The Perceptions of Arabic Language Teachers and Leaders on Student Experience with Digital Learning During the COVID-19 Pandemic

تصورات معلمي وقادة مادة اللغة العربية حول خبرات الطلاب في التعلم الرقمي أثناء جائحة كورونا

by

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Dissertation submitted in fulfilment

of the requirements for the degree of

MASTER OF EDUCATION

at

The British University in Dubai

December 2020

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Abstract

Background: This study was designed to explore the perceptions of Arabic language teachers and leaders on their students' experience with digital learning during the COVID-19 Pandemic in three high-performing private schools in Dubai.

Methodology: The study adopted a mixed-method approach that utilized a quantitative-qualitative questionnaire and semi-structured interviews for data collection as well as document analysis.

Results: Analysis of the questionnaire findings revealed that Arabic teachers shared considerably positive perceptions towards their students' engagement in digital learning against four of the seven standards of the International Society for Technology in Education (ISTE), namely Empowered learner, Digital citizen, Creative Communicator and Knowledge Constructor. These findings were supported by data obtained from interviews with their Arabic leaders who adapted flexible leadership approaches to facilitate the achievement of these outcomes. However, the Innovative Designer, Computational Thinker and Global Collaborator standards showed less frequency of application by students from the perspective of their teachers and leaders. Despite notable attempts, results indicated that the latter three standards were not substantially reflected in practice before the pandemic, but intensive exposure to digital learning during school closure predicted promising potential for these schools to meet international standards in a relatively short period of time. This remarkable performance of the participating schools can be used as a benchmark for other schools aspiring to unlock the potential of technology in their learners. Therefore, this study analysed the UAE's Distance Learning Evaluation Tool. Data obtained from this document analysis, along with findings from the questionnaire and interviews, were used to inform the development of Reality-Based Assessment Criteria for digital learning. These criteria were recommended for consideration as a precursor transitional step towards a more sustainable assessment of digital learning.

Recommendations: The study recommends practitioners view the ISTE Standards from a progressive and incremental perspective rather than a discrete one. This is because teachers' responses rated these standards according to the complexity of skills involved in each standard. It also recommends that future research initiatives may conduct predictive analytics of teachers and students' digital learning aptitudes to envision technology integration after the pandemic.

ملخص الدراسة

خلفية الدراسة: صُممت هذا الدراسة بهدف استكشاف تصورات معلمي وقادة مادة اللغة العربية حول خبرات طلابهم مع التعلم الرقمي أثناء جائحة كورونا في ثلاث مدارس خاصة عالية الأداء في إمارة دبي.

منهجية البحث: وظفت الدراسة منهجية بحثية مختلطة جمعت بين الأسلوبين الكيفي والكمي في الاستبيان والأسلوب الكيفي في المقابلات شبه المقيدة، بالإضافة إلى أسلوب تحليل الوثائق.

النتائج: أظهر تحليل نتائج الاستبيان تصورات إيجابية ملحوظة حول انخراط الطلاب في التعلم الرقمي قياسًا إلى أربعة معايير من المعايير السبعة للجمعية الدولية للتكنولوجيا في التعليم (ISTE)، وهي على النحو التالي: تمكين المتعلم والمواطنة الرقمية والتواصل الإبداعي وبناء المعرفة. كما دعم هذه النتائج البيانات المستمدة من المقابلات مع قادة مادة اللغة العربية الذين تبنّوا أنماطًا قيادية مرنة لتسهيل تحقيق نواتج التعلم ذات الصلة. وفي المقابل أظهرت الاستجابات حول معايير التصميم الإبداعي والتفكير الحاسوبي والمشاركة العالمية أن فرص تطبيقها كانت أقل تكرارًا من جانب الطلاب وفقًا لتصورات معلميهم وقادة المادة. وبالرغم من المحاولات الملحوظة فقد أظهرت النتائج أن المعايير الثلاثة الأخيرة لم تنعكس بصورة واضحة في الممارسات التدريسية قبل الجائحة، لكن التعرض المكثف للتعلم الرقمي أثناء غلق المدارس يُنبئ عن فرص واعدة لتلك المدارس في تلبية المعايير الدولية في فترة وجيزة نسبيًّا. كما يمكن للأداء الجدير بالاعتبار لهذه المدارس أن يستخدم كمؤشر مرجعي لغيرها من المدارس التي تطمح إلى تفجير الطاقات التكنولوجية لدى طلابها. لذا، قامت الدراسة بتحليل أداة تقييم التعلم عن بعد في دولة الإمارات، وقادت نتائج هذا التحليل، بالإضافة إلى ما أسفرت عنه نتائج الاستبيان والمقابلات، إلى تطوير معايير تقييم للتعلم الرقمي مبنية على الواقع الحالي. وتقترح الدراسة الاعتداد بتلك المعايير كمؤشر أولي وخطوة مرحلية نحو تطوير تصور أكثر استدامة حول تقييم مهارات التعلم الرقمي.

التوصيات: اقترحت الدراسة على الممارسين التربويين أن يراجعوا معايير الجمعية الدولية للتكنولوجيا في التعليم من منظور تدريجي وتراكمي، حيث إن استجابات المعلمين رتبت هذه المعايير وفقًا لدرجة تعقد المهارات المتضمنة في كل معيار. كما توصي الدراسة بأن تهتم المبادرات البحثية المستقبلية بإجراء تحليلات تنبؤية حول استعدادات المعلمين والطلاب لتوظيف التعلم الرقمي، وذلك بهدف استشراف دمج التكنولوجيا في التعلم بعد انقضاء الجائحة.

الكلمات المفتاحية: فيروس كورونا، التعلم الرقمي، التعلم عن بعد، انتشار المبتكرات، النظرية الترابطية، التفكير التصميمي، معايير الجمعية الدولية للتكنولوجيا في التعليم.

ACKNOWLEDGEMENT AND DIDICATION

I would like to pay tribute to the British University in Dubai for facilitating this fruitful learning journey throughout my enrolment in the Master of Education programme. I also extend my thanks to all the professors who taught and guided me during this time while singling out the supportive and constructive feedback on my dissertation by Dr. Emad Abu-Ayyash who sparked the crafting of this study for further depth and enrichment. A special thanks goes to the school leaders and teachers who participated in this study and extensively powered this work up with valuable data in a critical period of time. My sincere thanks also extend to my friend Yousef Omar for his motivational support.

I dedicate this work to my brothers, my mother and particularly my father, the kindest soft-hearted loving person on earth. He always dreamed to hear the news of my master graduation despite not being able to celebrate together due to travel restrictions imposed by the pandemic.

An indescribable and incomparable dedication goes to REEM, the loyal friend, the faithful companion, the life partner and the lovely wife. She has always been my second half who spared no effort to surround me with her unconditioned love and support . She is the one without whom my success and dreams will be meaningless and insignificant. Her mere existence besides me is a driving force to never feel intimidated or disappointed.

To my loving son, Shadi: Allah only knows how much we love you. We promise you to do everything we can for your happiness and wellbeing. Your mom and dad are looking for the day when you will feel so proud of them and are hoping to leave you a legacy that illuminates your way forward.

Table of Contents

CHAPTER 1: INTRODUCTION

1.1 Background and Context

With the outbreak of the COVID-19 Pandemic, various aspects of life have negatively and significantly changed, including retirement, parenthood and schooling (Jetten et al., 2020). This caused a lot of businesses to shut down while others already flourished. As a result, employment index in several countries tremendously declined due to this unprecedented phenomenon (OECD, 2020). This extended to the education sector at all levels which shifted completely online (Mallya and D'Silva, 2020) and later on at certain regions, blended learning interventions were planned and implemented . Although many schools experienced immense hardships to acclimate themselves to the new situation, others successfully managed to adapt with varying degrees of adaptation. The ability for a school to cope with the situation was contingent upon whether they faced the new normal with digital learning preparedness as well as executing other necessary measures (Turhan et al., 2020).

Digital learning refers to the application of technology that fosters students' learning in any subject matter (Carrier, Damerow and Bailey, 2017). To avoid using it interchangeably, digital learning is distinguished from other related concepts such as e-learning, online learning, virtual learning, mobile learning and distance learning (Mentor, 2018). The latter terms can be viewed as subsets of digital learning, and they describe learning that takes place through the delivery of a particular content via the internet and other electronic media (Kumar Basak, Wotto and Bélanger, 2018). Alternatively, digital learning is a more comprehensive concept that refers to any type of learning supported by technology or instructional practices which makes effective use of the technology available which happens in all learning fields and domains (Victoria State Government, 2019). From this standpoint, digital learning is learning that results from the interaction with and exploitation of technological tools, whether it is executed online, offline, remotely or face-to-face. In order for digital learning to effectively happen, digital knowledge and skills need to be acquired and mastered.

During the COVID-19 Pandemic, all schools in the UAE were requested on 31 March 2020 to adopt distance learning in compliance with the circulation shared with all educational institutions (KHDA

2020). By the new school year on 31 August 2020, UAE schools were given flexible options to facilitate a blended learning approach. As already pointed out, digital learning is an umbrella term that combines all forms of learning that use digital technology to promote student learning. This includes distance and blended learning. Thus, the success of distance/blended learning is highly dependent on the degree to which schools, leaders, teachers and students are well-equipped and exhibit positive attitudes towards the use digital tools.

Before the pandemic, schools in the UAE experienced the use of digital tools in teaching and learning with varying degrees in one way or another. With the surge of COVID-19, schools had no other choices but to use their pre-existing infrastructure, including manpower and digital readiness, in order to address the emerging situation. School staff and students had to apply their existing knowledge and skills of digital learning to enhance the compelling engagement with distance learning and/or blended learning adopted at a later stage by some schools in countries that took effective measures to contain the virus. Since the WHO declared COVID-19 as pandemic on 11 March 2020, UAE school teachers, leaders and students began to prepare for the new learning experience. During this time, the three key players in the learning scene had presumably developed different perspectives towards the use of digital tools in a highly pressing, challenging and temporary distance/blended learning atmosphere, with the hope to transfer their new perspectives, knowledge and skills to a permanent normal educational setting as soon as the pandemic would come to an end.

Driven by this motivation, this study targets to explore the perceptions of purposefully selected private schools' teachers on their students' implementation of digital learning during the time of COVID-19. It attempts to locate the current gains, and potentially setbacks, resulting from the digital learning experience as benchmarked against the seven standards of the International Society for Technology in Education (ISTE) for Students (ISTE, 2016). These standards were typically designed for stable educational settings where schools have the luxury to accommodate digital learning in a variety of ways. However, understanding how and where an overwhelming urge to facilitate digital learning has located high performing schools in the UAE on a continuum of international standards would inform future digital learning opportunities. Moreover, Arabic language leaders' perceptions of the implementation of digital learning and their students' experience will also be examined to help understand how their schools promoted a digitally

enhanced environment for students. As such, the study will explore the perceptions of Arabic language teachers and leaders on their students' digital learning during the COVID-19. This study will also seek to review the UAE's Distance Learning Evaluation Tool, developed during the pandemic, to examine the assessment criteria used for school inspection in order to keep pace with the expected forthcoming changes in education policies expected to take effect after the pandemic.

1.2 Statement of the Problem

Owing to the terrible repercussions of COVID-19, school leaders, teachers and students all over the world went through a ground-breaking experience that enforced changes in their normal roles and responsibilities as the key actors of the educational landscape. This change necessitated continuous adjustments and resilience by these key actors. Extensive use of digital learning was resorted to as a result of the partial and/or full closure of schools in an attempt to address the consequences of the crisis. This imposes on those concerned with education a commitment to thoroughly explore what was being practiced at this time and how school leaders and teachers faced the challenges and harnessed the digital resources for the benefit of their students.

Insufficient exploration of this new phenomenon from different perspectives may cause the educational community of research and practice to lose a momentum that will possibly contribute to remarkable advancement in teaching and learning using digital technology as well as the reshaping of education policies. In keeping with this interest, the aim of this study is to explore how students engaged with digital learning from the perspective of Arabic teachers and their heads of departments in selected high performing private schools in Dubai. It will gather their perceptions of their students' learning through surveying and interviews. It will also carry out a document analysis with the aspiration of developing precursor reality-based assessment criteria for digital learning that would probably inform a more sustainable assessment strategy for using technology in education in the UAE.

1.3 Rationale of the Study

The rationale of this study stems from the motivation to explore the perceptions of teachers and leaders on their students' use of and experience with digital learning during the COVID-19 Pandemic. The interruption of normal education life at schools imposes on those concerned about

education special responsibilities to understand what exactly happened during this time, what the gains were and what the losses were. There has always been demands to integrate technology in education in this decade. Some schools did well with technologies, others faced challenges while some others shared reasonable degrees of technology implementation. Hence, exploring the use of technology in a compelling educational setting provokes a high interest to learn more about whether it worked, how it worked, what the lessons learned were and what next steps will need to be taken.

The study attempts to understand to what extent Arabic teachers and leaders believes that students' digital academic, personal and social needs were met during the pandemic. This understanding would probably provide the education community of the UAE with predictions and insights into how teaching and learning, particularly in Arabic language, will operate when education activities return to normal. Findings of this study may inform future assessment policy making when considering digital skills as pivotal for students learning in the digital age.

1.4 Questions of the Study

The overarching aim of the present study is to explore the perceptions of Arabic language teachers and leaders on students' implementation of digital learning and to understand the current status of the assessment of digital learning. Thus, the study seeks to answer the following questions:

1. What are the perceptions of Arabic language teachers on students' implementation of digital learning against the International Society for Technology in Education (ISTE) Standards for Students?
2. What are the perceptions of Arabic language leaders on the implementation of digital learning in their schools?
3. What is the current status of digital learning assessment in the UAE's Distance Learning Evaluation Tool?

1.5 Significance of the Study

The severe impacts which the COVID-19 plague had on various facets of industries, including education, underlines the necessity of intensive research to establish a comprehensive picture of its consequences and ways to confront these consequences and maximize any possible gains. The present study seeks to contribute to this context in the field of education. This will be approached

through exploring how students' digital learning, during the partial and/or full school closure, was utilized from the perspective of Arabic language teachers and leaders. This perspective is measured against international standards of digital learning to gain deeper awareness of where schools currently are at and what necessary actions will need to be taken when education activities regain their normal course. Maintaining this standpoint may enable teachers and subject leaders in schools, particularly Arabic language, to assess the extent and level of achievement to this effect, in order to inform their near and distant future use of technology in schools. Findings of this study is expected to inform future assessment policy making when considering digital skills as essential for students' learning in the digital age. Furthermore, researchers may build on the findings of this study to evaluate relevant evidence-based practices in view of the dramatic changes to the continuum of teaching and learning during the pandemic. They might as well expand the application of this research area for more reliable and generalizable findings that provide long-lasting theoretical and practical solutions to the related issues.

1.6 Structure of Dissertation

The breakdown of this dissertation comes into seven sections. The first chapter sets the scene for the study by introducing the overall mood that generated the desire and trigger to examine this area of study. In this chapter, the rationale, questions, significance of the study is demonstrated. Chapter two addresses the theoretical foundations on which the assumptions and arguments made are built on and informs the discussion of the study findings. In this context, three main theoretical frameworks are discussed and analyzed in relation to the study objectives and what the study is attempting to investigate. Chapter three outlines the methodology pursued while conducting the study. It provides information on how the data was obtained to understand the phenomenon in question. Qualitative and quantitate data sets are used for thoughtful reflection on the findings. A document analysis is also conducted with the objective of recommending amendments to an existing policy for decision makers to consider. The methodology chapter indicates the ethical considerations taken into account prior to and during the implementation.

In chapter four, Numerical findings are presented, analyzed and discussed. Textual findings are tabulated and followed by a discussion that points out relevant observations from the data as well as key highlights which interpret the study significance and other relevant insights. This is followed

by discussing the document analysis and proposing potential amendments and/or additions. Conclusion and recommendations are introduced in chapter five to provide an explanation why this study would matter to the education community, highlighting the overall implications of the study and giving recommendation for future research and the educational community of practice. Chapter six points out the limitations of the study as relating to what is viewed as constraints regarding the application of data collection tools and utility of study results. Chapter seven lists the appendices of relevant tools and documents.

CHAPTER 2: LITERATURE REVIEW

The present study attempts to explore the perceptions on digital learning implementation in schools at a crucial time the world was experiencing. The reference benchmark to determine the characteristics and use of digital learning is the standards of the International Society for Technology in Education (ISTE) for Students. These are composed of seven standards with four performance indicators per each standard (ISTE, 2016). Indicators precisely describe what is expected from students in order to achieve each standard. In this study, the implementation of these standards is validated by examining Arabic language teachers and leaders' perspectives on their students' learning during the period of COVID-19 Pandemic. A review of digital learning and the ISTE standards will expose their underlying philosophy and principles which some of them emerged and developed in the last century while others came to light and evolved at the dawn of this century.

2.1 Conceptual Framework

2.1.1 Digital Learning

Digital learning refers to the application of technology that fosters students' learning in any subject matter (Carrier, Damerow and Bailey, 2017). To avoid using it interchangeably, digital learning is distinguished from other related concepts such as e-learning, online learning, virtual learning, mobile learning and distance learning (Mentor, 2018). The latter terms can be viewed as subsets of digital learning, and they describe learning that takes place through the delivery of a particular content via the internet and other electronic media (Kumar Basak, Wotto and Bélanger, 2018). Alternatively, digital learning is a more comprehensive concept that refers to any type of learning supported by technology or instructional practices which makes effective use of the technology available which happens in all learning fields and domains (Victoria State Government, 2019). From this standpoint, digital learning is learning that results from the interaction with and exploitation of technological tools, whether it is performed online, offline, remotely or face-to-face. In order for digital learning to effectively happen, digital knowledge and skills need to be acquired and mastered.

2.1.2 The ISTE Standards for Students

The International Society for Technology in Education (ISTE) for Students is premised on assisting students to change the way they gain their knowledge and acquire their skills (Darshan, 2019). It also promotes a teaching process which supports student engagement, meeting their individual needs (IGA Global, 2017) and building a learning environment founded on projects (Boss and Krauss, 2018) and reinforced intellectual skills (Huseyin and Ozturk, 2018), together with qualifying students to the labor market and market economy (Lennex and Nettleton, 2015). This study will consider the ISTE Standards for Students (See Appendix 1) although there were other versions of ISTE standards that were directed at teachers, schools, coaches and administrators. The underlying assumption behind this was that students' learning is the ultimate goal sought by all educational institutions. As such, the study will explore how students worked towards these standards during the pandemic. The following headings will shade light on these standards and how they can be interpreted in the context of the relevant academic literature.

2.1.3 Historical Overview of the ISTE Standards

The initial ISTE release of these standards was in 1998 entitled National Educational Technology Standards for Students (NETS•S) (IRMA, 2019). During this time, the standards focused on the formation of students' technology skills. Later in 2000 emerged the NETS for teachers followed by NETS for administrators in 2001 (Spector, 2015). NETS•S were revisited in 2007 and a new release of the standards was introduced which focused on technology integration in the classroom rather than the formation of technology skills (Ritzhaupt and Swapna Kumar, 2013). Eventually in 2016, the latest version of the standards for students was introduced in one ISTE conference (Iste.org, 2016), under the title: ISTE Standards for Students, and considered a high caliber set of digital skills.

The ISTE Standards for Students, issued in 2016, emphasized the skills and characteristics expected to be demonstrated by students to enable them to be active contributors and developers in an interconnected digital world (Williams and N Nsombi Harkness, 2019). These standards were designed to be incorporated by educators in the school curriculum with different student age groups. Teachers, students and school leaders are expected share the responsibility of achieving what each standard entails.

2.1.4 The ISTE Standards and Innovations Diffusion

By reflecting on the overall context of these standards, it can be concluded that they do not only address students' ability to deal with technology as previously addressed in earlier versions, but rather, they focus primarily on the optimization of technology resources in a world full of challenges and rapid development of knowledge and skills. Students' implementation of what these standards require to be achieved could be interpreted in light of findings from certain theories and concepts in the literature on education.

In particular, an analysis of the Diffusion of Innovation theory provides a rationale for the high expectation inferred from the ISTE Standards 2016 since the innovations diffusion of our time has trended significantly upwards. Therefore, all human societies will have to meet these expectations. Otherwise, they will lag behind in many areas of life, especially that the time taken for a certain society to adapt to a particular innovation is evidently now shorter than it was when the Diffusion of Innovation theory was first introduced in the outgoing century (O'Connell, 2018). The first two standards of the ISTE, Empowered Learner and Digital Citizen, depend essentially on the degree of students' readiness and acceptance of technology and dealing with it at a larger scale, in addition to the realization of their responsibilities when navigating technological tools as well as the commitment to ethics and duties of using them. These are preliminary essential steps before beginning to engage with a higher-level use of technology.

2.1.5 The Diffusion of Innovation Theory

The diffusion of innovation theory attempts to explain how technology and digital ideas spread and the reason why this occurs (Newell et al., 2020). Spreading, in this essence, refers to that process where innovations are transferred over time amongst those participating in a social system (Gavrilova, Tan and Abraham, 2013). There are four elements that affect the spread of a new idea: 1) the innovation itself 2) the channels of communication 3) time and 4) the critical mass (Fredrick Muyia Nafukho and Irby, 2015). Innovations do not necessarily have to be new things that are unprecedented in the history of mankind. Any new technology or idea followed by a particular society is considered a new innovation for this society and its individuals. The diffusion of innovation theory is geared towards studying patterns of human behaviours supporting a new idea

and adopting a specific behaviour (Defleur, 2017). Measuring the success of introducing a new idea to the social environment relies heavily on whether individuals accept and adapt to it.

2.1.6   Evolution of the Theory

The origins of the Diffusion of Innovation theory are found in isolated studies conducted by social researchers in several fields such as anthropology, education and agriculture to understand how farmers embraced new ideas relating to modern farming methods (Titrek and Alberto da SILVA PEREIRA, 2018). Furthermore, researchers in the field of education were interested in disseminating new teaching methods, purchasing new equipment and its use or other different areas in consideration for their impact in the prevailing social order (Bensley and Brookins-Fisher, 2009). Sociologist Everette Rogers theorized the spread of innovations in his book 'Diffusion of Innovation' in 1962, identifying four main elements of the spread of a new idea (G David Garson, 2006) as previously expressed in the preceding paragraph. His work was an extension on what other sociologists had done in the late 19th century such as Gabriel Tarde and German and Austrian anthropologists and geographers like Friedrich Ratzel and Leo Frobenius (Atkin, Hunt and Lin, 2015).

2.1.7   Education and the Diffusion of Innovation

The diffusion of Innovation theory is based on the assumption that media channels seem to be more effective in increasing and developing knowledge (Stig Ottosson, 2019). This eventually resulted in demands for using it in education. The proliferation of software industry, particularly those related to education, has led to advancements in teaching and learning. Paper books are no longer the main source of knowledge while technology has become one of the most important sources of knowledge transfer to the largest possible number of learners in different places and at the same time.

This is clearly demonstrated in various technological areas which education has taken advantage of and where software and learning platforms are used to support collaborative learning of educational subjects. Learners can also engage in questioning and feedback through interaction with each other and with the technological tool itself (Pornapit Darasawang and Hayo Reinders, 2015). Simulation software were also developed to reflect phenomena that were difficult to implement directly in the

classroom (Gibson and Youngkyun Baek, 2009). Furthermore, problem-solving technologies and those helping learners to acquire tech skills have also been developed to allow learners to solve problems relating to particular educational topics (Petrina, 2007). There are also inquiry technologies that give access to specific data which can be analyzed to gather information about certain issues (Bray, 2000). In addition, gaming technologies are used to create an entertaining and affective atmosphere of learning (Younie and Leask, 2013), and last but not least, the use of distance learning to help overcome long distances between the learners and their teachers and allowing them to interact with one another (Yates, 2003).

2.1.8 Five Stages of the Diffusion of Innovation Theory

Rogers (1995) introduced the five stages involved in the process of innovation diffusion as illustrated in the following key points:

1. **Knowledge:** Individual learns about the new technology for the first time but lacks more information about it. There are not strong triggers in this stage to search for more information about this innovation.

2. **Persuasion:** Individual's attention in the new innovation increases and start to look for more information.

3. **Decision:** Individual thinks of stage as a step for change and studies corresponding advantages and disadvantages and later on decides to accept or reject it. This stage is the most difficult and challenging stage.

4. **Implementation:** Individual uses his/her knowledge of this innovation to suit the moment they experience and may then begin to search for further information.

5. **Confirmation:** Individual conclusively decides to continue with this innovation whilst agreement is reached among groups of people who opted for this innovation as the right decision.

2.1.9 A Critical look at the Theory

Despite the academic, yet public, profile of outreach, the Diffusion of Innovation theory was subject to criticism in many ways, particularly in terms of the stages proposed in the theory. These stages were not proven to be consecutive and successive as they may suggest. Instead, an individual may jump to full adoption without going through the other stages. Moreover, the stages of adoption of new ideas are not specific or separate from one another, but often overlap and occur concurrently

(Levine, 1994). But either way, the specific stages of the theory provide a clear and detailed conceptual framework on the likelihood of experiencing these stages, whether separately or in combination with each other, by an educational institution, teachers or students. For instance, during the COVID-19 situation, the majority of schools, teachers and learners resorted to testing a great deal of technological tools hoping to cope up with the challenges in this critical period. Indeed, tech companies and developers also competed in improving their digital products and even developing new innovations. It is therefore important that these stages are foregrounded so that we could know where we are and where we aspire to move forward.

2.2 Connectivism: A Learning Theory for The Digital Age

The theory of connectivism stems from a decentralized concept that emphasizes the dissemination of knowledge and not limiting it to time and place. It asserts that the learner of today has to develop an ability to search effectively in a vast thicket networks to widen his/her perspective and contribute efficiently to the development and refinement of knowledge, using the right and relevant digital learning skills (Siemens 2005). These themes are assumed to be the areas of focus in three ISTE Standards, namely Global Collaborator, Creative Communicator and Knowledge Constructor.

2.2.1 Background

Connectivism embraces the assumption that knowledge exists in the world around us and doesn't abstractly exist in the human brain (Dreamson, 2020). According to this explanation, knowledge resides in systems that are accessible to individuals who take part in particular activities. Connectivism is sometimes referred to as the 'digital age learning theory' because of the way it is used to explain the impact of technology on people and the way they learn and communicate with each other (Kergel, 2020). As such, connectivism attempts to transcend the classical learning theories, i.e., behaviorism, cognitivism and constructivism; more precisely to be seen as the 'standard progression' of these theories (Jones, 2016). Although connectivism could be viewed as similar to the social constructivist theory in that they both argue for providing communicative and interactive learning environments for students (Ng, 2016), it places its emphasis on digital learning through networks, diversity of the network, the dynamically changing network and the variation of resources (Asher Rospigliosi, Greener and University of Brighton, 2014).

Connectivism came to light by Siemens (2004) who proposes that it illustrates the way learning happens in electronic environments and how new group dynamics impact this environment through the use of technology. It is a relatively new theoretical framework (Jung, 2019) that seeks to understand the contemporary learning processes and to place them in an effective social context (Dron and Anderson, 2014). Siemens indicated that connectivism helps to integrate between the pedagogical implications of the theories of Chaos, Networks, Complexity and Self Organisation (Hadjileontiadou and Al, 2015). The emergence of connectivism resulted as an attempt to find the link which the three learning theories could be missing due to the advancements in the digital age (Černá, Svobodová and Haviger, 2016). Behaviorism emphasizes learning through the stimulus-response mechanism, cognitivism focuses on the knowledge input, process and output and constructivism views learning as active construction of knowledge (Johnson, Tipps and Kennedy, 2018). Contrastingly, connectivism in this sense tends to view learning as a connection-forming activity of the knowledge that is distributed in the network (Andrej Flogie and Aberšek, 2019). What constitutes a main distinguishing characteristic of connectivism is its advocacy for creating a learning environment which is not 'contrived' or artificial and is designed for specific group of learners through a particular learning management system (Siemens, 2004). The latter theories recognize the importance of a pre-planned 'input' and an acceptable 'outcome', while connectivism recognizes the direct and dynamic interaction with the existing knowledge space to build awareness and connection, navigate knowledge, identify patterns, contribute and become involved.

2.2.2   Principles of Connectivism

Siemens (2004) denoted eight principles of the connectivism theory. These principles outline the main aspects of the theory from which we can conclude its implications in learning nowadays:

1. Knowledge and learning lie in the diversity of views
2. Learning is a process that connects 'nodes' and sources of data
3. Learning can exist in devices and non-human tools.
4. The ability to gain more knowledge is more important that what is already known.
5. Maintaining connections between different fields is vital to facilitate continuous learning process.
6. The ability to identify the connections between fields, concepts and thoughts is a core set of skills.

7. Detailed awareness of events is the main target for learning activities following connectivism.

8. Making a decision is a learning process by itself. What is considered right today could be wrong tomorrow due to the changes in the information used to make decisions.

2.2.3 Pedagogical Application of Connectivism

The application of connectivism is seen in various aspects in our life, not only within education in schools. Connectivism seeks to contextualize the processes of learning in our daily life into the formal style of learning in our educational institutions (Anderson, 2008). Its interconnected and networked system mirrors the experiences we make in our life (IRMA, 2018). This goes beyond the use of electronic devices to gain or produce knowledge. In addition to using electronic devices to create nodes of learning, students make use of various spaces wherever learning takes place (Ng, 2011). Therefore, the use of blogs, RSS, social media websites, YouTube, Flickr, Wiki, etc., to develop 'nodes' and make sense of the already existing knowledge is widely exploited in the pedagogical application of connectivism (Nussbaum-Beach, 2012). Hence, this ecology comprises every possible element needed for network creation. This includes values, beliefs, perspectives, learning dimensions, learning concepts, in addition to language, media and technology as the means of communication (Ulf-Daniel Ehlers and Springer-Verlag Gmbh, 2016). In this environment, learning develops through formal and informal ways. The learner in this sphere engages with digital tools independently and in collaboration with the community while seeking the support required through mentoring and apprenticing to produce the intended change and transformation (Huang et al., 2016).

2.2.4 Nodes of Knowledge

Nodes constitutes a primary concept in the formation of connectivism (Myburgh and Anna Maria Tammaro, 2011). They represent the meeting points of knowledge connections (Dreamson, 2018). The flowing of knowledge and information relies significantly on the strength of these connections (Claire Howell Major, 2015). Learning in this effect evolves through the organisation of nodes and connections to generate new meaning (Lambropoulos and Margarida Romero, 2010).

2.2.5 Related Studies

There have been several studies that explored the theory of connectivism and its impact on students' learning. Alzain (2019) concluded that Google and Edmodo had positive impact on facilitating a collaborative learning based on connectivism theory. Sitti and Sompong (2013) developed a model based on connectivism to promote problem thinking skills in higher education. Their results indicated that web-based learning supported by the principles of connectivism learning theory raised students' levels of problem solving. In her study, Lajmiri (2016) examined students' academic achievement via the use of communication tools based on connectivism. She found that in chemistry lessons there were positive outcomes in elevating academic achievement. Her study also revealed no significant differences between the two groups of study in relation to student engagement. Mohamed, et al. (2017) evaluated the use of a web 2.0 technology tool in a quantitative exploration to measure its impact on student achievement. Their study revealed a correlation between web 2.0 technology and connectivism towards the achievement of students using a structural model.

2.2.6 A Critical Look at Connectivism

As it is the case with any theory attempting to interpret how learning occurs, advocates of classical learning theories criticized connectivism. They are skeptical about it being a theoretical framework or an educational model or approach rather than a theory of learning (Jung, 2019). Others believe that connectivism doesn't amount to a theory of learning, but it is a pedagogical view. Theories include the description, interpretation, control and prediction of a particular phenomenon which are based on testing hypotheses (Steven Laurence Danver, 2017). They argue that technology, which is a focal core of connectivism is merely a supplemental factor, while classical learning theories are sufficient to explain learning. In other words, connectivism exhibits the concepts of constructivism with the addition of technology. Therefore, connectivism cannot explain learning or instruction but it can be a theory for curriculum (Ulf-Daniel Ehlers and Springer-Verlag Gmbh, 2016).

However, and in effect, whether connectivism introduces a learning theory or it is merely a supplemental pedagogical contribution, its proposition still fills the gap of the need for an advanced vision of learning and how it is approached, particularly with the rapid growth, yet explosion, of

information and technology in our recent history. It is necessary to view learning in light of this transformation, even if traditional learning theories had previously explained and elaborated on it.

2.3 Design Thinking

Design Thinking gives another dimension for using technology in schools which is more pragmatic than the preceding two theories. It emphasizes learning in schools through projects, problem solving and testing solutions (Goldman and Zaza, 2017). It also orients the thinking process to take a different perspective that is more useful and effective to reach solutions when utilizing existing knowledge and technology. This is exemplified in what the fourth and fifth ISTE Standards for Students entail, namely Innovative Designer and Computational Thinker.

2.3.1   What is Design Thinking?

Design thinking refers to the processes and methods used to investigate ambiguous problems, gain relevant information and analyze knowledge within a framework of planning and designing. The United Nations Development Programme (UNDP) defines design thinking as a methodology which is based on finding solutions and human-centered innovation (UNDP, 2017). It is a process that comprises five steps: 1) Observation, 2) Ideation, 3) Prototyping, 4) Testing and 5) Implementation (Walter Leal Filho et al., 2018). Design thinking puts individuals whom we design for in the heart of the design process and invites them to find concrete solutions (Hwee, 2016). It is an innovative approach that is human-centered and is informed by a variety of designer tools to integrate people's needs, the potentials of technology and the prerequisites of business success (Ling, 2016). By practicing design thinking, we seek to understand the user and rephrase problems in an attempt to identify strategies and alternative solutions that may not appear simultaneously via initial understanding of problems and situations.

2.3.2   A Brief History

The concept of designing emerged for the first time in 1980s with the arising of the human-centered concepts (Dreon and Polly, 2017). However, as a rigorous process and a way of thinking, it can be traced to the book of Herbert A. Simon: The Science of Artificial in 1969 (William Sims Bainbridge, 2012). Since then, design thinking started to be used in architectural design and for commercial endeavors. (Schön, 1983) and continued to expand down to what is known now as

'design thinking' by Peter Rowe in his book, Design Thinking (Rowe, 1987). More comprehensive views and perspectives of design thinking have been introduced by various writers to this day, in addition to the increasing academic interest and activities to comprehend design thinking and design perception.

2.3.3   Design Thinking in Education

If optimally used, design thinking is believed to enrich the experience of learners, educators and educational institutions (Taras, 2015) and re-frame the art of teaching, learning and assessment (Oakley, 2019). Education faces a lot of challenges where design thinking can be seen as an opportunity to address these challenges and provide innovative solutions to schools and other learning communities (Goldman and Zaza Kabayadondo, 2017). Design thinking can contribute effectively to the success of the educational system in different ways. These ways include the creation of a captivating learning environment where communication can greatly be enhanced between students and coleagues (Panayiotis Zaphiris, 2015). The identification of problems is also a pivotal area where design thinking can provide valuable input and a thinking approach that help schools define challenges and confront them in differently (Wee and Subramaniam, 2006). Schools can then develop solutions that can be tested and eventually inform the setting of new curriculum plans (Wong, Salleh Hairon and Pak Tee Ng, 2019).

In an educational settings, Carroll et al. (2010) defines design thinking as the cognitive process used to construct ideas in an integrated, meaningful and useful way out of simple meaningless parts. According to Caroll, this process enables students to develop creative designed solutions to real-world problems. The need arose to embed design thinking in education owing to its role in preparing students for the working life (Hasso Plattner, Christoph Meinel and Leifer, 2014). It also satisfies the need for societies to skillfully rehabilitate their members to be able to think creatively during the performance of work and duties. Moreover, thinking is a vital necessity and skillful thinking can only flourish through education. The invention and generation of ideas is not an inclusive preserve of experts and intelligent people. It's an art and that can be taught until it becomes a default practice. The World Innovation Summit for Education in 2017 contextualised the main stages of design thinking into the field of education as follows (Diefenthaler et al., 2017):

1. **Discovery**: "finding inspiration through empathy"

The creation of new solutions for students starts with understanding their needs deeply. The discovery process is based on monitoring users and listening to them to pave the way for generating and inspiring new ideas.

2. **Interpretation**: "uncovering patterns and insights"

This step moves the stories gained in the discovery stage to a meaningful human centered visualization. An observation, field trip or even a short conversation can be a source of inspiration. In the discovery stage, there are attempts to find the real significance and transforming it to applicable design opportunities. Intensive generation of ideas and refining them continues to take place until a wonderful perspective and direction emerges.

3. **Ideation**: "generating ideas"

This refers to the organised brainstorming activity where unrestricted thinking is extensively encouraged. This could be the spark for the generation of inspiring ideas. Careful preparation is then undertaken by following a clear set of rules that result in miscellaneous new ideas.

4. **Experimentation**: "fast iterative learning by doing"

Experimentation seeks to breathe life into the brighter ideas. Through prototyping, ideas become tangible and can be shared with others. These prototypes could be immature or hastily developed, but with immediate feedback, ideas will be consolidated and enhanced.

5. **Evolution**: "refining a concept over time"

Evolution represents the implementation stage in the process of designing where next steps are planned and communicating the ideas to individuals who can help realize them as well as documenting the entire process. Through constructive feedback, ideas keep changing and evolving over time and any progress is praised and celebrated, no matter how slight and modest it was.

2.3.4 Design Thinking as a Teaching Strategy

Design thinking can be used as a teaching strategy (Liu and Goh, 2019) or it can be incorporated with other strategies such as project-based learning, learning through inquiry, problem-based learning to help students promote the skills of these approaches to learning (M Elena Gómez-Parra and Huertas-Abril, 2020). By practicing the design thinking processes, students can develop their

questioning skills (Melles, 2020), self-organisation and responsibility for learning (Carter et al., 2019). Teachers can also take advantage of design thinking to overcome the challenges of traditional learning environments by recycling the already existing materials (Amaresh Chakrabarti, 2017) to maximize the use of these material for the benefit of the development of their students' thinking skills.

2.3.5 Success Stories in Design Thinking

A) Innova Schools

Design thinking has proven to be a successful solution in addressing the lack of resources and capabilities. Some countries managed to face these challenges, particularly when it is difficult to find skilled teachers or qualifying large numbers of teachers and gaining access to land at cheaper prices as what happened in the country of Peru. The entrepreneur Carlos Rodrigues and the educator Jorge Chessman created a school model called 'Innova Schools' which is based on design thinking and under the expertise of the Innovation Design Engineering Organization (IDEO). An IDEO specialized team designed a curriculum strategy that was appropriate for the status of teachers and was focused on people. School day was divided into two parts. The first part had classrooms of 30 students each who work collaboratively on projects under teachers' directions, while in the second part they learned independently in a self-directed way and at their own pace using digital tools and environments such as Khan Academy. The reason for doing this was to save the time of teachers in a way that enables one teacher to take care of tow classrooms at the same time, while another teacher of another classroom dedicates his/her time to self-develop him/herself or for planning lessons. Through the use of digital technology, taking advantage of the available learning platforms and effective rescheduling to prepare and train teachers, Innova schools managed to optimise the use of limited resources and keep costs down. (Diefenthaler et al., 2017).

B) Design Tech School

Design Tech school is a public school in California which set a guide to manage change in the school where all staff work according to this guide to develop solutions to the issues which they faced school-wide. During school breaks, the staff worked together to achieve

what they called 'design sprints' which gave them the opportunity to respond to students' needs. These challenges included staff orientations, designing students' presentations and creating models that cater for individualized learning. (Diefenthaler et al., 2017).

2.3.6 Design Thinking in Research

Not only design thinking transforms organizations and inspires innovation (Hew and Cheung, 2014), but it also has its impact on teaching and learning in the classroom (Myint and Areepattamannil, 2019). Teachers can undertake the role of the designer to make learning resembles a design project through which students work creatively (Kelly, 2016). For instance, through discovery, teachers can explore the needs of their students to identify certain concepts related to an area of inquiry or an industry-specific terminology. They then create the motivation to plan for tasks and projects so that student could work collaboratively to achieve pre-determined goals. They encourage students to pinpoint the issues and problems relating to an area of inquiry and perform brainstorming activities using digital tools and platforms to generate ideas and design prototypes for solutions (Robinson and Knight, 2019). Students then continue to refine and test these models until they figure our rigorous solutions to the issues or problems.

In his study, Roy (2017) discussed task-based language learning through design education by analyzing objects using computer-aided software and physical LEGO in interactive activities. The study focused on analyzing the performance of students while working with LEGO designs and CAD software. His study recommended embedding design pedagogy in English as a Foreign Language (EFL) curriculum design as he discovered that students not only learned about the basics of design, but also learned how to author complex documents about designing, He also concluded that students were able to deal with task-based learning projects at a reasonable amount of confidence and efficiency. Sakka (2020) conducted a study to investigate the impact of a suggested strategy based on design thinking to improve writing performance of English language learners. She concluded that the proposed strategy had significant effect on the writing performance and the development of their sustainability awareness. Nguyen-Xuan (2018) implemented a design thinking model aiming at developing speaking and writing skills, presentation skills and research skills. The researcher found that learners acquired various skills and increased motivation in language learning. Alrehaili and Alhawsawi (2020) examined creative ways in teaching writing through carrying out

a human-centered model of design thinking, in response to the writing challenges in teaching English as a foreign language. She concluded that teaching writing through design thinking improved learners' writing skills in relation to cohesion, organisation, structure, mechanism and vocabulary, in addition to their active participation and overall satisfaction.

2.4 Literature and the Present Study

By reviewing the literature and related studies, it appears that digital learning can be explained as a manifestation of the development of certain theories and theoretical frameworks over the last few decades, such as the diffusion of innovation, connectivism and design thinking. While this study is geared towards exploring digital learning, this exploration is carried out in an unprecedented educational setting. Related studies, reviewed in this chapter, may reflect a strong influence of the adoption of specific theories and frameworks, however, the important nuance of this study lies in the critical time of its implementation. Since the beginning of the pandemic, and until the moment of finalizing this study, several writings, articles, studies and research papers were being published to contribute to the overall picture of this critical educational milestone.

The intensive use of technology in education during this time may put students' digital learning at an advanced point on a continuum of achievement, or possibly regression, compared to how it was before the pandemic. In regions where good technological infrastructure is found, such as the UAE, the possible gains from using technology in education could be immense during the pandemic, despite other challenges caused by the restricted social and human interaction. Therefore, this study is expected to contribute to the existing literature by exploring how students' digital learning skills were shaped during the pandemic, which may inform the development of suitable assessment strategy of digital learning that takes into account the ISTE Standards and considers existing advantages and drawbacks.

CHAPTER 3: METHODOLOGY

The approach to address the area under study followed a mixed-method exploratory direction to examine the perceptions of Arabic language teachers and their Heads of Departments (HODs) towards their students' use and experience of digital learning during the COVID-19 pandemic. Quantitative and qualitative data was collected form Arabic language teachers while qualitative data was collected from Arabic language leaders. The overarching purpose was to gain deeper insight into how they perceived their students' use of digital learning skills using the available technologies to bridge the gap induced by resorting to distance and/or blended learning solutions in schools.

3.1 Methodological Approach

As noted in the preceding paragraph, this study attempted to understand the perceptions of Arabic language teachers and leaders on their students use of digital learning skills in a critical period of time. Since the teachers were the first and most frequent point of communication with students during school closure, qualitative and quantitative data was gathered from them. This is to inform how they made sense of their students' learning on digital devices and platforms. This was carried out through a questionnaire that prompted teachers' responses on a Likert rating scale to which seven open-ended questions were attached for further justification of their ratings on the scale.

Subsequently, data were obtained from Arabic language HODs and was entirely qualitative through semi-structured interviews. Quantitative data from the Arabic leaders were not planned in this study due to their sample size in this study (three leaders in three schools). Furthermore, Arabic language leaders were not in close contact with students as compared to the teachers during this time and obtaining numerical data from school leaders may question the reliability of this data. Interviews with Arabic language leaders were expected to give a broader view of their perceptions in light of the overall situation and linked to the findings from the study questionnaire. Document analysis was an integral part of data collection. The UAE's Distance Learning Evaluation Tool, introduced during school closure and lock-down, was analysed to assess the status of digital learning skills as an aspect of school inspection undertaken during this period of time.

3.2 Description of Data Collection Tools

3.2.1 Questionnaire

The questionnaire given to Arabic language teachers included seven standards which represented the standards of the International Society for Technology in Education (ISTE) for Student. These standards described the digital learning skills expected to be demonstrated by students of the digital age: 1) Empowered Learner 2) Digital Citizen 3) Knowledge Constructor 4) Innovative Designer 5) Computational Thinker 6) Creative Communicator 7) Global collaborator. Each standard was described in one sentence which had underneath it four performance indicators stating how this standard could be achieved. After each set of indicators pertaining to one standard, there was a prompting question for participants to answer: '*Describe evidence which demonstrates that your students have, totally or partially, met this standard*' (See Appendix 7.2).

3.2.2 Interviews

Semi-structured Interviews were conducted with Arabic language HODs who worked with the participating teachers in the same school (See Appendix 7.3). Prior to interviews, the researcher contacted these Arabic leaders to agree on the times and dates of the interviews. During the interview, the researcher requested consent to record the interview and to use its data for the purpose of this research. Interviews were recorded via Zoom application and were aimed at obtaining Arabic leaders' responses on open questions related to the researched area of study and linked with the responses given by their subordinate teachers on the questionnaire. Each Interview lasted for approximately 30 minutes with the following structure: 1) one opening question 2) four main questions and 3) one closing question. Participants were expected to speak freely about their experience whilst the researcher intermittently intervened with prompting ideas to guide the conversation towards the study question (See Appendix 7.3).

3.2.3 Document Analysis

The UAE's Distance Learning Evaluation Tool was thematically analysed in relation to the study objective. This tool is the official assessment document used to evaluate and rate schools in the UAE during the COVID-19 time. The document was developed to assess distance learning activities and services provided by schools and placed emphasis on supporting schools to identify areas of improvement. The overarching goal of this tool was to help schools achieve more sustainable

distance learning approaches that are based on the most up-to-date technologies and methodologies (See Appendix 7.4).

3.3 Analysis and Discussion of Results

Quantitative data obtained from this study questionnaire was statistically analyzed and discussed in the results section of this dissertation. Numerical data representations were displayed and interpreted in conjunction with the thematically tabulated qualitative responses to the seven open-ended questions in the questionnaire. Thorough reading of the qualitative data was undertaken in the first place for familiarization with the content. Relevant responses were then labeled to identify concepts, variations, actions, disparities, differences, similarities, patterns etc. Categories were created to consider the most relevant and important themes and rule out the irrelevant or less important ones. Themes were categorized in terms of their relevancy to the research question.

Data obtained from the interviews with the Arabic leaders were primarily aimed at generating confirmatory and/or complementary results from the Arabic leaders about areas identified from the administration of the completed questionnaire by the Arabic teachers. Further insights on how the Arabic leaders managed the facilitation of digital learning experience in their schools. This data was transcribed, coded then discussed. Qualitative document analysis was carried out on the UAE's Distance Learning Evaluation Tool. The purpose of this analysis was to gain an informed insight into the extent to which this tool, as it now stands, assessed students' digital learning skills. Based on the findings of the document analysis, questionnaire and interviews, realistic digital learning assessment criteria were proposed.

3.4 Study Sample and Selection Rationale

The sampling technique in this study was a purposeful one. Three high-performing private schools in Dubai, according the KHDA Inspection Framework Report, were identified. Two of these schools followed a British Curriculum and the third school followed an American curriculum. The rationale behind the selection of the three schools was that, to the knowledge of the researcher and his close professional connection with the selected schools, they made impressive strides in teaching and learning using digital tools during the COVID-19 pandemic. Therefore, this sample was considered as being rich in information with regards to the study questions and its overarching

objective. Furthermore, examining these schools was believed to provide useful insights into how they survived the tough times and how this was reflected in their students' learning. Findings from these high-performing schools may set an example for other schools to follow and for education decision makers to be mindful of a reality-based benchmark assessment of digital learning in the country.

The study targeted Arabic language teachers and leaders in these schools to provide information on how they perceived their students' digital learning on continuum of international standards. Arabic language teachers in the participating schools were requested to fill out a questionnaire, while interviews were conducted with Arabic leaders in these schools for their responses to bring forth more comprehensive understanding of the data generated from the questionnaire. Educational stages taught by the teachers ranged between secondary to post-secondary stages (British curriculum) and middle to high school (American curriculum). The purpose of this selection was the assumption of the researcher that it would have been highly reliable to seek data from the teachers who teach relatively older students due to their readiness to use digital tools effectively by virtue of their older ages, and particularly when faced with an unprecedented situation with no prior planning and preparation.

3.5 Validity and Reliability

To determine the validity of the seven standards of the questionnaire, internal consistency using Pearson Correlation Square was measured. The below table indicates this procedure:

Table 1: Pearson correlation coefficients between the questionnaire items and total value

Questionnaire standard	Number of indicators	Pearson Coefficient	Pearson Coefficient Square
1	4	0.927**	0.962
2	4	0.940**	0.969
3	4	0.969**	0.984
4	4	0.917**	0.957
5	4	0.864**	0.929
6	4	0.948**	0.973
7	4	0.932**	0.965

(**) Significant at (0.01)

Table 1 indicates statistically significant correlation between the overall value of each standard in the questionnaire and the overall value of the entire standards in the questionnaire. All values were

significant at (0.01). It is also shown in the table that the root square of the values of correlation coefficients ranged between (0.929 – 0.984) which confirms high internal consistency of the questionnaire and that the questionnaire had a higher degree of validity. With regards to reliability, it was tested using Cronbach's Alpha as displayed in the below table:

Table 2: Reliability coefficient of the questionnaire

Number of indicators	Cronbach's Alpha Coefficient
28	0.982

As shown in table 2, Cronbach's Alpha Coefficient value for the reliability of the tool scored 0.982 which indicates a high value and confirms that the tool was highly reliable.

Semi-structured interviews were utilized in this study as a subsequent data collection step after the questionnaire. They were meant to explore complex knowledge, beliefs and experiences, in addition to providing more depth of information (Lodico, Spaulding and Voegtle, 2010). Interview questions in this study were developed at an earlier stage and, later on, they were revisited following the discussion of the questionnaire results. The revised questions were more focused at gaining further and deeper insights from the leaders in relation to findings obtained from their subordinate teachers in within their leadership capacity. The objective here was to avoid risking the validity and reliability of the tool as suggested by Brundrett and Rhodes (2014) who stated that the reliability and validity of a qualitative tool could be enhanced by careful piloting and crafting highly structured questions to enhance reliability.

3.6 Ethical Considerations

School principals and deputy principals in the participating schools were approached via their official school emails to seek consent to include their schools, Arabic teachers and Arabic HODs as participants in the study. They officially expressed their consent in their reply to the researcher's emails requesting approval. The emails clearly stated that no reference to the schools would be mentioned in the study unless otherwise requested explicitly in writing by the school (See Appendix 7.5). The written introduction in the questionnaire explicitly stated that participant teachers' names and personal details will not be disclosed. The names and email addresses were made optional on the questionnaire to limit any power relationship between the teachers and the researcher. The use

of the ISTE standards as the core of the questionnaire elements is copy-right free and this was explicitly stated on the ISTE website that researchers could use the standards for research purposes. Informed consent during the interviews was sought from Arabic language leaders to record their responses. It was clearly mentioned in the interview protocol that their names and personal details would not be disclosed, by any means, in the study unless the researcher was in receipt of prior explicit consent from them as well as their school principals.

CHAPTER 4: RESULTS AND DISCUSSION

The study aimed to explore the perceptions of Arabic language teachers on students' implementation of digital learning against the standards of International Society for Technology in Education (ISTE) for students through the use of a quantitative/qualitative questionnaire. The study also targets to identify Arabic language leaders' perception on the implementation of digital learning in their schools through the use of open-ended interviews. Findings from the analysis of the UAE Distance Learning Evaluation Tool will also be presented and discussed to understand the reality of digital learning as an aspect of school assessment in the document.

4.1 Questionnaire: Data Analysis and Discussion

4.1.1 Sample Characteristics

The number of respondents to the questionnaire reached a total of 31 participants from one American and two British schools. The following tables show the classification of the study sample as per their demographic data:

Table 3: Sample distribution by gender

Gender	Number	Percentage
Male	18	58.1 %
Female	13	41.9 %
Total	**31**	**100 %**

Table 4: Sample distribution by School Curriculum

School Curriculum	Number	Percentage
American	9	29 %
British	22	71 %
Total	**31**	**100 %**

Table 5: Sample distribution by Stage

Educational Stage	Number	Percentage
American (High School)	3	9.7 %
American (Middle school)	6	19.4 %
British (Post-16)	3	9.7 %
British (Secondary)	19	61.3 %
Total	**31**	**100 %**

Table 6: Sample distribution by years teaching experience

Years of Experience	Number	Percentage
7-10 Years	9	29.0 %
11 and above	9	29.0 %
3-6 Years	8	25.8 %
1-2 Years	5	16.1 %
Total	**31**	**100 %**

Table 7: Sample distribution by Subject Taught

Subject Taught	Number	Percentage
Arabic as a first language	7	22.6 %
Arabic as an additional language	24	77.4 %
Total	**31**	**100 %**

As shown in tables 3-7, Arabic teacher who completed the questionnaire varied in their demographic background. The percentage of male teachers was relatively higher than female teachers (58.1% and 41.9% respectively). British schools teachers constituted the majority of participants (71%) compared with (29%) in the American school. Also, the majority of the participating teachers (83.9%) had more than three years of experience in teaching. Teachers of Arabic as an additional language accounted for the majority of participants by (77.4 %), whilst the rest taught Arabic as a first language (22.6 %).

4.1.2 Analysis and Discussion of Findings

Numerical data pertaining to the seven ISTE Standards for Students, as well as each individual standard, will be presented and followed by a presentation of findings to indicate and discuss notable observations that are most relevant to the first study question: *what are the perceptions of Arabic language teachers on students' implementation of digital learning against the International Society for Technology in Education (ISTE) Standards for Students?* Explanation of findings will consider the analysis of the qualitative data provided in teachers' responses to the seven open-ended question accompanying of the questionnaire standards.

4.1.2.1 Overall Quantitative Responses

Table 8: Overall participant teacher quantitative responses on the questionnaire

#	Standards		Never	Rarely	Occasionally	Moderately	Greatly	Relative Weight	Percentage	Standard Deviation	Rating
1	Empowered Learner	# of Responses	2	1	6	32	83	4.556	91.129	0.76359	1
		% of Responses	1.6%	0.8%	4.8%	25.8%	66.9%				
2	Digital Citizen	# of Responses	2	4	5	37	76	4.460	89.1935	0.85173	2
		% of Responses	1.6%	3.2%	4.0%	29.8%	61.3%				
3	Knowledge Constructor	# of Responses	2	2	7	52	61	4.355	87.097	0.79896	4
		% of Responses	1.6%	1.6%	5.6%	41.9%	49.2%				
4	Innovative Designer	# of Responses	2	3	11	57	51	4.226	84.516	0.83481	6
		% of Responses	1.6%	2.4%	8.9%	46.0%	41.1%				
5	Computational Thinker	# of Responses	2	6	18	55	43	4.056	81.129	0.91898	7
		% of Responses	1.6%	4.8%	14.5%	%44.4	34.7%				
6	Creative Communicator	# of Responses	2	2	7	48	65	4.387	87.742	0.81115	3
		% of Responses	1.6%	1.6%	5.6%	38.7%	52.4%				
7	Global Collaborator	# of Responses	2	3	12	48	59	4.282	85.645	0.86770	5
		% of Responses	1.6%	2.4%	9.7%	38.7%	47.6%				
		# of Responses	14	21	66	329	438	4.332	86.636	0.83528	

Total	% of Responses	1.6%	2.4%	8%	37.9%	50.5%				

Table 8 shows that the average relative weight value of the seven standards was (4.332) out of (5.0). This indicates the strength of participant responses on the overall seven standards. In the meantime, the relative weights ranged between (4.056) – (4.556) out of (5.0) while the standard deviation ranged between (0.76350) – (0.91898) which suggests the convergence of participants' responses on the questionnaire. The table also reveals that, from the perspective of (50.5%) of responses, students remarkably implemented digital learning skills. This can be attributed to the preparedness of the three participating schools for distance learning before the COVID-19 Pandemic and that the national rating of these school ranged from very good to outstanding which enabled students to undertake effective digital learning skills at notable level of international benchmark.

In a study conducted by Nguyen (2020), it was found that, in contrast to public schools, practical actions and concrete solutions were undertaken in international schools in preparation for school closure during COVID-19 pandemic with more room for students to acquire knowledge in school subjects. One other possible factor for these results is the fact that the participating teachers taught grades above the primary stage. Students above the primary stage may demonstrate highly effective digital competency because of their older age. Findings by Matijević, Topolovčan and Rajić (2017) revealed that both primary and elementary teachers shared positive attitudes towards digital learning integration, but elementary teachers were able to assess this integration more positively. This sounds to be an area for further research to understand the differences in technology implementation across age groups.

4.1.2.2 Overall Qualitative Responses

The above numerical data can be further understood considering the qualitative responses underneath each standard where participating teachers were prompted to answer this mandatory open ended-question after they rated their students' digital learning on a Likert scale: *Describe evidence which demonstrates that your students have, totally or partially, met this standard.*

By analyzing the responses on the seven open-ended questions, table 9 below describes the main highlights of teachers' responses resulting from tabulation of data:

Table 9: Overall participant teacher qualitative responses on the questionnaire

Digital tools	Developed Artifacts	High-leverage Activities
PowerPoint	Videos	Delivery of weekly news reports
Live Worksheets	Presentations	Website development
Edpuzzle	e-Portfolios	Participating in international competitions
Padlet	Posters	Conducting online debates
Kahoot	Reports	Communication with other schools
Quizzez	Search plans	Conducting online symposiums
OneNote	Mind maps	Communication with experts, locally and globally
Nearpod	3D Objects	Publishing work on external media channels
Google search	Websites	Interviewing government officials
YouTube	Blogs	Engaging their parents
Wikipedia	Linguistic games	Reading books on digital libraries
Coding software	Surveys	Share opinions and solutions for public issues in a wider context.
Google forms	Graphs	Contact officials to get permission for particular activities
Excel	Social media pages	Virtual Trips using Google Earth
Social Media Websites	Statistics	
Zoom	Research papers	
MS Teams		
Google earth		

Table 9 outlines the digital tools which students used, their produced artifacts and the high-leverage activities they engaged with during this time, making use of the available technological support provided by their schools and within their own capacities. Various other learning activities were also mentioned in their responses and will be highlighted later in this section. It also appears from the table that students used various digital learning tools to facilitate their learning. These tools ranged between common simple ones, such as google search engine and YouTube, to more complex ones, such as Edpuzzle and coding software. Students' learning outcomes, as reported by their teachers, showed a high degree of sophistication where they created online games, blogs, websites, 3D objects, etc. The activities also reported higher level thinking skills including engagement in online debates, contacting experts, communicating with others outside of the country to discuss social issues, etc. This reflects the teachers and schools' openness to the world around them and their view that learning in an interconnected world cannot only be limited by the school boundaries.

This is an educational necessity as descried by Huang et al. (2016) who indicated that learners, according to the connectivism theory, should engage with the wider community and seek support from their tutors to produce the intended change and transformation.

4.1.2.3 Disparity between Responses

Table 6 also displays standard 1 as receiving the strongest responses on the Likert scale. It came first in ranking on top of all other standards at a relative weight of 4.556 (91.129 %). This implies that the participating teachers believed that their students were empowered to use technology in an efficient way. In contrast, standard 5 received the lowest responses and came at the seventh rank at a relative weight of 4.056 (81.129%) indicating that teachers' perception of their students' digital skills as computational thinkers was not as developed as the rest of the standards, whilst their responses on this standard was still strong at a standard deviation value of (0.91898).

The differences between these two standards; Empowered Learner and Computational Thinker, can be understood in the context of the responses to the two open-ended questions pertaining to these two standards as shown in the below two tables, based on the thematic tabulation of qualitative responses:

Table 10: Participant teacher qualitative responses to Standard 1

Standard 1: Empowered Learner				
Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences				
Record and create videos via Edpuzzle etc.	Design multimedia presentations	Use live worksheets	Publish researched issues on relevant platforms	Design online digital posters on topics of study
Create online weekly news reports	Share written products on Padlet, Kahoot, Quizzez, OneNote, Nearpod			

Table 11: Participant teacher qualitative responses to Standard 5

Standard 5: Computational Thinker
Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions

Use coding programmes	Use google forms statistics to generate numerical data on specific problems	Use Excel to create graphs	Collect data on secondary problems first before working on the main problem

As displayed in table 10, teachers provided the strongest responses to standard 1, Empowered Learner, because they believed that their students took advantage of the available technologies to produce high quality digital outcomes respective to their learning goals, such as recording and creating videos, designing digital posters, using platforms to present their written products, etc. In the raw responses prior to data tabulation, teachers elaborated on the quality of these products and described how engaged their students were to achieve their learning objectives. These findings can be attributed to the digital facilities which schools and teachers made available for their students to unlock their digital potentials. Using effective electronic devices allows students to create nodes (Ng, 2011) and build connection between fields to produce meaningful knowledge (Siemens, 2004). This accords with the findings of Lin (2017) who concluded that digital tools had positive effect on students' motivation and promoted learning outcomes and produced remarkable gains. Table 11 indicates teachers' responses to the open-ended question of standard 5, Computational Thinker. Although teachers mentioned that their students dealt with complex data such as software coding, processing data on excel and google forms statistics, their responses did not clarify how these were used in the context of problem solving and developing and testing solutions. One teacher was quoted in response to this questions as saying: "*we are still in need of more work to achieve this standard*". Besides, the frequency of the responses to standard 5 question by all teachers was quite limited. This indicates that there were less answers to share about the fulfillment of standard 5 compared to the recorded responses pertaining to standard 1.

This can be justified by the urgency of the situation which schools were experiencing. Dealing with computational data to develop and test solutions can be a challenging task that requires a lot of training for students as well as teachers themselves. Belanger, Christenson and Lopac (2018) found that one of the factors influencing effective computational thinking in schools is students' reading comprehension skills. The sample in this this study was Arabic teachers and the majority of them taught Arabic as a foreign language. This could be one of the reason why computational thinking was given the lowest responses due to the limited opportunities Arabic teachers might see in their subject to incorporate computational thinking in classrooms. Moreover, working from a distance or

through challenging blended learning arrangements deprived students from being in close contact with their teachers to receive corrective and constructive feedback on computing, automatizing and solution testing in an algorithmic manner, especially while enacting very strict social distancing procedure to limit the surge of the plague.

4.1.2.4 Rating of Responses

On reflecting on the rating of the seven standards, the table below displays the ranking of these standards according the strength of responses provided by the participating teachers:

Table 12: rating of quantitative responses as per teachers' responses on the questionnaire

Standard description	Ranking as per teacher responses	ISTE ranking
Empowered Learner: Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences	1	1
Digital Citizen: Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical	2	2
Creative Communicator: Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals	3	6
Knowledge Constructor: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.	4	3
Global Collaborator: Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.	5	7
Innovative Designer: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.	6	4
Computational Thinker: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.	7	5

As can be inferred from table 11, there is a notable progression of the standards that reflected the complexity of competencies required for students to achieve each standard. Transition to distance/blended learning during the COVID-19 pandemic caused a high degree of instability in teaching and learning with many trials and errors. This factor made schools pay attention to making use of their already existing digital infrastructure to firstly adjust themselves to the new

environment, and secondly to combat the challenges they faced. Working in such atmosphere, shifted and rearranged schools' priorities to consider the status quo prior to thinking about going deeper into hitting higher expectations.

This aligns with the study conducted by Moss et al. (2020) who investigated the priorities of schooling during COVID-19. They revealed that setting parental conversation with families about students' wellbeing, focusing on enjoyable activities and ensuring that students have online opportunities to learn were among the main concerns of schools during the lock-down in England. What made the difference in this unstable scene was how prepared schools were before getting into the new challenging experience. Owing to their readiness, the three participating schools used to employ technology at a larger scale in their daily school and classroom activities before the pandemic. However, when it was time for distance learning, they extended their technology application but without the benefit of face-to-face interactions which is essential for thoughtful practices, in-depth learning experiences and immediate live support for students as well as teachers.

4.1.2.5 Qualitative Responses to the Seven Standards

Notably, the progression was not only evident in the quantitative responses to the questionnaire, but also in the text responses to the seven open-ended questions on the same questionnaire form. Below is the complete qualitative analysis of teachers' responses on the seven standards; in their original ranking as introduced by the ISTE.

Table 13: Detailed qualitative responses of participant teachers on the seven standards

Standard 1: Empowered Learner				
Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences				
Record and create videos via Edpuzzle, etc.	Design multimedia presentations	Use live worksheets	Publish researched issues on relevant platforms	Design online digital posters
Create online weekly news reports	Share written products on Padlet, Kahoot, Quizzez, OneNote, Nearpod			
Standard 2: Digital Citizen				
Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical				

Become familiar with platforms before engaging with them	Use Real names and open Cameras	Acknowledging others' work	Follow criteria to search on Google	Protocol for online classroom interaction
Lesson recording for self-monitoring	Obtain data from reputable media agencies	Report suspicious online acts	Seek permission from respective authorities to develop websites	
Standard 3: Knowledge Constructor Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.				
Determine methodological scope before searching for information online	Create portfolios, multimedia, presentations, to present knowledge in a cohesive manner	Analyse information from Google, YouTube and Wikipedia	Search to fill gaps in information	Access digital libraries to read books related to their study
Create online linguistic games	Distribute roles of leadership, researching, analyzing, monitoring and participating.	Gather similar information from different perspectives		
Standard 4: Innovative Designer Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.				
Create 3D Objects relevant to their topics of study	Design online surveys to collect information	Follow criteria during designing	Draw on available statistics before designing a product	Create mind maps to clarify complexity in grammar and rhetoric
Design products to explain a problem and offer solutions	Developing websites and blogs to share information on social issues			
Standard 5: Computational Thinker Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.				
Use coding programmes	Use google forms statistics to generate numerical data on specific problem	Use Excel to create graphs	Collect data for broken-down problems before working on a major problem	
Standard 6 **Creative Communicator**				

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals				
Create social media pages in Arabic and share ideas and learning outcomes	Communicate ideas through posting videos with parents about their interests	Clarify complex ideas through PowerPoint presentations	Engage in online debates with colleagues	Exchanging messages through learning platforms with colleagues
Conduct interviews with students from other schools to exchange ideas using Zoom				
Standard 7: Global Collaborator Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.				
Run online symposiums using school platform	Interview with people from other nationalities in Arabic	Publish their work on social and global issues on school magazine	Participate in International Arabic speaking competitions	Seek support from each other when facing difficulties
Collaborate in national holidays to share cultures	Distribute roles of leadership, researching, analyzing, monitoring and participating.	Communicate with online trainers, ask questions and publish material externally to raise awareness		

As previously illustrated, the level of complexity involved in each standard determined the strengths of teachers' responses to the open-ended questions. Analysis of what each standard requires to be achieved, according to teachers' qualitative responses, gives an insight and justification for the logical quantitative rating of standards made by the teachers.

4.1.2.6 Progression of Qualitative Responses to the Seven Standards

4.1.2.6.1   The Three Top-Rated Standards

Standard 1, Empowered Learner, came first in ranking on Likert scale while the two standards, Digital Citizen and Creative Communicator, came second and third respectively. These three standards are aimed at learners able to use their digital skills to achieve their goals, undertake their responsibilities on a virtual world and use technology to communicate their messages effectively. Qualitative responses to these three top-rated standards showed skillful practices by students from

the perspective of their teachers. They used a wide range of available technologies, abided by school policies to this effect and engaged in internal and external social and extra-curricular activities using their digital communication skills which are usually exemplified by a lot of learners in this digital decade.

Stošić and Stosic (2013) investigated the diffusion of innovation in modern schools and their results indicated that teachers used innovations in their work smoothly and easily, dealt with innovation efficiently with regards to practicalities and showed positive views of innovations in their schools. The compelling fact that the participating schools, teachers and students had no other choice but to accept the use of use of technology to overcome barriers caused by the lock-down, the diffusion of innovation stages to adopt technological tools seemed to have gone quicker than normal. With strong technological infrastructure in these high-performing schools, the process became smoother which enabled students to achieve higher on these three standards.

As such, the zone of proximal development was quite narrow and gave students much comfort to show off their skills and bridge only little gaps to demonstrate competency on these standards. This conclusion is supported by the findings of Baker et al. (2020) that students who were engaged with tasks which they master their skills perform better than those engaged with ready-to-learn and unready-to-learn tasks. It can also be somewhat argued that skills embedded in these three standards have something to do what the behaviorist theory requires in terms of its emphasis on the automatic mastery of certain core skills before getting ready to engage in a thoughtful mental process using these skills.

4.1.2.6.2   The Fourth-Rated Standard

The Knowledge Constructor standard hung in the middle rank and was rated fourth in terms of the strength of response by the participating teachers. This fourth rating suggests the beginning of a new phase of higher expectations in the responses. In other words, it represented the focal point or key conduit between basic elements of digital knowledge and skills (as embedded in the first three top-rated standards) and the culmination and sophistication of these skills (as embedded in the three low-rated standards). Constructing knowledge, as a fourth-rated standard, requires the ability to make use of a wide range of recourses to present knowledge in a consistent and cohesive manner

through digital artifacts and outcomes while ensuring an engagement in meaningful learning experiences to produce this knowledge. This was recorded to an acceptable degree in student responses with a need to dive more in depth for further sophistication and knowledge formation.

Students engagement with digital learning in an interconnected network gives students the opportunity to go through a number of stages, as listed by Kongrugsa et. al (2016) who investigated the designing of knowledge based on connectivism to develop skills of critical thinking. These stages were 1) determining the conditions for learning 2) knowledge finding 3) knowledge connection 4) knowledge discussion and 5) knowledge presentation. It appeared from teachers' responses to the open-ended question of this standard that their students have touched upon these stages in one way or another.

However, during the lock-down, teachers experimented many new technologies and went deeper into the already existing ones. According to Roger (1995) there are five stages involved in the adoption of new technologies that starts with knowing about this technology and ends in the decision to adopt this technology amongst groups of people. In order to build knowledge using a digital tool, this requires sufficient familiarity with its components until knowledge can be built effectively. Another noted observation is that this standard primarily requires a middle-level thinking skill which corresponds with the implication of the cognitivist theory where the emphasis is placed on practicing intellectual activities and producing outcomes that provoke thinking and stimulate the brain to visualize different perspectives of information.

4.1.2.6.3   The Three Low-Rated Standards

The three low-rated standards by the participating teachers were Global Collaborator, Innovative Designer and Computational Thinker. These three standards were aimed at learners able to expand their knowledge and skills to a wider community outside of their classrooms, engage in a design process that helps solve problems and develop imaginative solutions while developing and using algorithmic methods to understand problems and develop and test these solutions in an automatized way. Qualitative responses to these three low-rated standards showed less skillful practices by students from the perspective of their teachers. Teachers reported that their students engaged in high-profile activities with people and experts from different nationalities, but the frequency of

responses were limited to a small number which suggests that these activities were initiated by fewer number of students and teachers. Qualitative responses also showed lack of in-depth explanation of how students behaved academically as innovative designers and computational thinkers. Although some encouraging responses were reported, but they could only be viewed as attempts to demonstrate efficiency in these standards. Responses only reflected the means not the outcomes. The latter two standards emphasized the importance of learners being computational thinkers and innovative designers to solve problems and test solutions. Whilst this was somewhat absent in responses, it indicates that students were not quite ready to reach that point.

Studies showed that design thinking is an effective thinking approach in creative problem solving as concluded by Lee et al., (2019), while the study by Kim (2019) showed that higher ability design process and problem analysis were a manifestation of incorporating computational thinking in education. The study conducted by Jie et. al (2016) also explored the intercultural global communication as an aspect of the connectivism theory and concluded that intercultural communication can be enhanced by the application of the principles of connectivism in language acquisition.

However, the zone of proximal development might not yet have been reached at this stage with the study sample which requires teachers and students to exert more effort to show off their talents and bridge this relatively bigger gaps to demonstrate competency in these three standards. It could also be argued that skills embedded in these three low-rated standards are related to the constructivism theory which places emphasis on hitting the boundaries of learning and transferring it to a wider context to contribute to the development of the community.

4.1.2.7 Role of Context

The preceding conclusions can be further understood considering the context and timeframe in which teachers worked and the lack of face-to-face interaction between them and their students that was essential for adequate enhancement of their skills. This supports the findings by Paechter and Maier (2010) who revealed in their study that students showed positive attitudes towards both face-to-face and online learning. Their preference of online learning was because it gave them self-confidence and provided coherent and structured material, while their preference for online learning was for its potential to facilitate communication and develop shared understanding which can better be derived from interpersonal interaction. However, implications from these results also suggest

that the three participating schools were on their way towards meeting international standards. This would require much confidence, extensive digital learning experiences and, more importantly, sufficient time to transition from one standard to another, which can purposefully be reached when schools return to normal day to day operation.

4.1.2.8 Disparity between Quantitative and Qualitative Data

It was subjectively observed that there was notable disparity between numerical and textual data obtained from the questionnaire. This could be owing to insufficient familiarity of teachers about the ISTE Standards and/or their possible reservations to select lower scales due to a feeling that the tangible achievements they made in a critical period of time, as far as the researcher was concerned, shouldn't be undermined. Qualitative responses showed that teachers reported highly-considered descriptions on the top-rated four standards which cited an example of the ability of their schools and themselves to overcome the challenges caused by the COVID-19 pandemic. Despite being less frequent, responses on the fifth-rated standard showed promising direction towards the beginning of taking ownership levels at the local and global contribution. Much work may still need to be done by teachers and students to take advantage of the available technologies and become innovative designers and computational thinkers.

4.2 Interviews: Data Analysis and Discussion

4.2.1   Introduction

In this part, data analysis and discussion of results obtained from the interviews with the Arabic heads of departments (HODs) are presented. Responses from the Arabic HODs were aimed at answering the second study question: *What are the perceptions of Arabic language leaders on students' implementation of digital learning in their schools?* These responses were expected to deepen the understanding of responses provided in the questionnaire that was filled out by the Arabic teachers and provide more insight into the vision of the Arabic department in these schools pertaining to digital learning facilitation in the difficult situation of COVID-19.

4.2.2   Participants

Three Arabic language Heads of Departments (HODs) participated in these interviews. Each HOD came from one of the three participating schools. In this analysis and discussion, HODs are referred

to as *BL1* for one British school Arabic leader and *BL2* for the other British school Arabic leader, while *AL* refers to the American school Arabic leader.

4.2.3 Data Analysis

Interviews were held in Arabic language and the recordings were transcribed. Qualitative thematic analysis was undertaken, and excerpts related to the study question were translated into English. Tables 14-17 below show the thematic analysis of the interviews where all responses to the questions were analysed into themes, codes and definition of these codes.

Table 14: Themes, codes and definition of codes extracted from Arabic leaders' responses to the interview opening question

Opening Question	Themes	Codes	Definition of Codes
Describe in brief your experience as an Arabic leader with the transition to distance/blended learning due to the COVID-19 Pandemic.	Prevailing emotional disturbance	Fear, anxiety and pressure	Emotions exhibited by teachers during the transition from face-to-face to distance learning after school closure due to the pandemic
	Preparing for transition	Urgency for good planning	The need for Arabic leaders to create suitable plans for the transition to distance learning
		Developing leadership capabilities	The need for Arabic leaders to build on their existing leadership skills and develop new ones to manage the new situation
		Flexibility of leadership	The need for Arabic leaders to be flexible in their leadership styles to manage the new situation

Arabic HODs expressed that during the pandemic there was a state of fear and worry created by their feeling that they teachers could lose their jobs and the possibility of not being able to cope with the emerging situation. They also knew that the quick transition would lead to extra efforts and burdens on their shoulders. Therefore, they needed to be ready to face challenges with careful planning and rethinking about their leadership capabilities, along with the importance of being flexible because of the instability caused by the situation. Arabic leaders' views in relation to the relevant codes in this question are given below:

> **Fear, anxiety and pressure**
> **BL1:** *"....Before the Pandemic, learning was fac-to-face and I used to see 100% students in the classroom. There were no precautions or fear, and things went smoothly."*
> **BL2:** *"....There was some anxiety before the transition. This is something I experienced for the first time as a leader."*

AL: *"....When the pandemic broke out, there was huge psychological pressure which all teachers faced. This is because of their fear to lose their jobs which affected their performance in the beginning."*

Urgency for good planning
BL1: *"....After the pandemic spread and all schools started to be cautious, we had to take actions, knowing that we will not be physically present in schools. So, we had to set a plan very quickly and embed serious actions regarding our transformation from face to face to online learning". "....Within two days, we created a learning platform and started to train teachers immediately and deal with all the details."*

Developing leadership capabilities
BL2: *"....This required strong leadership skills to cooperate with teachers, especially those who are open-minded and appreciate the concept of transition." "....One of the most important leadership skills at this time was transformational leadership and individualized consideration for teachers because I tried to see the technology strengths every teacher had" "....I also adopted the relationship trust model because teachers wanted to feel confident especially when they were working from home and not observed."*
AL: *"....The whole team needed support from the school leadership in this stage".*

Flexibility of leadership
AL: *"....We followed a collaborative style of leadership. Teachers shared their opinions and what they could do. I gave the opportunity to all teachers to engage in problems and find solutions. In the beginning of the pandemic, we used this briefly because if the full chance is given during difficult times, a lot of time will be wasted, and this is the issue with this style of leadership. This is why I sometimes use the commanding leadership style when there is too much controversy".*
AL: *"....I varied the leadership styles according to the situation and the key word here was 'flexibility'."…. "...I could be wrong sometimes, but in the end, what proves effective is what will be used."*

Table 15: Themes, codes and definition of codes extracted from Arabic leaders' responses to interview question (1)

Question 1	Themes	Codes	Definition of Codes
Tell me about the readiness of your Arabic department to use digital learning tools before and after the pandemic.	Collaboration of efforts	Collaboration with other departments	Arabic department had to collaborate with other departments in the school to reach a unified approach.
		Encouraging Teacher-collaboration	Arabic leaders facilitated the communication between to teachers to brainstorm ideas for teaching and learning in a new environment.
	Unlocking technology potential	Real-life outcomes	The applicability of technology to encourage students to produce outcomes related to their reality.
		Trial and error	The need for leaders and teachers to practice new techniques and see what works and what doesn't work.
		Extending achievement	Building on previous advancements in digital learning before the pandemic.

In reply to this question, the Arabic HODs asserted that they had to collaborate with other departments in the school to make sure there was unity of thoughts. Teachers within each

department had also to communicate with each other to follow the main directions agreed by the departments with a focus on making technology outcomes relate to their own life experiences. The Arabic HODs, as well as the teachers, had the flexibility to try and err with various technology tools. The Arabic leader in the American school explained that the use of technology was not a big issue for them because their students had had access to various digital tools before the pandemic and what they did was primarily an extension of what they had started before. Arabic leaders' views in relation to the relevant codes in this question are given below:

Collaboration of efforts
BL1: *"....In the beginning, we met as leaders after school time, every department; not only the Arabic department, to collaborate and share ideas and practical applications that can be used. We then chose the best of them. After that, HODs refined these ideas and I enacted what fitted with Arabic, because as you know Arabic language has its own different nature from other languages and subjects."*

Encouraging teacher collaboration
BL2: *"....Brain storming; we met with teachers and shared ideas on activities that were more engaging for learners".*

Unlocking technology potential
BL2: *"....There was also a difference in the technology-based learning outcomes. Previous learning outcomes were dependent on the paper and pen, not something published students can do. Learning outcomes became much more related to real life instead of limited learning outcomes between the teacher and students. The student by himself can use these learning outcomes to build a personal profile."*
BL1: *"...we were perplexed about what to use for communication, Zoom or MS Teams? In the beginning, we used Zoom for one week then we found out that its technical issues were a lot, and this disrupted teaching and learning"..."we decided to use MS Teams and that was the right decision for us as Arabic department". "....At this time, we used K'Nex Classroom and some apps that are used in classroom like Quiz Sans, Quizlet, Skisso, Minin, Meters and Nearpod. We tried our best to raise teachers' awareness of these apps, so they become able to use what best suits his/her class, so they do not get bored."*
AL: *"....The main goal of the school was to maintain the digital fluency of our students". "....We used to use robots to enhance students writing skills. We also used it to promote their reading skills and we used virtual reality glasses". "....Students also created their own robots. For example, they used Hummingbird to design and programme robots". ".... our goal was to further empower and enable teachers to use these skills and technology during Corona and we mainly focused more on the content". "....It was an extension to what we had been using in a different situation and different way". "....They had very good technological potential but currently there are some obstacles."*

Table 16: Themes, codes and definition of codes extracted from Arabic leaders' responses to interview question (2)

Question 2	Themes	Codes	Definition of Codes

How different was the integration of digital learning tools across different age groups?	Dealing with technology	Alternative and suitable options	In order to accommodate all age groups of learners, there is a need use variety of tool and ways to address every learner.
		Working off student energies	During the pandemic, there was a focus on how best students' talents can benefit from using the power of technology.
	Setting high expectation	The knowledgeable other	In order to overcome any variation in using technology across different ages, digitally expert students were assigned to different groups of learners.

The Arabic HODs expressed a variation in their opinions with regards the effective use of technology across students age groups. One British school leaders thought that there was going to be a difference, but later on, she realized that it was not a significant one. However, their responses focused on finding solutions to include all learners by creating suitable and alternative solutions and unlock their students' digital energy. They also encouraged the contribution of expert students in technology to support other learners and, thus, set high level of expectations. In spite of the toughness of that time, students were able to demonstrate unexpected skills in using technology. Arabic leaders thought that technology during this time should have been linked to students' preferences and their own talents and capabilities. Arabic leaders' views in relation to the relevant codes in this question are given below:

Alternative and suitable solutions
BL2: *"....Franky speaking, I expected that there would be a big difference, but in fact I can't say that it was so, because they are secondary students, and they are used to technology.". "....It was previously decided to go on a physical trip, but we were not able to do it. How can we then compensate for that? so we thought of a virtual journey and in what way we can do that and what challenges we might face and how we can overcome them and break the barriers before we face them."*
LA*: "....Of course, there was a difference". "....There is a difference in terms of students' skills. Year 9 and 10 have particular programmes that they use, which doesn't require a lot pf programming and use. The application of computational thinking is less frequent in year 9 and 10. However, in Year 11 and 12, their abilities to apply technology in projects and project design is based on how they think of technology and its applications".*

Working off students' energies
BL2: *"....Students had lots of feelings that they were unable to express and had energies that were worked off through technology. There were no physical activities or socializing with their friends and all communication took place through technology. We helped our students use their skills in singing, drama, press and created a sense of ownership where they could add their names on their contributions".*

The knowledgeable others
BL2: *"....Students worked together to explain things to each other, and many tasks focused on forming group. We also encouraged the approach of the Expert Person who has strong technology*

skills, and these persons were distributed across groups. This was clearly effective when we carried out the virtual trip using Google Earth".

Table 17: Themes, codes and definition of codes extracted from Arabic leaders' responses to interview question (3)

Question 3	Themes	Codes	Definition of Codes
Describe how the Arabic department facilitated communication within the school community as well as the openness and communication with the outsider world.	Setting communication routes	Internal communication	Ways to engage students in activities that the require their communication in same grade level or across the school
		Internal communication	Ways to engage students in creative activities outside of the school boundaries, whether locally or globally.

In response to this question, Arabic leaders replied that they engaged their teachers and students in a variety of communication activities. The focus seemed to have been within the school boundaries but went further outside of the school community. Responses referred to the creation of e-spaces for overall school activities and e-systems to manage their study courses within the school. They also formed communication groups to practice speaking skills. The leaders also expressed that students communicated with in charge officials outside of the school to enrich their learning and they ran interviews with parents and schools in other countries. In addition, students created websites to publish students' views on general topics. It also reported that external communication took place at a narrower scale and was made as an available option to achieve specific learning outcomes. Another Arabic leader stated that students used role playing a substitute for not being able to reach a community or individuals outside of school. Arabic leaders' views in relation to the relevant codes in this question are given below:

Internal communication
BL1: *"....For me, I was lucky because I have a group who created an e-space for the Arabic language department, and I am also responsible for promoting Islamic values and we have something called Islamic Counsel that is responsible for sharing Islamic morals in the entire school".*
BL2: *"....We created communication groups among students to practice speaking and discussed related topics". "....We used the breakout rooms in Zoom or make four students work as a group and this positively impacted their well-being".*
AL: *"....I agreed with parents and colleagues to create a system to manage electronic courses and it works with a system called Media. We created a comprehensive website so students could interact with one another and with teachers along with parents too". "....On this website, students created their projects according to their own learning outcomes at a particular grade level, and then published them for all students to view".*

External communication
BL1: *"....We were able to get students to communicate with individuals outside the school. Many students have already conducted interviews with a number of schools in Europe. During our work*

on the Sustainable Goals project, some of the tools that the student researcher uses is to run an interview and collect information. There were also students who were able to run interviews in Arabic with non-native speakers and they collected information and included it in their papers".".....This occurred at a narrower scale to be honest. Not all students used this, but it was an available option".

BL2: *"....Depending on the topic, we got students to communicate through interviews with parents or their relatives or other individuals who have specific roles and responsibilities. For example, there was a topic entitled 'Effective characters' and students' role was to try to reach out to them and run an interview. If not possible, students performed role play to dress up their characters".*

AL: *"....Another example, some students uploaded news reports and we had a communication channel with an in-charge department in Al Arabia TV channel here in the UAE. Students communicated with an in-charge individual in the channel and prepared news reports with them. They then came to class to read the news on a daily basis. This created a lot of positive reactions and drew the attention of students and parents".*

Table 18: Themes, codes and definition of codes extracted from Arabic leaders' responses to interview question (4)

Question 4	Themes	Codes	Definition of Codes
How did the Arabic department supported teachers and students in applying problem solving strategies using technology?	Overcoming obstacles of digital problem solving	Necessity for teacher and leader PD	Leaders and teachers still need more training in how to integrate digital technologies to help design digital products which provide solutions to existing issues.
		Subject-specific Challenge	Particular attention needs to be given to the teaching and learning of Arabic language to integrate digital problem solving in this process.
		Scaffolded practices	The potential of the tremendous benefits students made during the pandemic to be built upon in the near future for higher digital skills.
	Encouraging critical thinking	Computational and design thinking	The ability of students to use specific thinking routines and use the computer language to provide designed solutions to real-life problems.

As reported by the Arabic leaders in response to this question, problem solving using technology required teachers and HODs to engage in professional development training to further promote this skill in learners, given that there was a challenge pertaining to nature of Arabic language teaching and how technology can be used to enhance digital problem solving. It appeared from the responses that technology was already used as a way to offer solutions to real life problems by creating websites and blogs and publishing students' opinions on them or creating specific designs that simulate real-life ones. However, the skill of producing digital outcomes by following a specific design process to solve and test problems was not evident in their responses. Nevertheless, in the American school, the Arabic leader referred to an advancement with regards to digital designing and computational thinking. He indicated that a great percentage of students engaged with the creation of robots and computer devices in their initial stages and they brought in experts in

programming and coding to support students with accomplishing this task. Arabic leaders' views in relation to the relevant codes in this question are given below:

Necessity for teacher and leader PLD
BL2: *"....Teachers still need professional development to learn how to design collaborative activities to solve problems."*

Subject-specific Challenge
BL1: *"....For us, as Arabic department, the concept of problem solving takes different forms because as you know our subject doesn't have experiments. If it was like math's or science, solving problems will be more explicit."*

Scaffolded practices
AL: *"....As I mentioned, they used this as a means not as a solution. For example, a student may create a blog or a website and publishes material on it. Some students created material and published it on their social media to raise the awareness of the youth about women's rights and the seriousness of violence against them. Doing so, they serve the community and use 'problem solving fluency' because this is a real-life problem."*

Computational and design thinking
BL2: *"....As a leader, my responsibility could be that I look for how I can develop that and transfer my experience to teachers and then we carry out PD on this point and identify strategies to solve problems". "....Teachers were able to use visible thinking and could see their students work directly on live documents. The teacher was able to see how students were thinking and this left a strong impact where the teacher could correct the learning path to achieve the learning outcome".*
BL1: *".... At most, this was about particular problems or human issues they can present according to the topics of their research. For example, we discussed bullying, tolerance, e-shopping. These were open topics that we used to develop their critical thinking". "....I have students who created blogs and took real pictures and talked about them. They presented problems and found solutions. They communicated with people outside and collected data and analysed percentages and statistical data". "....They designed a space city". "....they gathered information and accurate data and thought about initiative they could take to solve the hunger problem which happened at a wider scale because it included more than 300 students at one grade level, but every one of them was thinking of dealing with this differently."*
LA: *"....Students had a project about the environment. They programmed and created a computer from the onset. There were challenges that I faced as a teacher and leader which faced students too in designing a prototype of a computer device as separate parts. The first stage was combining all the parts and the second stage was programming. This was a great challenge for them, so we sought the help of a programming or coding specialist in the school to teach them how coding and programming are done, how the red color moves, how the robot's hand moved. Students then began to learn and I, too, started to learn coding or transforming the robot from pieces to a whole robot that moves and speaks". "....not all students moved in this direction, but they are on the right direction and they will be able to. Our goal is to enable them all. We can say this applies to around 60% or 70% of students"*

Table 19: Themes, codes and definition of codes extracted from Arabic leaders' responses to the closing question

Closing Question	Themes	Codes	Definition of Codes

How would you like students' digital learning skills to be assessed by the school or relevant education entities?	Varying the spectrum of assessment	Self, performance, objective and progress assessment	Arabic leaders aspire to see different forms of assessment of digital learning taking into account the current level of performance of the school being assessed.
		Diagnostic assessment	There is a need to firstly perform prior assessment of digital learning to further understand the reality of technology use before adhering to official assessment processes.
	Other aspects of assessment	Safeguarding and wellbeing	Not only assessment should consider the digital learning skills, but also students' online safety and comfort is important.
		Deliberate assessment of problem solving	Assessment should consider simple evaluation of problem solving at this moment, given that students had acquired a lot of skills and with time they will be able to address higher technological skills at which they can be assessed accordingly.

As indicated in this table, Arabic leaders extensively expressed their views of how the assessment of digital learning should take place in the future. Given the current situation and the new experience with the intensive use of technology due to school closure, Arabic leaders showed that they wanted assessment to take into consideration the level of progress students make; how they were and how they are now. They also indicated that there needed to be diagnostic assessment to determine the starting point of technology application. The leader in the American school emphasized that regardless of what form of technology is used, there needs to be an emphasis on what students know and what they can do. One leader in a British school expressed that other aspects of assessment should include the safeguarding and wellbeing of students. In addition, she recommended that assessment of digital problem solving should be deliberate and that students had gained a lot from this experience and should be ready for more advanced skills in the future. Arabic leaders' views in relation to the relevant codes in this question are given below:

Self, performance, objective and progress assessment
BL1: *"....I think there should be two types of assessment: self-assessment of digital skills for teachers and students". "....Performance assessment of digital skills in their actual context". "....It is important when assessing students' skills to assess their skills before and after."*
LA: *"....Students may use digital apps or a book or any other recourses, but when they are assessed we should map the assessment to what students already know in light of the set objectives."*

Diagnostic assessment
BL2: *"....I think that assessment should be diagnostic in the beginning and specific criteria should be set first to be transformed into actions and operational objectives. The more the assessment is simple to use, the better the outcomes of objectives."*

Safe-guarding and wellbeing

BL2: *"....exactly, what matters to the inspector is the wellbeing of students, their outcomes and the safeguarding."*

Readiness for problem solving

BL1: *"....I would relatively say that the transformation happened very quickly, and students were able to do a lot of things skillfully and competently than expected. Blended learning is still going on and technology is still playing a role which is giving us the opportunity to develop areas that were not well-developed before the pandemic. There is always room and space for development."*

4.2.4 Discussion of Interview Results

4.2.4.1 Mood of Learning and Leadership Style

Responses by the Arabic HODs to the interview questions revealed a common feeling of worry, tension and insecurity when the three school were requested to operate from afar as part of the precautionary measures to curb the spread of the Corona virus. They all agreed that careful and adjustable planning should have been undertaken to address the situation, along with the need to develop existing leadership styles and promote new styles, such as transformational leadership. They also needed support from their senior leadership and identification of individual potentials who had particular skills to create unique solutions. In crisis, transformational leadership is necessary and should be accompanied by a humane, caring and emotional values and communal integrity (Caro, 2016). The study conducted by Supriadi et al. (2020) examined whether transformational leadership had positive impact on the capabilities of innovation of Islamic teachers during COVID-19. Their study confirmed the positive effect transformational leadership had on the abilities of teachers to innovate.

It can also be inferred from the responses that Arabic language leaders were given enough space and flexibility to work by their senior leadership while commanding leadership seemed to have been kept at the minimum. In light of a study conducted by Fotheringham et al. (2020), he suggested the frequency, quantity and quality of top-down communication contributed to a state of stress among the school leaders, while horizontal collaboration and communication between them was encouraging and supportive. However, it was noted that commanding leadership practiced by the Arabic leaders was also present at some points when there was a need to reach a critical decision in case of controversy. This can be understood in the context of COVID-19 situation where there was room for trial and error and experimenting new ideas as well as the availability of numerous options.

4.2.4.2 Personalized Teaching and Learning

An important observation in leaders' responses was the mentioning of the focus on digital activities and outcomes to make them relate to students' lives, their own skills and building personal profiles. This can be attributed to leaders' evaluation of the situation that student in this critical time needed support of a particular kind. They lost their usual social communication both in and outside of the school and stayed at home for a significant period of time. They wanted to make this temporary learning journey enjoyable so that student wouldn't lose the passion for learning. This is supported by the empirical research carried out by D'Alise (2020) which revealed that 57% of students' learning styles interpreted the variation in academic self-efficacy and motivation on distance learning during the COVID-19.

4.2.4.3 Communication

The need for internal communication within the school was also an emerging theme in the responses. The American school created a learning management system for students to manage their studies so that they would not miss a lot of the interaction which was constant on normal school days. This seemed to have been an important practice as found in Rannastu-Avalos and Siiman (2020) where all science teachers reported that they all used learning management systems for information sharing. Despite reporting high level of communication, Arabic leaders seemed to have been confident that they managed internal communication effectively within their departments unlike the findings of the latter study whose participants reported that distance learning was not as supportive to collaborative learning as face-to-face learning. The digital readiness of the three high-performing schools may have contributed to a better communication experience than that encountered by the participants of the study. This readiness for digital learning, with regards to Arabic language teaching and learning, enabled the leaders and teachers to empower their students to use technology effectively. This refers to the viability of Arabic language to be taught and learned in innovative ways using technology. Febriani et al. (2020) recorded the practicality media and digital material integration in teaching Arabic online and noticed the increased motivation and interest of Arabic language students online and their fast responses to produce maximal outcomes. They also concluded that critical thinking, creativity and communication was encouraged through the teaching of Arabic during COVID-19.

4.2.4.4 Higher Level Technology Integration

The preceding conclusions corresponded with the main findings generated from the questionnaire filled out by the Arabic teachers who worked with three interviewed leaders. There seemed to have been an agreement that the three schools made effective use of the technology available to them to unlock the potential of their students. Interestingly, by analyzing the interview responses relating to highly complex use of technology, similar agreement was also noted. Resorting to distance learning in a pressing atmosphere revolved primarily around how this situation could be managed efficiently, given the already existing digital infrastructure and pre-owned digital skills by teachers and students. Nevertheless, there were notable attempts to break the boundaries of the school to the outsider world for further enrichment of students' academic achievement.

It was reported by one Arabic leader that there was a need to upskill teachers to be able to integrate problem solving in a digital environment and enable students to produce digital learning outcomes which provide solutions to particular issues. The complexity of this skill appears to require face-to-face interaction between students and their tutors as supported by the study conducted by (Jurdi et al., 2018). In their study, they concluded that physical spaces were more effective than digital learning platforms in collaborative problem solving. This suggests that the live individualized support practiced by teachers in normal classroom settings is needed for complex learning themes.

Responses on the facilitation of computational thinking showed less application frequency in the three schools despite favorable attempts to try some programming and coding exercises. However, this appears to have been a regular practice in the American school before the pandemic and that a great number of secondary students had access to this kind of experience. The Arabic leader in the American school expressed that their students worked with robot designing and programming, but it was not clear in the interview transcription whether he referred to the time before or during the pandemic. In a later telephonic conversation, he confirmed that this was before the pandemic. He also mentioned in the telephonic conversation that they had started the integration of such technologies during the blended learning phase in the form of VR glasses, 3d printing and the robot hand for creating Arabic calligraphy. However, the use of these skills to offer problem solutions and test them is still not clearly evident. A possible reason, as previously stated, is the lack of immediate support and feedback to conduct highly complex activities during distance learning. This

accords with the findings from the study conducted by Nouri et. al. (2020) who pointed out that computational thinking required a set of skills in addition to normal communication technology skills, namely language skills, collaborative, cognitive, creative problem-solving skills and attitudes.

4.2.4.5 Digital Learning Assessment

Given the ambiguity of the situation which leaders and teachers worked in, their responses on how they wanted digital learning to be formally assessed showed variance in responses motivated by their own evaluation of this subject. They provided a range of assessment methodologies that can be implemented in the near future such as, self-assessment, performance assessment, objective assessment and diagnostic assessment. Students' well-being and online safe-guarding also came in as important aspects of assessment. This sounds to be motivated by the instability in the educational landscape in terms of the use of technology and its application and the desire to start from the current gains and gradually build on them towards a more effective utilization of digital learning.

As such, in the following section, the UAE Distance Learning Evaluation Tool, developed shortly after the onset of school closure, will be analyzed with an attempt to provide transitional assessment strategy of digital learning. This strategy will be motivated by the findings of this study, considering the current gains and losses of technology implementation and guided by the ISTE Standards for Students.

4.3 Document Analysis and Discussion

4.3.1 Introduction

The UAE's Distance Learning Evaluation Tool (Phase 1) was developed by concerned education authorities; the Ministry of Education, Department of Education and Knowledge, Knowledge and Human Development Authority and Sharjah Private Education Authority (KHDA, 2020). This sections provides an analysis of this documents by answering the third study question: '*What is the current status of digital learning assessment in the UAE's Distance Learning Evaluation Tool?*' The tool was aimed at assessing the distance learning activities provided by schools and identifying areas for school development. It was issued at a time when distance learning was obligatory for all schools in the UAE after the surge of COVID-19. The tool was intended to be a starting point for

transition (Phase 1) from regular learning activities to a more sustainable distance learning which is based on modern technologies and methodologies, as explained in the policy statement. Until the moment of conducting this study, no other documents were issued with regards phase 2 of the assessment. This could be attributed to the desire for further understanding of the education reality in the exigent situation to be able introduce a more comprehensive policy adequate for the forthcoming phase.

4.3.2   Analysis of Document Structure

The document consisted of 11 pages and identified three zones of school assessment as indicated in tables 20 and 21 below:

Table 20: Overall structure of the UAE's Distance Learning Evaluation Tool

Zone / Active player	Zone 1: Students' distance Learning and Wellbeing	Zone 2: Teaching and monitoring students' learning	Zone 3: Leading and managing students' learning
Students	**12 descriptors** - 5 themes		
Teachers		**10 Descriptors** - 2 themes	**2 Descriptors** - 1 theme
Leaders			**5 Descriptors** - 3 themes
The school			**2 Descriptors** - 1 theme
Parents			**3 Descriptors** - 1 theme
Governors			**2 Descriptors-** 1 theme
Distance learning Provision		**3 Descriptors** - 1 theme	

Table 21: Distribution of the assessment themes by active players in the UAE's Distance Learning Evaluation Tool

Zone / Active player	Zone 1 Themes Students' distance Learning and Wellbeing	Zone 2 Themes Teaching and monitoring students' learning	Zone 3 Themes Leading and managing students' learning
Students	• Attendance and Participation • Safeguarding • Learning opportunities • Equity of Access • Wellbeing		
Teachers		• Planning and Delivery • Monitoring and assessing learning	• Communication and Engagement
Leaders			• Agility • Contingency • Communication and engagement

The school			• Resource Management
Parents			• Communication and engagement
Governors			• Communication and engagement
Distance learning Provision		• Distance learning Provision	

As shown in tables 20 and 21, the three zones of assessment were as follows: **Zone 1:** Students'
distance learning and wellbeing, **Zone 2:** Teaching and monitoring students' learning and **Zone 3:**
leading and managing students' learning. These three zones comprised 13 themes where zone one
shared five themes, and zones two and three shared four themes each. The 13 themes comprised 39
descriptors required to be exemplified in a number of active players in the education sphere.

4.3.3   Analysis of Student Descriptors

On reflecting on the descriptors for students, it was noted that they relied on two aspects: 1) ensuring
availability 2) ensuring action. Ensuring availability refers to the phrasing of a descriptor in a way
that reflects students' access to a particular service. Contrastingly, ensuring action refers to the
phrasing of a descriptor in a way that reflects an action to be taken by students. The following table
displays the distribution of the 12 descriptors on the two aspects:

Table 22: Distribution of student descriptors by ensuring availability and ensuring action in the Distance Learning Evaluation Tool

Ensuring availability	**Ensuring Action**
Have clear guidance about online safety and cyber bullying, including who to contact if they have concerns	Attend and participate in the learning sessions and activities
Feel safe when working online and know how what actions to take if safety issues arise	Conduct themselves in a respectful manner
Experience balance of learning methods	Maintain continuity and momentum in their learning
Have equitable access to the school's distance learning material	Have the resources/technology skills to access distance learning
Have opportunities to connect with their peers and teachers	Able to manage their workloads
Know who they contact if they need to discuss wellbeing concerns	Have an average balance time between screen time and other learning activities, including regular breaks and physical activity

This analysis captures the author's philosophy in setting the priority of the assessment process to rest on schools in providing the greatest possible opportunities that allow students to engage in learning. This was also to guarantee that students are not deprived, by any means, of this right to learn. This was depicted to the extent that students' descriptors in the document, in large part, resided with schools and their primary responsibility to allow for equal learning opportunities during tough times. This can also be interpreted in the context of the UAE education policy makers seeking to ensure that the main beneficiary of education, i.e., students, engaged in uninterrupted schooling even in the most difficult circumstances the world was experiencing.

Findings from the questionnaire and interviews conducted in this study revealed that students in the three schools have exceeded the expectations set in this document at various levels. They extensively used technology to empower their learning outcomes and engaged with virtual knowledge in a productive manner, despite some limitations in adopting higher level technological solutions that were justified in the context of the pandemic. Therefore, setting high expectations could be considered in the subsequent stages of digital learning assessment, and particularly placing the emphasis on the development students' digital learning skills rather than how learning with technology was taking place.

4.3.4   Context of the Document Development

Under normal circumstances, the analysis of this document could have included a comparison to international standards, but this was not initiated due to the fact that this tool was developed in an unprecedented experience whose consequences were unpredictable. In addition, the development of this tool was a preliminary attempt to assess distance learning in schools and other stages would follow to further assess learning with technology. Therefore, this analysis aims to understand the current situation of digital learning assessment in an attempt to put forward some perceptions to consider when looking at how technology was utilized in teaching and learning.

4.3.5   Value of the Analysis

In all cases, the analysis of this document depicted, in the students' part, the author's desire to promote students' learning opportunities and reduce the burden on their shoulders in difficult

circumstances. However, and interestingly, by contemplating on this study findings, the three high-performing participating schools made achievements, against international standards, beyond the expectations set for this period of time. Since these schools operate in the UAE and received formal high rating, they can be seen as a reference for the assessment of practices undertaken at this time in other schools. It should also be considered that this study sample is purposeful and not a representative one. Nevertheless, it still gives us an initial picture of how digital learning took place during this time. The findings of this study can be further supported by conducting other studies that include a wider range of schools and curricula for the preciseness of any future assessment processes of learning with technology.

It is worthwhile to mention that this study used the ISTE Standards for Students rather than the ones used for educators or educational leaders. This is because of the assumption that the priority in knowing whether there was a real change was to look at students' learning outcomes, which in turn reflects the efforts made by schools, teachers and leaders to help them fulfill these outcomes.

Building on this analysis, and in light of this study findings, it may be necessary that future school assessment processes focus on digital learning rather than distance learning. The rationale behind this is that the acquisition of digital learning skills is the baseline needed to apply technology in teaching and learning, whether these skills are practiced online, offline, anywhere or at any time. Additionally, students' demonstration of high competency in digital learning reflects their ability to utilize technology in its various forms, and that assessment goals focus primarily on what knowledge students gained and what skills they acquired, and not only what procedure was taken to facilitate their journey. Procedure can be good, but the achieved learning may not meet the intended expectations. That said, students' demonstration of digital learning skills gives schools, teachers and leaders the flexibility to adopt whatever procedure they deem appropriate to deal with multi-variable situations whilst keeping a close eye on students' learning outcomes.

4.3.6 Reality-Based Assessment Criteria for Digital Learning

Given the findings from the questionnaire and interviews which explained the reality of digital learning in a selected number of high performing schools, the following is a proposed outline of reality-based assessment criteria that can be used as a precursor to the development of a more

sustainable future assessment of digital learning skills. These criteria tend to be more applicable once the pandemic, which was still outbreaking during the implementation of this study, has passed. These reality-based criteria for digital learning assessment are informed by the study findings from teachers and leaders in three high-performing schools in Dubai who adopted distance/blended learning during the pandemic. The proposed criteria draw up on the International Society for Technology in Education (ISTE) Standards for Students. They also take into account the situation at this time and the maximum level of digital learning implementation achieved by the participating schools to constitute a precursor for future digital learning assessment.

Furthermore, the proposed assessment criteria consider the gaps found in certain elements of the ISTE Standards for Students, as reported in the questionnaire and interview results. They also set marginally higher expectations to bridge this gap for the time being, particularly in computational thinking and innovative designing. Below are the proposed digital learning reality-based assessment criteria to be considered during the transition to blended learning and the initial stages of regular face-to-face learning:

1. **Digital Learning Outcomes**
   Students use a variety of digital learning tools which reflect the achievement of their learning outcomes:
   - Create their own learning objectives and apply digital skills to achieve them.
   - Present their learning outcomes using textual, audio and visual digital tools.
2. **Digital Responsibility**
   Students realize their responsibilities when using electronic and networked devices:
   - Apply school's policy with regards to the use of technology.
   - Reference trusted electronic sources and acknowledge the work of others.
   - follow legal paths to report suspicious online acts.
3. **Internal Communication**
   Students use the available learning platforms to communicate effectively with teachers and peers:
   - Create their own electronic spaces on platforms relating to curriculum topics.
   - Organize and participate in interactive learning activities on platforms to enrich their learning outcomes.
4. **Knowledge Formation**
   Students build their knowledge using digital tools to reflect higher order mental processes and metacognitive skills:

- Analyze and evaluate knowledge on the virtual reality and follow specific methodology in their analysis and evaluation.
- Build their own knowledge and present it using a variety of digital learning tools.

5. **Broader Communication**

   Students engage in virtual to enhance their knowledge and consolidate their skills:
   - Participate in local or international events outside of their school community
   - Communicate with external individuals, experts or organizations to deepen their understanding of local or global topics.

6. **Digital problem solving**

   Students create digital designs and artifacts by following a design process and basic computational skills to solve subject topic-related problems:
   - Develop digital prototypes and minimum viable products to offer solutions for simple problems.
   - Transform information into simple numerical data and statistics and provide solutions to specific problems.

As can be inferred from the above proposal, the digital learning assessment criteria considered six aspects of assessment. These aspects reflect the order of rating reported by participating teachers on the study questionnaire. Each aspect reflects the current gains presented in the study questionnaire and interviews with little higher expectation than the already existing achievement. For example, findings from the questionnaire and interviews did not refer to students creating their own digital goals. It could be claimed that the time of COVID-19 may have imposed a degree of control by teachers and leaders on students' learning. However, findings of this study concluded that students reached a confident level of manipulating digital tools. This creates a need to allow students to practice some degree of independency and responsibility of their learning. It can also be noted that thinking in a designing and computational manner were merged in one aspect of assessment. This accords with this study findings which uncovered that these skills still require further attention. Therefore, the drafting of the above assessment criteria considered lower expectations than those originally found in the ISTE Standards. However, a degree of challenge is still considered to reflect a realistic size of the zone of proximal development.

4.3.7 Summary of Findings

This chapter presented the findings attained from the administration of the questionnaire with Arabic language teachers and interviews with Arabic language heads of departments on their perception of the use of their students' engagement with digital learning during the COVID-19

Pandemic. The study tools used the ISTE Standards for Students as an umbrella to understand the status of digital learning in schools from an international standpoint. Findings revealed that the three high-performing schools participating in this study showed remarkable student implementation of digital learning which exceeded the national expectations of assessment at the cognitive and internally communicative levels. However, at the broader communication and the higher digital level of technology implementation, students showed some attempts that were still insufficient to meet international standards. Nevertheless, there were indications that with the regression of COVID-19 and returning to normal schooling students will potentially exhibit more sophisticated use of technology in their learning by virtue of what they earned during this time. This standpoint informed the analysis of the UAE's Distance Learning Evaluation Tool developed after school closure. The analysis led to the development of a precursor reality-based assessment criteria for digital learning in line with the current level achievement obtained by the three high-performing schools participating in the study.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study addressed a contemporary issue in education to which inclusive attention needs to be paid. The impact induced by the lock-down of schools for a significant period of time due to the surge of COVID-19 will have its consequences on education in the near, and possibly, distant future. Understanding how schools operated during the pandemic is a vital necessity to keep pace with the expected forthcoming transformation in education. This understanding should enable education decision makers to develop the most appropriate assessment frameworks for education systems so that they will not dissipate the learning gained from the technology opportunities given to students during this time. There is a need for those concerned with education to be prepared for a new era of schooling. Knorr (2020) predicts that education "will undoubtedly be reshaped by the force known as COVID-19" while the reshaping method will not be equal for everyone (Nihan et al., 2020).

Findings of this study revealed that Arabic language teachers and leaders' perceptions towards students' digital learning, in three high performing private schools in Dubai, were positive and reflected effective practices against most of the International Society for Technology in Education (ISTE) Standards for Students. The study indicated that four international standards were adopted at a notably higher level of digital involvement, awareness, cognition and communication. Despite the noteworthy attempts, the three other ISTE standards pertaining to computational thinking, creative designing and global collaboration still require more effort to be exerted. Findings also implied that there was a high potential for the participating schools to fulfill these standards when education life returns to normal and schools resume regular face-to-face activities. Additionally, the results of this study informed the drafting of a set of a reality-based digital learning assessment criteria to be viewed as a starting point towards new thinking around how students' digital learning skills can be assessed. These assessment criteria articulated six aspects of assessment which took into consideration the level of achievement by the participating schools and were built on the realistic accomplishments made by these schools.

It is highly encouraged that those concerned with education realize that the success of digital learning is highly dependent on the degree to which schools, leaders, teachers and students are well-equipped and exhibit positive attitudes towards the use of digital technology. Reflecting on the

implications of teachers and leaders' responses in this study uncovered a great deal of passion for digital learning to produce meaningful outcomes, which unlocked the potential of learners and broke the boundaries of school to a new phase of openness to the world. Despite being said in 1916, considering this quote by John Dewey would make the transformation we aspire in our education systems: "If we teach today as we taught yesterday, we rob our children of tomorrow".

5.2 Recommendations

Since this study explored digital learning, as an aspect of an unprecedented phenomenon in education, findings are recommended to be interpreted by considering the temporary application of digital learning during this time. This suggests that some factors contributing to the emergence of these findings might not exist in normal education settings. For example, the amount of exposure to technology may decrease once school activities return to normal, which may slow down the pace of digital skills development at the expense of more social and human interaction in a real world. The main focus of the present study is to bring to light the extent to which students developed digital learning skills which might not have been attained without school closure due to the outbreak of COVID 19.

With that in mind, educational practitioners can view the findings of this study as indication to how students' attitudes and behaviours will be towards technology in the future. They need also to consider the progression of digital learning skills and the degree of complexity that they entail. This perspective should inform the way they integrate technology in their classrooms and the need to start from the current level of competence. Schools may become more aware of what other high performing schools have achieved during this time. They may take advantage of this awareness to rethink about technology integration guided by the practices demonstrated by high performing schools and keep pace with the mandates of the education market. Education authorities may also use the findings of this study to restructure assessment policy expectations for schools. Furthermore, they may draw on the reality-based assessment criteria developed in this study whilst being mindful of the variation in technology infrastructure across different schools.

5.3 Further Research Areas

The need for accumulative literature on this subject seems to be fundamental because of the impact that COVID-19 is expected to have on education for several years. It is recommended that widening of the sampling scope of the present study in future research may generate findings that could be generalizable on larger communities. Since the present study explored the perception of Arabic teachers and leaders on students at the middle and education, future research may focus to how younger primary students' digital learning was impacted by school closure. It is also recommendable to explore how school closure affected students with special education needs and whether or not they required specific support with digital learning. Eventually, conducting aptitude studies that offer predictive analyses of the competencies of school leaders, teachers and students can provide great input for envisioning the future of the next phase in education.

CHAPTER 6: LIMITATIONS

The present study collected data from Arabic teachers and leaders in high-performing three private schools to inform the drafting a precursor benchmark assessment of digital learning. As such, the generalization of this study findings would be consistent if the study sample included a larger number of schools with different curricula and varying official rating level. Additionally, because of the relatively small sample size as a purposeful one, quantitative data obtained from the questionnaire tended to be more optimistic than the qualitative data obtained from the open-ended questions on the open-ended questions as well as the interviews with Arabic leaders. However, adopting this mixed method approach to data collection seemed to validate the overall interpretation of results. Furthermore, since this study explored digital learning during the COVID-19 pandemic, there were limited studies on the impact this pandemic had on the development of students' digital learning skills in order to frame and validate the interpretation of findings. Therefore, this study can be seen, along with the few available others, as a step forward for further research and exploration. Another possible limitation is the researcher's probable bias in identifying the study sample to provide rich information on the researched area. The researcher worked closely with a considerable number of schools within the Arabic departments and realized the notable progress made by the three participant schools. However, the fact that these schools were highly rated according to the KHDA inspection framework report may have neutralized the influence of this selection.

CHAPTER 7: APPENDICES

7.1 ISTE Standards for Students
The International Standards for Technology in Education can be retrieved from this link to the ISTE organisation: https://bit.ly/33seIHF

7.2 Questionnaire Form
The study questionnaire can be retrieved from this link: https://bit.ly/2VfvJQS

7.3 Interview Protocol

Interviewer: _____
Interviewee: _____
Date: _____
Location: _____
Time of Interview: _____
Gender: _____
Age: _____
Years of Teaching Experience: _____
Years of Leadership Experience: _____

- Do you give permission to record this interview session?
- Do you give permission to use your responses for the purpose of exploring your perceptions as a school leader on the digital learning experience in your school during the COVID-19 pandemic?

Opening Question:
Describe in brief your experience as an Arabic leader with the transition to distance/blended learning due to the COVID-19 Pandemic.

Main Questions:
1. Tell me about the readiness of your Arabic department to use digital learning tools before and after the pandemic.
2. How different was the integration of digital learning tools across different age groups?
3. Describe how the Arabic department facilitated communication within the school community as well as the openness and communication with the outsider world.
4. How did the Arabic department supported teachers and students in applying problem solving strategies using technology?

Closing Question:
How would you like students' digital learning skills to be assessed by the school or relevant education entities?

7.4 UAE's Distance Learning Evaluation Tool
The UAE's Distance Learning Evaluation Tool can be found via this link to the KHDA website: https://bit.ly/3lnRvMJ

7.5 Email Template for Permission Request

Dear ……,
Trust you are well and safe!

My name is Abdelfatah Ghozlan, Teacher Training Manager at ……….. I am doing my masters dissertation at the British University in Dubai on the perceptions of Arabic language teachers and leaders on students experience with digital learning during the COVID-19 pandemic. The sampling technique is a purposeful one where participating schools may share rich information pertaining to the area of investigation.

That said, I learned that your school has gone a long way and made impressive strides in this regard during this extraordinary time. Therefore, I am really hopeful that I can get approval to carry out the following with the Arabic language teachers and leaders in the school:

1. Administer a questionnaire on Arabic teachers' perceptions on their students' experience with digital learning.
2. Conduct an interview with the Arabic leader to talk about his/her own experience in this context.

Should you offer your consent, I will assume responsibility for keeping the identity of the school, teachers and leaders' identity anonymous in the study and any related work whatsoever, unless otherwise explicitly stated from your side.

Thank you and looking forward to your kind reply!

Kind Regards,
Abdelfatah Ghozlan

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