research Center (JRC) has developed a questionnaire-based instrument for self-reflection on the degree of digital competence based on the DigCompEdu5 framework (DigCompEdu, 2017). The DigCompEdu Check-In Self-reflection Tool is a tool designed to help educators improve their competence. This tool was developed with the intention of being used across all levels of education, but with specific suggestions for terminology adaption at each step. It was first validated for use in elementary and secondary education (Caena and Redecker, 2019), but validations for use in higher education and other educational levels are still in the works. It was first released online as part of a pilot initiative called Check-In. The instrument was written in English and contained a total of 22 questions that were all connected to one of the six facets of the model, which were as follows: professional engagement; digital resources; teaching and learning; assessment and feedback; empowering learners; and facilitating learners' digital

competence. In each of the questions, there were six different ways to respond, ranging from the least to the most apparent degree of confidence. The tool was created to not only assess the level of digital competence based on the reflections of educators (set at six proficiency levels, from A1 to C2, following a similar pattern to the CEFR), but also to provide specific guidance, based on the responses, for improving each of the 22 competences that are included in the DigCompEdu Framework. The results showed that because there were no significant differences discovered in gender dimension, it is thus considered gender to be a trait that has no influence on the ways in which educators perceive students' digital competence. There were noticeable gaps in one's own sense of identity amongst people of different ages. To be more specific: the oldest age group (60+) had a worse self-perception than any other group; the second-oldest age group (50-59) had a worse self-perception than any younger group but a better self-perception than the 60+ group; there were no significant differences between the other groups (comprising ages 25-49), so their self-perceptions can be regarded as being indistinguishable from one another. Therefore, there are discernible disparities between the age groups that were discussed before. Given the association that exists between a teacher's age and the number of years they have spent in the classroom, these findings are in line with those that were obtained by considering teaching experience as a variable. However, there were statistically significant differences between the three different academic areas. Across the board, academics working in the social sciences as well as arts and humanities reported the greatest levels of self-perception. On the other hand, academics in the sciences and health sciences had the lowest levels of self-perception, in contrast, academics in engineering and architecture had a lower self-perception.

2.3 Commentary on previous studies

Some previous studies agreed with the researcher on the importance of studying teachers' digital competences Blayone, T., Mykhailenko, O., VanOostveen, R., Grebeshkov, O., Hrebeshkova, O., & Vostryakov, O. (2017) investigatedthat is used to study the users' behavior toward technology (Fordham &Vannatta, 2005; Young JuJoo, Sunyoung Park& Eugene, 2017).

There are many researchers investigated the effect of digital competency on teachers' attitudes Cabero and Palacios's (2020) A study of the European framework of teaching digital competence "DigCompEdu" has shown that it is essential to structure and evaluate personalized training plans and to improve the level of digital competence of teachers. The result showed that it was important to open different lines of research related to ICT training needs, backed by reliable tools for competency assessment.

Çebi and Reisoğlu, (2020) investigated the perspectives of pre-service teachers on their degree of digital competence and to discover if these perspectives differ based on gender, branch of education, and self-perceived level of digital competence.

Alarcón, Pilar-Jiménez, and Vicente-Yagüe (2020) examined the expansion upon the work done previously by developing and validating an evaluation tool that takes into account a total of eight domains. The DIGIGLO questionnaire consisted of 29 questions, all of which were answered by a total of 509 teacher educators from Spain and Latin America. An investigation into the construct validity of the Spanish language instrument as well as its psychometric properties revealed that it is a valid and reliable instrument for evaluating digital competence.

Spanish researchers have found out that few works explore the connection between computational thinking and digital competence. Most students have a moderate to high

opinion of their own digital competence, placing more emphasis on the multimedia and communicative elements than the technical ones. Digital competence, particularly in the fields of communication and technology, is related to computational thinking. The results show that women are not only seen to be less technologically adept than males, but also achieve worse outcomes in computing thinking.

DigCompEdu (2021) examines digital competences of educators in Health Sciences. The objective of this article is to know if there are significant differences with respect to the level of CDD shown by the teachers of Health Sciences of the Andalusian universities (Spain) According to the variables gender, age, teaching experience, the time spent on ICTs, dedication to using technology in the classroom, and technological mastery.

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, LA. et al. (2022), A study aims to give a comprehensive evaluation of the literature in the Web of Science and Scopus. More than 343 articles are found in English after the first search; 152 are duplicates, and 135 are unrelated to the study's focus. The findings point to a plethora of studies that examine educators' own evaluations and reflections on their digital literacy skills. More work needs to be done to develop more precise methods for assessing teachers' digital competence.

Wu, Zhou, Li, and Chen (2022) investigated the factors relevant to teachers' information literacy instruction ability. TCDSIL has been demonstrated to have substantial positive relationships with three school-related factors: school type, educational resources, and network bandwidth. According to the investigation's findings, there is a significant correlation between TCDSIL and both the characteristics of teachers and the operational structure of schools. This study offers recommendations for improving TCDSIL, such as addressing the gap between primary and secondary school

teachers, enhancing digital teaching resources in schools, ensuring school networks are of sufficient quality, and enhancing teachers' perceptions of the usefulness of ICT, information processing skills, and information ethics.

Caena and Redecker (2019) report that DigCompEdu investigates the European Framework for the Digital Competence of Educators. The framework links the expanding digital skills of educators to those of their students. It is adaptable to evolving technological needs and useful in a range of educational settings. Teachers can familiarize themselves with the digcompEdu framework with the use of a multilingual, publicly accessible online self-evaluation tool.

Al Bataineh and Anderson's study (2015) examined the perceptions of Jordanian social studies teachers regarding the level of competency required for the implementation of technology in their classrooms. Female teachers with the least amount of teaching experience had higher perceptions of their own competency than male teachers. Male and female teachers who were forty or older scored the same lowest mean (49.5) of perceptions of competency.

CHAPTER THREE
Method and Procedure

This chapter describes the methods used in this study. It provides information on the sample and participant selection. It also discusses the instruments' validity and reliability. The section finishes with a discussion of the study's methodology and data analysis framework.

3.1 Method of the Study

A descriptive research methodology was used in this study; thus, a quantitative data collection procedures was employed to answer the research questions.

The data was collected from a teachers' questionnaire that highlights the six areas of digital competence among educators.

3.2 Population and Sample of the Study

The population of the current study consisted of all teachers from different demographic backgrounds who works at private schools in Amman. The sample is a purposive one as the participants were chosen on grounds of convenience and on the basis of availability.

190 Educators was the population of the sample, 19 results were dropped for the reliability of the instrument, 171 was the actual number of the sample from all subjects including the ones not included in the purpose of the study who taught other subjects than Sciences and English and humanities which calculated the number of 20 educators.

The total of respondents to the questionnaire was 123, 28 participants did not respond at all. The age of the participants ranged from 21-above 40 years. The participants shared experience in teaching their subjects at the International Independent School in different classrooms that teach English and Humanities and Sciences.

Selection of the Subjects

The teachers' sample was drawn on purpose and consisted of 123 teachers. All teachers teach at the International Independent School. They were asked to respond to a questionnaire. The teachers' sample was analyzed according to gender, age, educational level, major, and teaching experience as shown in Table (1).

Table (1)
Teachers' Sample

variables	category	counts	%
Gender	Male	27	22.0
	Female	96	78.0
	Total	123	100.0
Age	21 - 29	37	30.1
	30 - 39	45	36.6
	above 40	41	33.3
	Total	123	100.0
Educational level	Undergraduate Degree	22	17.9
	Graduate	101	82.1
	Total	123	100.0
Major	English And Humanities	63	51.2
	Sciences	60	48.8
	Total	123	100.0
Teaching experience	1-5	43	35.0
	6-10	30	24.4
	Above 10	50	40.7
	Total	123	100.0

3.3 Study Instrument

One instrument was used in this study which was a teachers' questionnaire. The questionnaire was followed by its validity and reliability procedures. Rating Scale questions calculate a weighted average based on the weight assigned to each answer choice. The questionnaire was generated in light of the key domains of the DigCompEdu

evolved by the European Commission (2017). DigCompEdu has been developed by the European Commission (2017) to classify teachers' digital competence across six domains and 22 abilities.

The six DigCompEdu subdomains focus on different aspects of a teacher's achievement. The primary focus of the first key domain is on the use of technology for enhancing interpersonal and professional relationships in the workplace. Finding, making, and using digital materials online is the focus of the second key domain. Evaluating how well new student education is handled and coordinating the use of technology in the classroom fall under the third key domain. Using digital tools and approaches to enhance the evaluation process is the focus of the fourth key area. The fifth key area evaluates whether or not students have access to growth opportunities, whether or not digital resources are being used to their full potential to increase student engagement, and whether or not instruction is being adapted to meet the requirements of individual students. Helping students develop digital competence in research, collaboration, content production, self-care, and problem solving is the focus of the sixth and the final keydomain.

Based on Likert responds' scale which ranged between (strongly disagree with a weight of 1 to strongly agree with a weight of 5). The competencies were classified into three levels (low from 1-2.33, moderate from 2.34-3.67 and high from 3.68-5).

The questionnaire consisted of six sections; the first one was structured to elicit personal related data, check the frequency of using digital competence tools, and investigate the functions of digital competence tools used in the classrooms. It comprises 23 questions (See Appendix A).

3.4 Validity and Reliability of the Questionnaire

3.4.1 Validity of the Questionnaire

The questionnaire was dispersed to a panel of experts, whose participation was requested for establishing content validity of the questionnaire. The panel was asked to review and check its convenience. Some changes were made in the wording of some statements and a few statements were eliminated. The final copy of the questionnaire was updated by 80%, and distributed to the participants of the study.

3.4.2 Reliability of the Questionnaire

The questionnaire was piloted to check its reliability. Nineteen teachers who were not part of the main sample were selected to respond to the questionnaire. After one week, it was administrated again for the second time and the results showed stability in the answers.

Table (2)
The competencies reliability using the Cronbach alpha (CA)

Competency	No. of items	Cronbach alpha
Professional Engagement	4	0.734
Digital Resources	5	0.887
Teaching and Learning	4	0.876
Assessment Using digital technology	3	0.835
Empowering Learners	3	0.845
Facilitating Learners' Digital Competence	4	0.780
Overall Digital Competencies	23	0.915

Table (2) reflects of Cronbach alpha (CA) reliability. The Cronbach alpha values range between (0 - 1) such that maximum value that can be reached is (1.1) which reflects a high reliability. Most researches, consider the minimum value of (0.70) or greater to report the high reliability.

Back to the mentioned Cronbach alpha (CA) values, it can be noticed that the Cronbach alpha (CA) for the Professional Engagement competency was (0.734), for the digital resources competency it was (0.887), for the Teaching and Learning competency it reaches (0.876,) for the Assessment Using digital technology competency it was (0.835), in the same context the CA value for the Empowering Learners competency was (0.780) and the Cronbach alpha value for the Overall Digital Competencies was (0.915).

It is clear that all the mentioned Cronbach alpha (CA) values were greater than the minimum required threshold (0.70), there by the reliability was considered to be achieved.

3.5 Data Analysis

3.5.1 Data analysis (Processing data)

The data of the research was analyzed, SPSS program was used for the following statistical procedures.

In order to classify the competencies; means were used to express quantum (magnitude) of each competency based on Likert responds' scale which raged between (strongly dis agree with a weight of 1.00 to strongly agree with a weight of 5.00). The competencies were classified into three levels (low, moderate and high). The boundaries of each degree were:

1.00 – 2.33	low
2.34 – 3.67	moderate
3.68 – 5.00	high

These levels were derived according to the following formula

$$\text{Level width} = \frac{\text{(Highest respond weight – Lowest respond rate)}}{\text{(3) Levels}}$$

$$= \frac{(5-1)}{3} = 1.33$$

3.5.2 Data analysis (Statistical treatments)

Statistical analyses were performed on the data collected from the surveys. Data analysis included the use of frequencies, percentages, means, and standard deviation. To answer the first question of the Study, as for the second question of the study One Way Anova was used to answer the question, Cronbach alpha was used to check reliability of the study instrument.

3.5.3 Data analysis (Statistical techniques)

1. Frequencies and percentage: to describe the number and proportion of respondent's categories over the demographic and personal information
2. Cronbach alpha: a measure used to evaluate the ratio of the sum of item variances to the variance of the total sum and adjusted to the number of items (internal consistency)
3. The mean: one of the most important indictors used to describe a value where most of the values tend to center
4. Standard deviation: one of the most measure of dispersions. It describes the average of the values of data set is a way from the mean
5. significance it reflects the magnitude of type 1 error
6. independent samples T test: represents the magnitude of standardized means difference between two means representing two categories
7. One-way analysis of variance (one Way ANOVA) to assess the significance of means differences related to a categorical variable.

3.6 Research Procedures

The following steps were implemented as study procedures to achieve the objective of the study:

1) The research procedures began with a review of theoretical and empirical studies related to the topic of investigation for the purpose of establishing the instruments of the current study and to set the research procedures.
2) The researcher constructed the teachers' questionnaire, and checked its validity and reliability by a panel of experts.
3) The researcher obtained a letter of permission from Middle East University to facilitate the process of researching (See Appendix B).
4) The researcher selected the sample to apply on it the instrument of the study. The instrument was applied.
5) Questions were answered by the teacher.
6) After the data were collected in November 2022, the researcher categorized and analyzed them by tabulating the data and calculated their means and percentages.
7) Results were discussed and recommendations were suggested.

CHAPTER FOUR

Results of the Study

4.0 Introduction

This chapter reports the findings of the study questions raised by the study. The findings of the questionnaire are described, narrated and illustrated in tables.

4.1 Results of Question One

1. What is the digital competence the educators have ?

The researcher conducted an analysis of the European Digital Competence Framework Approach in relation to the digital competence of the teachers at the International Independent School.

Table (3)
Levels of the digital competence in the arranged according to the means in a descending order

No.	Digital Competencies	mean	standard deviations	level	Rank
1	Professional Engagement	4.31	0.49	High	1
2	Digital Resources	4.08	0.46	High	2
3	Teaching and Learning	3.95	0.54	High	3
4	Assessment Using digital technology	3.95	0.65	High	3
5	Empowering Learners	3.91	0.54	High	5
6	Facilitating Learners' Digital Competence	3.90	0.60	High	6
	Overall Digital Competencies	4.02	0.43	High	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (3) indicates the values of means, standard deviations for the Levels of the digital competence arranged in a descending means order. The results declared that" Professional Engagement" had recorded the highest mean being rated (by the sample) as it ranked the first by a mean of (4.31), while the Facilitating Learners' Digital Competence had recorded the least mean (3.90).

The overall assessment degree of digital competence was rated by a mean of (4.02). This value expressed a high level of digital competency possession among the teachers according to their self-evaluations.

Table (4)
Levels of the sub digital competence representing the (Professional Engagement) competency - arranged in a descending means order

No.	Sub competencies	mean	standard deviations	level	Rank
1	I routinely make use of digital tools including email, the institution portal, and apps to improve my interactions with students and colleagues.	4.66	0.54	High	1
2	I utilize many types of technology to collaborate with educators inside my institution.	4.41	0.61	High	2
3	I'm committed to improve my digital pedagogy.	4.29	0.62	High	3
4	I make use of distance learning capabilities like MOOCs, webinars, and virtual conferences.	3.87	0.86	High	4
	Over all Professional Engagement competency	4.0	0.49	High	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (4) indicates the levels of the sub digital competence representing the (Professional Engagement) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 1 which states "I routinely make use of digital tools including email, the institution portal, and apps to improve my interactions with students and colleagues." had reported the greatest rate by the sample as it ranked the first by a mean of (4.66) and showed a high level, while item no. 5 which states " I make use of distance learning capabilities like MOOCs, webinars, and virtual conferences. " was the least item being rated by the sample as it satisfied the least mean value (3.87) and reflected a high level.

The Overall Professional Engagement competency degree was rated by a mean of (4.31). This value expresses a high-level competency from the point of view sample teachers.

Table (5)
Levels of the sub digital competence representing the (Digital Resources) competency - arranged in a descending means order

No.	Sub Competencies	mean	standard deviations	level	Rank
4	I choose educational digital services that are useful for learners and educators.	4.18	0.68	High	1
2	The digital tools are always up-to-date to suit my specific requirements.	4.12	0.58	High	2
3	To understand the use and creation of open licenses and open educational resources, including their proper attribution.	4.06	0.68	High	3
1	I go through results from various online databases and use a number of search methods to choose a wide variety of useful digital materials.	4.03	0.78	High	4
5	I regularly engage in virtual forums and social networks for professional development.	4.01	0.72	High	5
	Over all Digital Resources competency	4.08	0.46	high	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (5) indicates the levels of the sub digital competence representing the (Digital Resources) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 4 which states " I choose educational digital services that are useful for learners and educators." Had reported the highest rate by the sample as it ranked the first by a mean of (4.18) and showed a high level, while item no. 5 which states " I regularly engage in virtual forums and social networks for professional development. " had reflected the least item being rated by the sample as it satisfied the least mean value (4.01) and showed a high level.

The Overall Digital Resources competency degree was rated by a mean of (4.08). This value expresses a high-level competency from the point of view sample teachers.

Table (6)
Levels of the sub digital competence representing the (Teaching and Learning) competency - arranged in a descending means order

No.	Sub competencies	mean	standard deviations	level	Rank
1	I carefully evaluate how, when, and why to utilize digital tools in education to ensure that they offer value.	4.17	0.60	High	1
2	I keep track of my students' activities and interactions in the collaborative online settings in which we work.	4.12	0.72	High	2
3	My classes often work in teams, and when they do, they utilize various forms of digital technology to collect and record information.	3.80	0.81	High	3
4	I implement digital tools that give students control over their own learning process, including self-assessment tests, e-Portfolios, online journals, and online discussions.	3.72	0.87	High	4
	Over all Teaching and Learning competency	3.95	0.54	high	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (6) indicates the levels of the sub digital competence representing the (Teaching and Learning) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 1 which states " I carefully evaluate how, when, and why to utilize digital tools in education to ensure that they offer value." Had reported the highest rate by the sample as it ranked the first by a mean of (4.17) and showed a high level. while item no. 4 which states " I implement digital tools that give students control over their own learning process, including self-assessment tests, e-Portfolios, online journals, and online discussions." had reflected the least item being rated by the sample as it satisfied the least mean value (3.72) and showed a high level.

The Overall Teaching and Learning competency degree was rated by a mean of (3.95). This value expresses a high-level competency from the point of view sample teachers.

Table (7)
Levels of the sub digital competence representing the (Teaching and Learning) competency - arranged in a descending means order

No.	Sub competencies	mean	standard deviations	level	Rank
3	I use online tools to give useful feedback.	3.99	0.74	High	3
2	I evaluate all of the information I have about my students, such as their participation, performance, grades, and attendance, as well as their activities and social connections in (online) settings, to determine personal and academic abilities.	3.97	0.73	High	2
1	I check up on my students' development using online assessment tools.	3.89	0.78	High	1
	Overall Assessment Using digital technology competency	3.95	0.65	high	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (7) indicates the levels of the sub digital competence representing the (Teaching and Learning) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 3 which states "I use online tools to give useful feedback." Had reported the highest rate by the sample as it ranked the first by a mean of (3.99) and showed a high level. while item no. 1 which states " I check up on my students' development using online assessment tools." had reflected the least item being rated by the sample as it satisfied the least mean value (3.89) and showed a high level.

The Overall Assessment Using digital technology competency degree was rated by a mean of (3.95). This value expresses a high-level competency from the point of view sample teachers.

Table (8)
Levels of the sub digital competence representing the (Empowering Learners) competency - arranged in a descending means order

No.	Sub competencies	mean	standard deviations	level	Rank
3	To get my students involved in class discussions and activities, I rely on digital tools.	4.00	0.72	High	3
1	I take into account and try to remedy any digital issues when designing digital assignments for students, such as lack of digital skills or insufficient access to digital devices and resources.	3.95	0.68	High	1
2	I customize my students' educational experiences by using digital tools; for instance, I provide unique digital assignments to each student so that I may cater to their specific requirements.	3.77	0.71	High	2
	Over all Empowering Learners competency	3.91	0.54	high	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (8) indicates the levels of the sub digital competence representing the (Empowering Learners) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 3 which states " To get my students involved in class discussions and activities, I rely on digital tools." Had reported the highest rate by the sample as it ranked the first by a mean of (4.00) and reflected a high level. while item no. 2 which states " I customize my students' educational experiences by using digital tools; for instance, I provide unique digital assignments to each student so that I may cater to their specific requirements." had showed the least item being rated by the sample as it achieved the least mean value (3.77) and depicted a high level.

The Overall Empowering Learners competency degree was rated by a mean of (3.91). This value represented a high-level competency from the point of view sample teachers.

Table (9)
Levels of the sub digital competence representing the (Facilitating Learners' Digital Competence) competency - arranged in a descending means order

No.	Sub competencies	mean	standard deviations	level	Rank
2	I give them tasks that require accessing to the internet, either group work or individual practice, to go beyond the classroom environment.	3.99	0.76	High	1
3	I give them homework that involves making something digital, such a video, audio recording, photograph, digital presentation, blog post, wiki page, etc.	3.98	0.76	High	2
1	I instruct my students on how to determine whether or not a source is credible and how to spot misinformation and other forms of prejudice.	3.85	0.71	High	3
4	My classes focus on helping students learn to navigate the internet in a responsible manner.	3.80	0.84	High	4
	Over all Facilitating Learners' Digital Competence competency	3.90	0.60	High	

Means description categories (1 – 2.33: low, 2.34 – 2.67: moderate, and 3. 68 – 5.00: high)

Table (9) indicates the levels of the sub digital competence representing the (Facilitating Learners' Digital Competence) competency in light of the European digital competence framework approach. Exploring the table's figures, Item no. 2 which states "I give them tasks that require accessing to the internet, either group work or individual practice, to go beyond the classroom environment." Had reported the highest rate by the sample as it ranked the first by a mean of (3.99) and reflected a high level. while item no. 4 which states " My classes focus on helping students learn to navigate the internet in a responsible manner." had showed the least item being rated by the sample as it achieved the least mean value (3.80) and alluded to a high level.

The Overall Facilitating Learners' Digital Competence competency degree was rated by a mean of (3.90). This value represented a high-level competency from the point of view sample teachers.

4.2 Results of Question Two

2) Does the degree of possession of digital competencies in teaching vary according to the following variables gender, age, qualifications, major and expertise of the teachers?

The digital competencies in the International Independent School in light of the European digital competence framework approach differ significantly at (0.05) between the categories of gender, academic qualification, and expertise variables

To answer this question independent samples "t" test and one-way ANOVA were performed. The results were uploaded in the following tables:

1. Differences in digital competencies according to gender

Table (10)
Means differences between the digital competences based on gender

Competencies	Gender	n	Mean	standard deviations	t	Sig.	result
Professional Engagement	males	27	4.37	0.53	0.72	0.468	Not sig
	female	96	4.29	0.48			
Digital Resources	males	27	4.04	0.48	0.52	0.603	Not sig
	female	96	4.09	0.46			
Teaching and Learning	males	27	4.01	0.56	0.60	0.547	Not sig
	female	96	3.94	0.54			
Assessment Using digital technology	males	27	4.07	0.65	1.11	0.266	Not sig
	female	96	3.92	0.65			
Empowering Learners	males	27	3.83	0.62	0.88	0.377	Not sig
	female	96	3.93	0.51			
Facilitating Learners' Digital Competence	males	27	3.92	0.71	1.20	0.905	Not sig
	female	96	3.90	0.57			
overall digital competencies	males	27	4.04	0.52	0.29	0.768	Not sig
	female	96	4.01	0.41			

The figures provided by Table (10) reflect the means differences concerning the digital competence in the International Independent School according to gender. For this purpose, the statistical test being consulted was the "t" test. Along with the "t" test, a significance value was provided. the significance value for the Professional Engagement

competency was (0.468), for the Digital Resources competency it was (0.603), for the Teaching and Learning competency it was (0.547), in the same context, the significance value pertaining the Assessment Using digital technology was found to be (0.266), for the Empowering Learners competency it was (0.377) and for the Facilitating Learners' Digital Competence it reaches (0.905).

Regarding the significance value, being reported for the overall digital competencies, it was (0.768). Comparing the obtained significance values to 0.05 it was clear that all the obtained significance values were greater than 0.05; indicating no significance means differences in the digital competencies according to gender.

2. Differences in digital competencies according to educational level

Table (11)
Means differences between the digital competences in the International Independent School based on Qualifications

Competencies	Gender	n	Mean	standard deviations	t	sig	result
Professional Engagement	males	27	4.37	0.53	0.72	0.468	Not sig
	female	96	4.29	0.48			
Digital Resources	males	27	4.04	0.48	0.52	0.603	Not sig
	female	96	4.09	0.46			
Teaching and Learning	males	27	4.01	0.56	0.60	0.547	Not sig
	female	96	3.94	0.54			
Assessment Using digital technology	males	27	4.07	0.65	1.11	0.266	Not sig
	female	96	3.92	0.65			
Empowering Learners	males	27	3.83	0.62	0.88	0.377	Not sig
	female	96	3.93	0.51			
Facilitating Learners' Digital Competence	males	27	3.92	0.71	1.20	0.905	Not sig
	female	96	3.90	0.57			
overall digital competencies	males	27	4.04	0.52	0.29	0.768	Not sig
	female	96	4.01	0.41			

The figures provided by table (11) reflects the means differences concerning the digital competence in the International Independent School according to educators qualifications. For this purpose, the statistical test being consulted was the "t" test. Along

with the "t" test a significance value was provided. the significance value for the Professional Engagement competency was (0.923), for the Digital Resources competency it was (0.167), for the Teaching and Learning competency it was (0.924), in the same context, the significance value pertaining the Assessment Using digital technology was found to be (0.611), for the Empowering Learners competency it was (0.875) and for the Facilitating Learners' Digital Competence it reaches (0.725).

Regarding the significance value being reported for the overall digital competencies it was (0.866). Comparing the obtained significance values to 0.05 it was clear that all the obtained significance values were greater than 0.05; indicating no significant means differences in the digital competencies according to educational level.

3. Differences in digital competencies according to major

Table (12)
Means differences between the digital competences in the International Independent School based on major

Competencies	Educational level	n	Mean	standard deviations	t	sig	Result
Professional Engagement	Undergraduate	22	4.32	0.58	0.096	0.923	Not sig
	Graduate	101	4.31	0.48			
Digital Resources	Undergraduate	22	3.95	0.55	1.39	0.167	Not sig
	Graduate	101	4.10	0.44			
Teaching and Learning	Undergraduate	22	3.94	0.64	0.096	0.924	Not sig
	Graduate	101	3.96	0.52			
Assessment Using digital technology	Undergraduate	22	4.02	0.70	0.51	0.611	Not sig
	Graduate	101	3.94	0.64			
Empowering Learners	Undergraduate	22	3.92	0.64	0.158	0.875	Not sig
	Graduate	101	3.90	0.51			
Facilitating Learners' Digital Competence	Undergraduate	22	3.86	0.54	0.352	0.725	Not sig
	Graduate	101	3.91	0.61			
overall digital competencies	Undergraduate	22	4.00	0.52	0.169	0.866	Not sig
	Graduate	101	4.02	0.41			

The figures provided by table (12) reflects the means differences concerning the digital competence in the International Independent School according to major. For this purpose, the “t” test was consulted. In conjunction with the “t” test, a significance value was provided. the significance value for the Professional Engagement competency was (0.357), for the Digital Resources competency it was (0.618), for the Teaching and Learning competency it was (0.576), in the same context, the significance value pertaining the Assessment Using digital technology was found to be (0.221), for the Empowering Learners competency it was (0.224) and for the Facilitating Learners’ Digital Competence it reaches (0.096).

Regarding the significance value being reported for the overall digital competencies it was (0.189). Comparing the obtained significance values to 0.05 it was clear that all the reported significance values were higher than 0.05; suggesting no significance means differences in the digital competencies according to major.

4. Differences in digital competencies according to age

Table (13)
Means and standard deviations for the digital competence in the International Independent School based on age

Competencies	Age category	N	mean	standard deviations
Professional Engagement	21 - 29	37	4.26	0.48
	30 - 39	45	4.37	0.48
	More than 40	41	4.29	0.53
Digital Resources	21 - 29	37	4.03	0.41
	30 - 39	45	4.17	0.45
	above 40	41	4.02	0.51
Teaching and Learning	21 - 29	37	3.93	0.59
	30 - 39	45	4.01	0.46
	above 40	41	3.91	0.60

Competencies	Age category	N	mean	standard deviations
Assessment Using digital technology	21 - 29	37	4.03	0.58
	30 - 39	45	4.03	0.56
	above 40	41	3.80	0.77
Empowering Learners	21 - 29	37	3.97	0.46
	30 - 39	45	3.93	0.45
	above 40	41	3.83	0.67
Facilitating Learners' Digital Competence	21 - 29	37	3.86	0.62
	30 - 39	45	4.04	0.54
	above 40	41	3.80	0.62
overall digital competencies	21 - 29	37	4.01	0.42
	30 - 39	45	4.09	0.34
	above 40	41	3.94	0.52

Table (13) reflects the means and standard deviation values of the sample's opinions concerning the digital competence in the International Independent School with respect to the respondent's age' category. It is clear that the means values are not equal among the different age categories. To investigate the statistical significance of the means differences one-way ANOVA was conducted. The results are given in table (14) below

Table (14)
Results of one way-ANOVA for the for the digital competence in the International Independent School based on age

Competencies	Variation source	sum of squares	df	mean squares	f	Sig	Result
Professional Engagement	Age	.301	2	.151	.611	.544	Not sig
	error	29.584	120	.247			
	Total	29.885	122				
Digital Resources	Age	.586	2	.293	1.384	.254	Not sig
	error	25.385	120	.212			
	Total	25.971	122				
Teaching and Learning	Age	.249	2	.124	.417	.660	Not sig
	error	35.795	120	.298			
	Total	36.044	122				

Competencies	Variation source	sum of squares	df	mean squares	f	Sig	Result
Assessment Using digital technology	Age	1.468	2	.734	1.776	.174	Not sig
	error	49.573	120	.413			
	Total	51.041	122				
Empowering Learners	Age	.425	2	.212	.738	.480	Not sig
	error	34.531	120	.288			
	Total	34.956	122				
Facilitating Learners' Digital Competence	Age	1.351	2	.675	1.920	.151	Not sig
	error	42.214	120	.352			
	Total	43.565	122				
overall digital competencies	Age	.487	2	.243	1.311	.273	Not sig
	error	22.259	120	.185			
	Total	22.746	122				

Table (14) shows the results of one way-ANOVA to investigate the significance of means differences in the digital competence in the International Independent School based on age. In conjunction with the "ANOVA" test, a significance value was provided. Referring to the significance values for the Professional Engagement competency it was (0.544), for the Digital Resources competency it was (0.254), for the Teaching and Learning competency, it was (0.660), in the same context, the significance value pertaining the Assessment Using digital technology was found to be (0.174), for the Empowering Learners competency it was (0.480) and for the Facilitating Learners' Digital Competence it reaches (0.151).

The significance value revealed by the overall digital competencies was (0.275). When comparing the obtained significance values to 0.05. It was clear that all the provided significance values were greater than 0.05; suggesting no significant means differences in the digital competencies according to age categories. Accordingly, no significance means differences could be reported in the competencies with respect to age.

5. Differences in digital competencies according to teaching experience

Table (15)
Means and standard deviations for the digital competence in the International Independent School based on teaching experience

Competencies	Teaching experience category	n	mean	standard deviations
Professional Engagement	1-5	43	4.23	0.50
	6-10	30	4.32	0.54
	Above 10	50	4.37	0.46
Digital Resources	1-5	43	4.01	0.46
	6-10	30	4.11	0.51
	Above 10	50	4.11	0.43
Teaching and Learning	1-5	43	3.90	0.56
	6-10	30	3.95	0.57
	Above 10	50	4.01	0.52
Assessment Using digital technology	1-5	43	4.00	0.56
	6-10	30	4.09	0.56
	Above 10	50	3.83	0.75
Empowering Learners	1-5	43	3.99	0.42
	6-10	30	3.82	0.59
	Above 10	50	3.89	0.59
Facilitating Learners' Digital Competence	1-5	43	3.88	0.59
	6-10	30	3.98	0.69
	Above 10	50	3.89	0.56
overall digital competencies	1-5	43	4.00	0.42
	6-10	30	4.04	0.47
	Above 10	50	4.01	0.43

Table (15) reflects the means and standard deviation values of the sample's opinions concerning the digital competence in the International Independent School with respect to the respondent's teaching experience' category. It was obvious that the means values are different among the different teaching experience categories. In order to explore the statistical significance of the means differences one-way ANOVA was utilized. The results are merged in table (16) below.

Table (16)
Results of one way-ANOVA for the for the digital competence in the International Independent School based on teaching experience

Competencies	Variation source	sum of squares	df	mean squares	F	sig	result
Professional Engagement	Teaching experience	.439	2	.220	.895	.411	Not sig
	error	29.446	120	.245			
	Total	29.885	122				
Digital Resources	Teaching experience	.272	2	.136	.634	.532	Not sig
	error	25.699	120	.214			
	Total	25.971	122				
Teaching and Learning	Teaching experience	.278	2	.139		.628	Not sig
	error	35.765	120	.298			
	Total	36.044	122				
Assessment Using digital technology	Teaching experience	1.447	2	.723	1.750	.178	Not sig
	error	49.594	120	.413			
	Total	51.041	122				
Empowering Learners	Teaching experience	.549	2	.274	.957	.387	Not sig
	error	34.407	120	.287			
	Total	34.956	122				
Facilitating Learners' Digital Competence	Teaching experience	.199	2	.099	.275	.760	Not sig
	error	43.367	120	.361			
	Total	43.565	122				
overall digital competencies	Teaching experience	.032	2	.016	.086	.918	Not sig
	error	22.713	120	.189			
	Total	22.746	122				

Table (16) shows the results of one way-ANOVA to investigate the significance of means differences in the digital competence in the International Independent School based on teaching experience. With the "ANOVA" test, a significance value was provided. referring to the significance values for the Professional Engagement competency it was (0.411), for the Digital Resources competency it was (0.532), for the Teaching and Learning competency it was (0.628), in the same context, the significance value pertaining the Assessment Using digital technology was found to be (0.178), for the Empowering Learners competency it was (0.387) and for the Facilitating Learners' Digital Competence it reaches (0.760).the significance value revealed by the overall

digital competencies it was (0.918). When comparing the obtained significance values to 0.05 it was clear that all the provided significance values were greater than 0.05; suggesting no significance means differences in the digital competencies according to teaching experience categories. Accordingly, no significance means differences could be reported in the competencies with respect to teaching experience.

CHAPTER FIVE

Results Discussion and Recommendations

5.0 Introduction

This chapter consists of a summary and a discussion of the findings of the two research questions. It also premises the new findings on previously conducted studies and theories that were reviewed. The chapter concludes with recommendations and suggestions for future research.

5.1 Discussion of the Findings of Question One

What is the digital competence the educators have?

It is crucial that schools learn how to provide an educational, didactic, and safe response to the needs of students in today's society, where new generations are expected to have an advanced level of digital competence because they are in continuous transformation, where students' learning habits have changed, where their needs and circumstances are no longer the same as they were ten years ago. This can only be accomplished when students are taught by educators who themselves have received up-to-date training and are technologically literate enough to facilitate their students' learning and the development of essential skills.

The ability to use information and communication technologies (ICT) critically, dynamically, and creatively in the classroom is what we refer to as "digital competence" in the field of education.

The results displayed in the previous chapter showed that teachers have different specialty, experience, educational level, age, and gender as shown high percentages, the mean score for the Overall Professional Engagement competence degree was (4.31).

From the perspective of the sample, this value demonstrates an extremely high degree of proficiency.

Dig.Comp was developed by the European Commission to address this issue. There is a reliance on the 2.1 structure. In order to quantify the aforementioned concepts, a scale with elements was created. This evaluation scale is considered useful for gauging the level of computer literacy among educators. As a result, instructors can't effectively and efficiently use technology in and out of the classroom or guide students in their use of technology if they don't have the skills to do so themselves. Indirectly or directly, it might affect the student's curiosity about the lesson and the student's overall academic progress. Keeping teachers' digital abilities updated ensures that they are prepared to provide students with a digital education that addresses their specific needs and challenges. As a result, assessment instruments play a crucial role in keeping tabs on teachers' digital competence and determining their current level of expertise. Therefore, it may be necessary to acquire new skills and knowledge as technology evolves. Therefore, in this research, a scale was developed to assess educators' level of digital literacy in light of today's tools.

These results align with Abuhumaid's study (2011) which implied that the educators have mastery of using digital competence tools in teaching.

The degree of overall expertise with regard to digital resources was graded by a mean of (4.08). From the perspective of the sample, this number encapsulates a high degree of proficiency in the relevant domain. This finding is not consistent with the study of Blayone et al. (2017) as he stated that neither students nor teachers are prepared for a wholly online learning environment that demands high levels of social, cognitive, and instructional presence from all parties involved in the process of education.

The mean score used to evaluate an individual's level of expertise in teaching and learning was (3.95). From the perspective of the sample, this number encapsulates a high degree of proficiency in the relevant domain. This result is incompatible with Cabero and Palacios's (2020) study which indicated that it is essential to develop individualized training programs, conduct evaluations of such programs, and raise the overall level of digital competence among educators. In a similar vein, it has been suggested that several lines of study relating to the requirements for ICT training be opened, supported by trustworthy and valid instruments for competence evaluation.

5.2 Discussion of the Findings of Question Two

Does the degree of possession of digital competencies in teaching vary according to the following variables gender, age, qualifications, major and expertise of the teachers?

The results of the current study showed no significance means differences in the digital competencies according to gender, level of education, expertise, major, and age.

To illustrate, there were no significance differences discovered in this gender role dimension, it is thus consider that gender role is a trait that has no influence on the ways in which educators perceive digital competence.

When the acquired significance values were compared to the significance level of 0.05, it became obvious that all of the obtained significance values were more than the significance level, suggesting that there are no significant means variations in the digital competences based on gender.

In regards to the contribution of the educational level to digital competence of teachers, when the acquired significance values were compared to the significance threshold of 0.05, it became obvious that all of the obtained significance values were more than 0.05. This indicates that there are no significant means variations in the digital

competences based on educational level. In terms of major variable, When the resulting values were compared to 0.05, it became obvious that all of the reported significance values were greater than 0.05. This indicates that there are no significant means variations in the digital abilities based on the major.

Pertaining to age factor, when the collected significance values were compared to 0.05, it became obvious that all of the given significance values were more than 0.05. This indicates that there are no significant means variations in the digital competences according to age groups. As a result, there were no discernible means differences that could be reported in the competences in relation to age. Finally, when the resulting significance values were compared to 0.05, it was obvious that all of the given significance values were more than 0.05. This indicates that there are no significant means variations in the digital competences based on the teaching experience categories. As a consequence of this, it was not possible to report any statistically significant mean differences in the competences with regard to teaching experience.

These results do not align with the studies of Cabero, Barroso, and Palacios (2021), Al Bataineh and Anderson (2015), and Wu, Zhou, Li, and Chen (2022). The studies showed significance differences between male and female teachers, and it revealed a positive proportional coloration between number of experiences and the degree of digital competence of teachers. However, the findings of this research are consistent with the results found in European Commission, Joint Research Centre, (2022) as the results showed that gender and age did not have a significance influence on the digital competence of teachers; however, teachers of different academic areas conveyed statistically significance difference in regards to digital competence.

As an integral part of our daily lives, phone and mail were the only means of communication; today, smartphones and tablets can be carried anywhere and are always connected to the rest of the world, just as all professions are increasingly demanding of their employees in terms of the skills they must acquire. Effective work that is suited to all people and therefore more valued, in recognition of the digital skills gaps in the teaching profession. The European Commission decided to develop a digital competence framework to provide educators with a common reference point for determining what could be evaluated and where they needed to continue developing digital competences within a scientifically sound framework that guides policy and can be directly adapted to implement regional and national training programs. Cross-border communication and the exchange of best practices The study is based on past efforts to define the digital competence of people in general, The endorsement of the skills agenda for Europe 2020's Flagship Initiative for new skill levels by digitally competent education organizations. Existing national and international frameworks, self-assessment tools, and certification schemes served as the basis for the framework's analysis, mapping, and grouping of the elements that comprise the digital competence of educators. Digital competence is demonstrated by educators' capacity to use digital technology not only to enhance instruction, but also for their professional contacts with peers. Learners, parents, and other interested parties can utilize digital educational materials for teaching for their individual professional growth as well as for the organization's and teaching profession's continual innovation and collective good. Recognizing this diversity is one of the core talents that every educator must develop in order to properly identify the learning tools that best meet their aims. Determine the group's and teacher's teaching methods, then augment their teaching and learning with digital resources. Digital technologies can enhance and improve teaching and learning strategies in a variety of ways; however, regardless of the

pedagogical strategy or approach employed, the educator's specific digital competence lies in orchestrating the use of digital technologies across the different phases and settings of the learning process. Fundamental to this domain and possibly the entire paradigm is competency educating, developing, planning, and executing the use of digital technology. When incorporating digital technologies into learning and teaching, it is important to explore how digital technologies can enhance existing assessment strategies as well as how they might be utilized to generate or enable new assessment strategies. Innovative assessment methods should be able to integrate digital technology in assessment with these two goals in mind, in order to empower students. One of the primary advantages of digital technologies in education is their capacity to enhance learner-centered pedagogical practices and increase the active engagement and ownership of students in the learning process. Digital technology can be used to assist learners' active involvement, such as when investigating a topic, experimenting with multiple possibilities or solutions, understanding connections, generating creative solutions, or making and reflecting on an artifact. Facilitating learners' digital competences is one of the transversal abilities that educators must implant in their students, whereas developing other transversal competencies is only a portion of educators' digital competence.

5.3 Conclusion

The aim of this research was to investigate the level of digital competences of educators in the private school sector.

We conducted an online survey to create a questionnaire based on the DigCompEdu framework and its assessment tool in order to answer research questions regarding the level of digital competencies among private school educators and the relationship between digital competencies and other demographic information.

It has been found that most educators have a high level of digital competence in the six areas of the DigCompEdu framework: professional engagement; digital resources; teaching and learning; assessment; learner empowerment; and learner facilitation.

Regarding professional engagement, educators can utilize digital technology to connect and interact with colleagues and students, as well as for the common good and ongoing innovation in the organization and teaching profession. The majority of participants "choose, modify, and combine diverse digital solutions to effectively interact and exchange ideas and information with teachers outside their company" (e.g., in an online teaching network). In addition, they "use a variety of resources to enhance their digital teaching abilities and discuss with their colleagues how to use digital technology to innovate and improve educational practice as well as grow their digital teaching skills." Regarding engagement in online training possibilities, such as online courses and webinars, the majority "have participated in online training at least once or twice and have experimented with a variety of online training opportunities."

Data obtained indicated that teachers use digital competence because it is easier to use these tools while teaching in order to facilitate the teaching process, and they feel more comfortable when they use digital competence tools within the classroom environment, therefore they use digital competence tools to avoid misunderstanding, express objectives, fill in gaps, and discuss knowledge-related issues. Because the teachers work at an international school, they are urged to use digital competence tools while teaching. Finally, there are no significance difference among the variables of expertise, major, age, gender, and educational level in regards to digital competence.

This study has contributed to the growing body of knowledge in the field of technology integration and teachers of different subjects particularly in Jordan. To this

end, the study investigated teachers' evaluation of competency needed for implementing technology in the International Independent School.

This study found that the male teachers had the highest mean of perceptions of competency needed for implementing technology in classrooms, but the different was not statistically significant. This study also showed that teachers who had 30 to 39 of teaching experience showed higher perceptions of competency for implementing technology in classrooms than the teachers who had or those teachers who had 40 years and more of teaching experience, while teachers who teach sciences had lower perceptions of competency scores than Humanities teachers; however, the difference of all variable means were not statistically significant.

Finally, this current study identified predictors of teachers' perceptions of competency to implement technology based on the variables of gender, grade-level taught and teaching experience. These variables are clear in the literature with some other factors that might impact the perception toward integrating technology.

This study is a preliminary step in this area and the researcher plans to conduct further investigations into the factors that might affect technology integration in Jordan and other developing countries. The researcher also hopes that this study will help principals, administrators, teachers, and parents to understand teachers' attitudes and perceptions concerning the competency needed to implement technology. This, in turn, will lead to professional development and the improvement of technology resources for teachers.

5.4 Recommendations Suggestions for Future Research

On the bases of the results of this study, the researcher proposes a number of points to be taken into consideration by other researchers:

The study may be expanded to cover different regions in Jordan. The sample may include the different occupations and ages for the purpose of differentiating various speech communities (i.e. a group of people sharing a common language or dialect), For pedagogical purposes, the sample can be expanded to include parents and teachers along with students to study all the domains that can affect students' learning environments and their pedagogical behaviors in relation to technology, and to address the students' needs and their digital abilities.

As technology advanced and society became aware of the need for new skills, the idea of digital competence began to take shape. The value of digital competence must always be viewed in connection to the present technology and its application because technological development always enables and produces new activities and aims.

5.4.1 Practical knowledge:

At the moment, Educators assessments place a greater emphasis on access and consumption than on actual digital skills (i.e. measuring quality, attitudes and strategies for the use of technology). The first step in mastering sophisticated digital abilities is managing simple digital tools and online platforms. Digital competence development should be viewed as a progression from instrumental skills toward more productive, communicative, critical, and strategic competencies.

To have digital competence is to have the knowledge, skills, and attitudes necessary to use digital technologies competently, appropriately, securely, critically, creatively, independently, and ethically to carry out tasks, solve problems, communicate, manage information, collaborate, and create and share content.

The ability to utilize technology to execute activities, solve problems, communicate, manage information, collaborate, as well as create and share content effectively, properly,

securely, critically, creatively, autonomously, and ethically is known as digital competence. What is better to use, than S.M.A.R.T GOALS and applying them in technology use for educators.

5.4.2 Learning Continuum.

Examining the concept's foundation in greater detail is important in order to map digital competence. Digital competence, according to some, goes beyond simply knowing how to operate a digital platform.

The ability to combine the information, abilities, and attitudes suited to the situation should be defined as digital competence. Consequently, the following fields make up digital competence:

1) Practical knowledge of digital tools and media
2) Technical information, theories, and guidelines.
3) Approaches toward tactical usage, independence, flexibility, cognitive comprehension, and innovation.

The learning continuum refers to these three dimensions, which the researcher translated into more straightforward equivalents to facilitate educators' adaptation. The equivalents are:

1) Technical Hands: To utilizing online means and resources.
2) S.M.A.R.T brain: To enhance knowledge, and concepts.
3) Technological mindset: To open, critical, imaginative, responsible, and self-reliant.

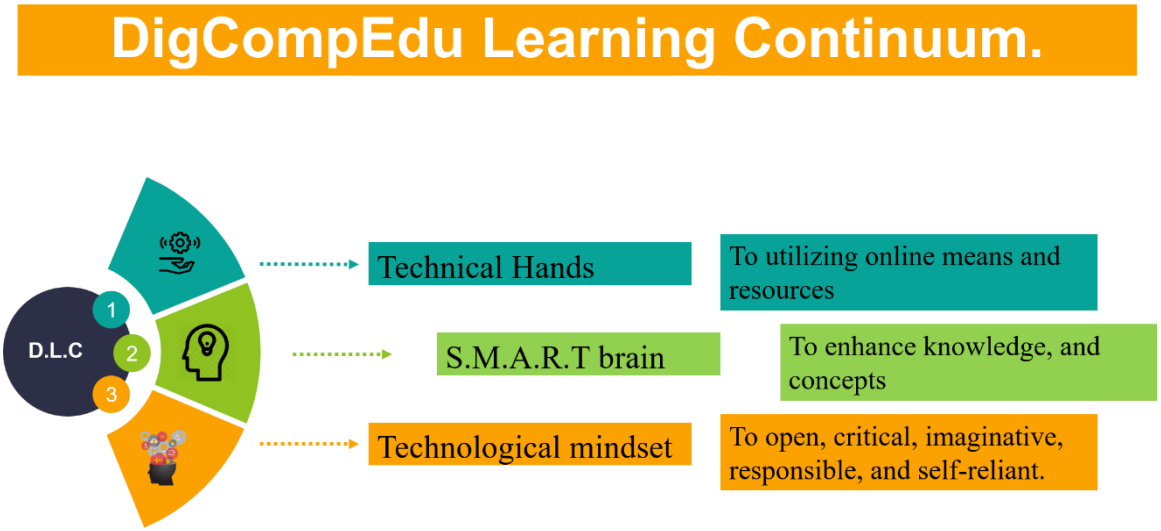


FIGURE 3: DigCompEdu Learning Continuum

References

Abuhmaid, A. (2011). ICT training courses for teacher professional development in Jordan. *Turkish Online Journal of Educational Technology-TOJET*, *10*(4), 195-210. [ERIC]

Al Bataineh, M., & Anderson, S. (2015). Jordanian social studies teachers' perceptions of competency needed for implementing technology in the classroom. *Contemporary Educational Technology*, *6*(1), 38-61.[Google Scholar]

Alarcón, R., Del Pilar Jiménez, E., & de Vicente- Yagüe, M. I. (2020). Development and validation of the DIGIGLO, a tool for assessing the digital competence of educators. *British Journal of Educational Technology*, *51*(6), 2407-2421.[Research Gate]

Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. *International education studies*, *3*(2), 211-218. [ERIC]

Awdeh, S. (2010). Measurement and evaluation in the teaching process. *In Measurement and evaluation in the teaching process*. Dar AlAmal for publishing. [MOE]

Basilotta Gómez-Pablos, V., García-Valcárcel Muñoz-Repiso, A., Casillas Martín, S., & Cabezas González, M. (2020). Evaluación de competencias informacionales en escolares y estudio de algunas variables influyentes. *Revista Complutense de Educación*, *4*(31), 517-528.[Udima]

Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L. A., & Otto, A. (2022). Teachers' digital competencies in higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education*, *19*(1), 1-16.[Google Scholar]

Bennett, E. (2014). Learning from the early adopters: Developing the digital practitioner. *Research in Learning Technology*, *22*, 21453.[Google Scholar]

Blayone, T. J., Mykhailenko, O., vanOostveen, R., Grebeshkov, O., Hrebeshkova, O., & Vostryakov, O. (2018). Surveying digital competencies of university students and professors in Ukraine for fully online collaborative learning. *Technology, Pedagogy and Education*, *27*(3), 279-296.[Google Scholar]

Blevins, B. (2018). Teaching digital literacy composing concepts: Focusing on the layers of augmented reality in an era of changing technology. *Computers and Composition*, *50*, 21-38.[Google Scholar]

Broadbent, J., Panadero, E., Lodge, J. M., & de Barba, P. (2020). Technologies to enhance self-regulated learning in online and computer-mediated learning environments. *Handbook of Research in Educational Communications and Technology: Learning Design*, 37-52.[Google Scholar]

Brown, A. L., & Palincsar, A. S. (2018). Guided, cooperative learning and individual knowledge acquisition. In *Knowing, learning, and instruction* (pp. 393-451). Routledge.[Google Scholar]

Cabero-Almenara, J., & Palacios-Rodríguez, A. (2020). Marco Europeo de Competencia Digital Docente «DigCompEdu». Traducción y adaptación del cuestionario «DigCompEdu Check-In». *Edmetic*, *9*(1), 213-234.[UCO]

Cabero-Almenara, J., Gutiérrez-Castillo, J. J., Palacios-Rodríguez, A., & Barroso-Osuna, J. (2022). Comparative European DigCompEdu Framework (JRC) and Common Framework for Teaching Digital Competence (INTEF) through expert judgment. *Texto Livre, 14*.[SCIELO]

Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu). *European Journal of Education*, *54*(3), 356-369.[Google Scholar]

Çebi, A., & Reisoğlu, İ. (2020). Digital competence: A study from the perspective of pre-service teachers in Turkey. *Journal of New Approaches in Educational Research (NAER Journal)*, *9*(2), 294-308.[Google Scholar]

Cefai, C., Bartolo, P. A., Cavioni, V., & Downes, P. (2018). Strengthening social and emotional education as a core curricular area across the EU: A review of the international evidence. [Google Scholar]

Cervera, M. G., Cantabrana, J. L. L., & Rodríguez, M. U. (2021). Validation of a tool for self-evaluating teacher digital competence. *Educación XX1*, *24*(1), 353-373.[Google Scholar]

Chien, M. T. (2012). How digital media is transforming education. *How Digital Media is Transforming Education (September 4, 2012)*.[Google Schoar]

Colefax, A. P., Butcher, P. A., Pagendam, D. E., & Kelaher, B. P. (2019). Reliability of marine faunal detections in drone-based monitoring. *Ocean & coastal management*, *174*, 108-115.[Google Scholar]

Coughlan, T., Lister, K., Seale, J., Scanlon, E., & Weller, M. (2019). Accessible inclusive learning: Foundations. *Educational visions: Lessons from*, *40*, 51-73.[Google Scholar]

Coyle, V. C., Newman, D. L., & Connor, K. A. (2017). Innovative instruction in STEM education: The role of student feedback in the development of a flipped classroom. In *Blended Learning: Concepts, Methodologies, Tools, and Applications* (pp. 155-180). IGI Global.[Research Gate]

Creemers, B. P., & Kyriakides, L. (2006). Critical analysis of the current approaches to modelling educational effectiveness: The importance of establishing a dynamic model. *School effectiveness and school improvement*, *17*(3), 347-366.[Research Gate]

Crompton, H., Burke, D., & Gregory, K. H. (2017). The use of mobile learning in PK-12 education: A systematic review. *Computers & Education*, *110*, 51-63..[Google Scholar]

Esteve-Mon, F. M., Llopis-Nebot, M. Á., & Adell-Segura, J. (2020). Digital teaching competence of university teachers: A systematic review of the literature. *IEEE*

Revista Iberoamericana de Tecnologías del Aprendizaje, *15*(4), 399-406.[Google Scholar]

Esteve-Mon, F., Llopis, M., & Adell-Segura, J. (2020). Digital competence and computational thinking of student teachers. *International Journal of Emerging Technologies in Learning (iJET), 15*(2), 29-41. [Google Scholar]

Evangelinos, G., & Holley, D. (2015). A Qualitative Exploration of the DIGCOMP Digital Competence Framework: Attitudes of students, academics and administrative staff in the health faculty of a UK HEI. *EAI Endorsed Transactions on e-Learning, 2*(6).[Google Scholar]

Fernanda, M., Saavedra, C., Pilar, P. D., Barrios, M., & Zea, C. (2013). Competencias TIC para el desarrollo Profesional Docente. *Bogotá: Ministerio de Educación Nacional*.[Google Scholar]

Griffin, P., & Care, E. (Eds.). (2014). *Assessment and teaching of 21st century skills: Methods and approach*. Springer.[Google Scholar]

Gudmundsdottir, G. B., & Hatlevik, O. E. (2018). Newly qualified teachers' professional digital competence: implications for teacher education. *European Journal of Teacher Education*, *41*(2), 214-231.[Google Scholar]

Guitert, M., Romeu, T., & Baztán, P. (2021). The digital competence framework for primary and secondary schools in Europe. *European Journal of Education*, *56*(1), 133-149.[Google Scholar]

Gutiérrez Castillo, J. J., Cabero Almenara, J., & Estrada Vidal, L. I. (2017). Diseño y validación de un instrumento de evaluación de la competencia digital del estudiante universitario. *Revista Espacios, 38 (10)*.[Google Scholar]

Halawi, L. A., McCarthy, R. V., & Pires, S. (2009). An evaluation of e-learning on the basis of Bloom's taxonomy: An exploratory study. *Journal of Education for Business*, *84*(6), 374-380.[Google Scholar]

Hazar, E. (2019). A Comparison between European Digital Competence Framework and the Turkish ICT Curriculum. *Online Submission*, *7*(4), 954-962[ERIC] .

Hepp, P., Hinostroza, J. E., Laval, E., & Rehbein, L. (2004). *Technology in schools: Education, ICT and the knowledge society* (pp. 30-47). World Bank, Distance & Open Learning and ICT in Education Thematic Group, Human Development Network, Education.[Google Scholar]

Hernández Suárez, C. A., Arévalo Duarte, M. A., & Gamboa Suárez, A. A. (2016). Competencias TIC para el desarrollo profesional docente en educación básica. *Praxis & Saber*, *7*(14), 41-69. [Google Scholar]

Jenkins, H. (2006). *Fans, bloggers, and gamers: Exploring participatory culture*. nyu Press.[Google books]

Jhurree, V. (2005). Technology integration in education in developing countries: Guidelines to policy makers. *International Education Journal*, *6*(4), 467-483.[ERIC]

Johnson, A. M., Jacovina, M. E., Russell, D. G., & Soto, C. M. (2016). Challenges and solutions when using technologies in the classroom. In *Adaptive educational technologies for literacy instruction* (pp. 13-30). Routledge.[Google Scholar]

Kassim, H., Peterson, J., Bauer, M. W., Connolly, S., Dehousse, R., Hooghe, L., & Thompson, A. (2013). *The European Commission of the twenty-first century*. OUP Oxford.[Google books]

Kay, R. H. (2006). Evaluating strategies used to incorporate technology into preservice education: A review of the literature. *Journal of research on technology in education*, *38*(4), 383-408.[Google Scholar]

Kuzminska, O., Mazorchuk, M., Morze, N., Pavlenko, V., & Prokhorov, A. (2019). Study of digital competence of the students and teachers in Ukraine. In *Information and Communication Technologies in Education, Research, and Industrial Applications: 14th International Conference, ICTERI 2018, Kyiv, Ukraine, May 14-17, 2018, Revised Selected Papers 14* (pp. 148-169). Springer International Publishing.[Research Gate]

Kvavik, R. B. (2005). Convenience, communications, and control: How students use technology. *Educating the net generation*, *1*(2005), 7-1.[Google Scholar]

Levano-Francia, Luz, Sebastian Sanchez Diaz, Patricia Guillén-Aparicio, Sara Tello-Cabello, Nancy Herrera-Paico, and Zoila Collantes-Inga. "Competencias digitales y educación." *Propósitos y representaciones* 7, no. 2 (2019): 569-588.[scielo]

Lund, A., Furberg, A., Bakken, J., & Engelien, K. L. (2014). What does professional digital competence mean in teacher education?. *Nordic journal of digital literacy*, *9*(4), 280-298.[Google Scholar]

Meyer, O., & Coyle, D. (2017). Pluriliteracies Teaching for Learning: conceptualizing progression for deeper learning in literacies development. *European Journal of Applied Linguistics*, *5*(2), 199-222.[Google Scholar]

Mora-Cantallops, M., INAMORATO DOS SANTOS, A., Villalonga-Gómez, C., LACALLE REMIGIO, J. R., CAMARILLO CASADO, J., SOTA EGUIZÁBAL, J. M., ... & RUIZ MARTÍNEZ, P. M. (2022). The digital competence of academics in Spain. *A Study Based on the European Frameworks DigCompEdu and OpenEdu. EUR, 31127* [Europa]

Pérez-Escoda, A., García-Ruiz, R., & Aguaded, I. (2019). Dimensions of digital literacy based on five models of development/Dimensiones de la alfabetización digital a partir de cinco modelos de desarrollo. *Cultura y educación*, *31*(2), 232-266.[Google Scholar]

Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu* (No. JRC107466). Joint Research Centre (Seville site).[Google Scholar]

Redecker, C., & Punie, Y. (2017). Digital Competence of Educators. *Joint Research Centre-JRC: Luxembourg*, 95.[Google Scholar]

RODRIGUEZ-GARCIA, A. M., AZNAR, I., CACERES, P., & GOMEZ, G. (2019). Digital competence in higher education: analysis of the impact of scientific production indexed in Scopus database. *Revista Espacios*, *40*(21).[Google Scholar]

Rodríguez-García, A. M., Raso Sanchez, F., & Ruiz-Palmero, J. (2019). Digital competence, higher education and teacher training a meta-analysis study on the Web of Science. *Pixel-BIT-Revista de Medios y Educación*, (54), 65-81.[Google Scholar]

Romero-Rodríguez, L. M., Contreras-Pulido, P., & Pérez-Rodríguez, M. A. (2019). Media competencies of university professors and students. Comparison of levels in Spain, Portugal, Brazil and Venezuela/Las competencias mediáticas de profesores y estudiantes universitarios. Comparación de niveles en España, Portugal, Brasil y Venezuela. *Cultura y educación*, *31*(2), 326-368.[Google Scholar]

Ruiz Cabezas, A., Medina Domínguez, M. D. C., Pérez Navío, E., & Medina Rivilla, A. (2020). University teachers' training: the Digital Competence. *Pixel-Bit*.[Google Scholar]

Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st-century teaching. *Phi Delta Kappan*, *94*(2), 8-13.[Google Scholar]

Sales, D., Cuevas-Cerveró, A., & Gómez-Hernández, J. A. (2020). Perspectives on the information and digital competence of Social Sciences students and faculty before and during lockdown due to Covid-19. [Google Scholar]

Santos, C., Pedro, N., & Mattar, J. (2021). Digital competence of higher education professors:: analysis of academic and institutional factors. *Obra digital*, (21), 69-92.[Google Scholar]

Swarts, G. P. (2020). Re/Coding Global Citizenship: How Information and Communication Technologies Have Altered Humanity and Created New Questions for Global Citizenship Education. *Research in Social Sciences and Technology*, *5*(1), 70-85.[Google Scholar]

Tornero, J. M. P., Sánchez, M. O. P., Baena, G., Luque, S. G., Tejedor, S., & Fernández, N. (2010). Trends and models of Media literacy in Europe: Between digital competence and critical understanding. *Anàlisi: Quaderns de comunicació i cultura*, (40), 85-100.[Google Scholar]

Wu, D., Zhou, C., Li, Y., & Chen, M. (2022). Factors associated with teachers' competence to develop students' information literacy: A multilevel approach. *Computers & Education, 176,* 104360. [Google Scholar]

Zhou, S., & Song, H. (2022). Exploring teacher educators' post-pandemic intention to teach online in mainland China: the social cognitive career theory perspective. *Journal of Education for Teaching*, *48*(4), 424-440.[Google Scholar]

Appendices

Appendix A
Teachers' Questionnaire

To whom it may concern,

The researcher is conducting a research entitled “Evaluating the digital competence in the Jordanian private schools in light of the European digital competence framework approach” ,to complete the requirements for obtaining a master's degree.

Given that you are an educator at the International Independent Schools, Kindly fill out the attached survey by putting a tick sign in the right place in every item of the survey.

Note that the answers that you will provide will be treated strictly confidential and will only be used for scientific research purposes.

Thank you for your kind cooperation
Supervisor: Dr. Mohammed H. Alsamkari the Researcher: Hala AbouJabal

Part 1: Demographic Information:	
1	Gender
Male	
Female	
2	Age
21-29	
30-39	
above 40	
3	Qualifications
Undergraduate degree	
Graduate degree	
4	Major
Sciences	
English and humanities	
5	Years Of TEACHING Experience
1-5	
6-10	
Above 10	

Part Two: Questionnaire

Digital competency areas to be measured:

Criteria / Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagreed
Area 1: Professional Engagement					
I routinely make use of digital tools including email, the institution portal, and apps to improve my interactions with students and colleagues.					
I utilize many types of technology to collaborate with educators inside my institution.					
I'm committed to improve my digital pedagogy.					
I make use of distance learning capabilities like MOOCs, webinars, and virtual conferences.					
Area 2: Digital Resources					
I go through results from various online databases and use a number of search methods to choose a wide variety of useful digital materials.					
The digital tools are always up-to-date to suit my specific requirements.					
To understand the use and creation of open licenses and open educational resources, including their proper attribution.					
I choose educational digital services that are useful for learners and educators.					
I regularly engage in virtual forums and social networks for professional development.					
Area 3: Teaching and Learning					
I carefully evaluate how, when, and why to utilize digital tools in education to ensure that they offer value.					
I keep track of my students' activities and interactions in the collaborative online settings in which we work.					
My classes often work in teams, and when they do, they utilize various forms of digital technology to collect and record information.					
I implement digital tools that give students control over their own learning process, including self-assessment tests, e-Portfolios, online journals, and online discussions.					

Criteria / Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagreed
Area 4: Assessment Using digital technology					
I check up on my students' development using online assessment tools.					
I evaluate all of the information I have about my students, such as their participation, performance, grades, and attendance, as well as their activities and social connections in (online) settings, to determine personal and academic abilities.					
I use online tools to give useful feedback.					
Area 5: Empowering Learners					
I take into account and try to remedy any digital issues when designing digital assignments for students, such as lack of digital skills or insufficient access to digital devices and resources.					
I customize my students' educational experiences by using digital tools; for instance, I provide unique digital assignments to each student so that I may cater to their specific requirements.					
To get my students involved in class discussions and activities, I rely on digital tools.					
Area 6: Facilitating Learners' Digital Competence					
I instruct my students on how to determine whether or not a source is credible and how to spot misinformation and other forms of prejudice.					
I give them tasks that require accessing to the internet, either group work or individual practice, to go beyond the classroom environment.					
I give them homework that involves making something digital, such a video, audio recording, photograph, digital presentation, blog post, wiki page, etc.					
My classes focus on helping students learn to navigate the internet in a responsible manner.					

Appendix B
Mission facilitation letter

بسم الله الرحمن الرحيم

وزارة التربية والتعليم

الرقم: ١٢٠٩٨١١/١١

التاريخ: ٢٠ ربيع الثاني ١٤٤٤

الموافق: ٢٠٢٢/١١/١٥

السيد مدير مدرسة المستقله الدولية / خلدا

الموضوع/ تسهيل مهمة

السلام عليكم ورحمة الله وبركاته، وبعد،

فأرجو اعلامكم بأن الطالبة (حلا علي احمد أبو جبل) تقوم باجراء دراسة بعنوان " Evaluating the digital competence in the Jordanian Private schools in light of theEuropean digital competence framework approach".

وستقوم بتطبيق أداة الدراسة على عينة من المعلمين في مدرستكم .

راجياً تسهيل مهمتها ومطابقة الأداة المطبقة مع الأداة المرفقة، شريطة مراعاة الاشتراطات الصحية وألا تستخدم البيانات والمعلومات إلا لأغراض البحث العلمي.

وتقبلوا الاحترام

وزير التربية والتعليم

مدير مديرية الخدمات التعليمية
آفاق صالح الرمامنه

جـامـعـة الـشـرق الأوسـط
MEU MIDDLE EAST UNIVERSITY
Amman - Jordan

مكتب رئيس الجامعة
Office of the President

الرقم، د ر/ خ/613
التاريخ، 2022/11/12

معالي الأستاذ الدكتور عزمي محمود محافظة الأكرم
وزير التربية والتعليم العالي

تحية طيبة وبعد،

فتهديكم جامعة الشـرق الأوسـط أطيب التحيات وأصـدق الأمنيات، وحيث إنَّ المسـؤولية المجتمعية قيمة أساسية في تحقيق رسالة الجامعة ورؤيتها، وبهدف تعزيز وترسيخ أسس التعاون المشترك الذي يُســـهم في تأدية الجامعة التزامها نحو خدمة المجتمع المحلي وتنميته، يرجى التكرم بالموافقة على تقديم التسهيلات الممكنة للطالبة **حلا علي أحمد أبو جبل** ورقمها الجامعي (**402030015**) المسجلة في برنامج ماجسـتير **تكنولوجيا المعلومات والاتصـالات في التعليم/ كلية الآداب و العلوم التربوية**؛ والتي تتولى القيام بتوزيع اسـتبانات في المدارس المسـتقلة في عمان؛ لاسـتكمال رسـالتها الجامعية والموسومة بعنوان **Evaluating the digital competence in the Jordanian Private schools in light of the European digital competence framework approach** علمًا أنّ المعلومات التي ستحصل عليها ستبقى سرية ولن تُستخدم إلاّ لأغراض البحث العلمي.

شاكرين لكم حسن تعاونكم واهتمامكم.

وتفضلوا بقبول فائق الاحترام والتقدير...

رئيسة الجامعة

أ.د. سلام خالد المحادين

المملكة الأردنية الهاشمية
ديوان وزارة التربية والتعليم
الرقم،
١٥ تشرين الثاني ٢٠٢٢
إلى مدير إدارة،

Tel. (+9626) 4790222 Fax: (+9626) 4129613 P.O.Box. 383 Amman 11831 Jordan e-mail: dir-presdepart@meu.edu.jo
www.meu.edu.

Appendix C
A-List of the Names of Referee Arbitrators

No.	Name	Specialization	Workplace
1	Mohammed Alheilah	PH.D. In Education Technology	Middle East University
2	Khalil Al Saeed	PH.D. In Education Technology	Middle East University
3	Sabah Alnawaiseh	PH.D. In Education Technology	Middle East University
4	Ammar Alnawaiseh	PH.D. In Education Technology	International Independent School
5	Hamzeh Al-Assaf	PH.D. In Education Technology	Middle East University
6	Rula Al-Saifi	PH.D. In Education Technology	Middle East University
7	Shereen AbuHait	PH.D. In linguistics	Sands Independent School
8	Hounaida Alshami	Master Degree in Educational Management	International Independent School
9	Samir Al-shalaan	International Math Coordinator	International Independent School
10	Lamees Tayoon	Master Degree In Education Technology	Al Bayan Private School