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Radical Solutions in Palestinian Higher Education

Research from An-Najah National University

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Radical Solutions in Palestinian Higher Education

Research from An-Najah National University

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Foreword by Prof. Mohamed Jemni

Palestinian universities have been making intensive efforts to develop education and to harness modern technologies toward enhancing the efficiency of the educational process and improving the quality of its outputs.

Palestinian universities are, in fact, among the first Arab higher education institutions to have adopted e-learning and open education. This is, first, because these methods are more appropriate to the difficult conditions experienced by these universities where face-to-face classes could, for various reasons, be disrupted; and second, because Palestinian universities are keen to keep pace with rapid technological advances and to leverage technology for purposes of capacity development, especially that Palestinian academics possess a high level of competence and expertise in this field. And, we at the Arab League Educational, Cultural and Scientific Organization (ALECSO), having continuously engaged with Palestinian educational leaders and institutions in various joint activities and projects, can actually testify to this.

Among the distinguished Palestinian achievements and contributions, we can particularly mention the several awards won by Palestinian youth in ALECSO's Mobile Apps Awards, as well as their active engagement in ALECSO's OER project. Moreover, Palestinian schools and students have had an excellent performance in the recently held Arab Code Week (2020). Over 200,000 students from 21 Arab countries took part in this event in which Palestine ranked first in terms of number of participants and won top prizes in contests held for students and schools.

This book is a quality reference in the field of modern educational technologies, especially in terms of e-learning and open education. It comprises a set of valuable chapters authored by prominent researchers from the Palestinian An-Najah National University, a prestigious higher education institution and one of the largest in terms of number of students. I previously had the opportunity to cooperate with many distinguished researchers from this university.

It is, therefore, with great pleasure and honor that I write the preface to this very useful book which I highly recommend to all academics and researchers across the Arab world.

Prof. Mohamed Jemni
Director of ICT at ALECSO
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Foreword by Prof. Katherine Wimpenny

I have had the pleasure to collaborate with Prof. Saida Affouneh and respected faculty colleagues at An-Najah National University (West Bank) on the design and delivery of a joint teacher–researcher development program, highlighting the uses of qualitative research approaches, and the process and requirements of scholarly publication in leading international journals.

It is evident that conducting qualitative research in the Arab world is a new and emerging trend which is required not least to question the legitimacy and utility of the inherited system of higher education prevalent in Palestine (Abu-Lughod, 2000). It is clear ANNU is working hard to strengthen its research reputation and serve as an education leader not only locally to meet community needs in sustainable economic, technical, and human development, but also globally.

My collaboration with Saida at ANNU was initiated through our rich partnership work on OpenMed an Erasmus+ project (2015–2018) with a Consortium of 13 partners across Europe and the South-Mediterranean (S-M). OpenMed focused on the adoption and piloting of open educational practices and open educational resources in S-M countries as a bottom-up approach to support the modernization, accessibility, and internationalization of HEIs. Additionally, along with Prof. Daniel Burgos, from the Universidad Internacional de La Rioja, also a partner in OpenMed, we have been Visiting Professors at ANNU, engaging in the doctorate study summer schools, as well as being facilitators on the Ph.D. program in Education.

Building on OpenMed's cooperative agreements between partner universities in sharing practices and resources, a recent focus Saida initiated with myself and colleagues at Coventry has been on raising the awareness of and confidence in qualitative research practices (especially master's and doctoral students' as the next generation of academics and researchers). Importantly, in understanding more personalized perspectives from students and faculty about ANNU teaching and learning practices, together we have sought to understand each other's contexts, current priorities, and future goals, and adapted our project work accordingly.

We adopted an Action Research methodology for our South-North qualitative teacher–researcher development as a social practice and used cycles of interpretation and negotiation (rather than a focus on top-down research quality enhancement). As Action Research involves deconstructing, interrogation, and de-centring through cycles of planning, acting, observing, and reflecting (Carr & Kemmis, 1986), during our workshops opportunities, and online meetings, we have questioned and re-examined Western researcher–development practices between our two institutions to establish a process of joint, intercultural meaning-making, and knowledge production.

Alongside the values as participants of holding ourselves accountable, our Action Research process also sought to develop ourselves as South-North teacher–researcher–participants, not only as active practitioners in the field but also reflective professionals (see Kember et al., 2019). The outcome being that as South-North teacher–researcher–participants, we would 'own' a clearer rationale for our practices, based upon our own professional observations, deliberations, and experiences, as an embedded process. Time was also devoted in the workshops to writing for publication, with my colleague in GLEA, Dr Dimitar Angelov, joining as a UK Academic Writing Expert, also committed to Action Research as a Global South-North learning partnership.

The desire to learn together and improve stimulated both facilitators and participants to go beyond their pre-conceived and often culturally determined ideas about research and academic staff development practices. While we navigated challenges in language and translation of concepts at times, the cross-pollination of perspectives and experiences was very powerful, and the success of the program was undoubtedly due to the unflagging motivation of everybody involved. A research paper (Affouneh et al., 2021), detailing our Global South-North learning partnership, is in preparation, and we look forward to continuing our collaborative efforts, especially with regard to working with colleagues in the Research and Writing Support Unit at ANNU that has come together as a result of our program.

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Foreword by Prof. Ahmed Tlili

The Arab region has suffered both economically and financially compared to the rest of the world, resulting in low level of literacy and adoption of new education systems and methods that might improve learning experiences and outcomes. Therefore, several Arab universities have started adapting and making use of new learning approaches, such as the use of Open Educational Resources (OER) and Open Educational Practices (OEP), to ensure inclusive and sustainable education, especially in crises.

In this context, this book presents 16 innovative case studies compiled from An-Najah University, a world-class and leading university in Palestine, about enhancing learning and teaching in higher education in Palestine. These case studies focus on four important research topics, namely (1) teachers' competency and how it can be enhanced in schools, online environments or using OER; (2) pedagogy and instructional design which discuss new and engaging learning strategies that teachers can adopt in their teaching practices for better learning experiences; (3) application of educational technology, such as the use of flipped classrooms, creative drama, and educational games, to enhance learning experience and outcome; and (4) COVID-19 pandemic and the challenges faced while teaching or learning.

The unique feature of this book is that it is based on case studies which provide authentic and practical findings about teaching and learning in Palestine. Additionally, this book provides valuable and timely insights which could be beneficial to different stakeholders (educators, policy makers, learners, etc.) for advancing Open

and Distance Learning (ODL) not only in Palestine, but also in the Arab region, as limited resources exist in this context. The book could also be a good reference for other Arab universities that aim to apply similar learning approaches in their contexts.

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Preface: Higher Education in Palestine

Palestine lies at the heart of the world and has suffered more than 70 years of occupation and conflict. Its education system has been negatively affected by these conditions, despite the fact that Palestinians value their education and consider it as the only tool for resistance, liberation, and a better life. Due to movement restrictions that the Israeli army placed on Palestinians, students were prevented from studying outside Palestine.

Long years of closure forced communities to open local universities in each city in order to meet the needs of a growing number of students. Now, there are 51 higher education institutions in Palestine: 16 of them are traditional universities, 2 of them are open education universities, and the rest are technical colleges. More than 57,112 students enrolled in these HEIs for the 2020–2021 academic year where 60% of the students are female. These HEIs employ around 17,048 faculty members and employees, distributed between academic and administrative staff.

The higher education sector faces many challenges due to the lack of funding, lack of effective governance, and difficult political situations. All of these factors impact the quality of programs and the competencies of graduates; they do not, however, affect the spirit of employees and managers, who continue working to overcome these challenges, improve their academic status in different ways, and be able to contribute to international scholar communities.

The Ministry of Higher Education and Scientific Research (MOHE) was established after the OSLO agreement in 1996. It is responsible for legislation, governance practices, and quality assurance of higher education institutions. Its vision is to provide excellent higher education to all, in accordance with labor market requirements and global developments in education.

The main targets of the ministry are to (a) strengthen the capacity of the Student Loan Fund by raising the amount allocated for lending; (b) raise the grand total rate in higher education from 50 to 55%; (c) reduce the budget deficit of public universities by 30%; (d) enhance e-learning and distance learning; (e) approve the higher education endowment system; and (f) adopt the e-learning system.

MOHE has the challenge of improving research and connecting it to economic and social needs in order to enhance best practices. The culture of conducting research

needs to be reformed, and an incentive system needs to be developed in order to encourage active researchers.

One of the largest universities in Palestine is An-Najah National University (ANNU), which was established as a school in 1918 and became a university in 1978. ANNU ranks first in Palestine in many ranking systems, such as QS, and is now one of top 500 universities in the world. ANNU offers 191 programs, 79 of which are postgraduate programs. Nearly, 24,000 students, 65% of whom are female, are enrolled in the university. ANNU has around 1400 employees.

ANNU has developed its policies and incentives system in order to empower research among faculties and centers. ANNU publishes 30% of the research produced in Palestine. Its researchers publish around 400 papers each year in prestigious journals. ANNU celebrates excellent researchers and awards them annually.

During the COVID-19 pandemic, the whole education system moved online. Most universities have faced many challenges during the pandemic and have worked hard to find ways to sustain their educational processes. ANNU has been able to offer students a rich experience, since it was prepared for this shift to online learning. The university had already established an eLearning center, where part of its mission is to build the capacity of faculty members and to share open online courses before the pandemic. Many best practices in online learning have been documented, shared, and published through conferences, seminars, webinars, and journal articles.

The higher education system looks forward to the establishment of a national policy for e-learning by the Ministry of Higher Education. It is expected that this policy will open future opportunities for joint programs and international collaborations.

This book compiles a selected number of scientific outputs from ANNU's faculty members and Ph.D. students. They all show a great commitment to research and to the university.

There is no doubt that, thanks to these passionate researchers, education will continue to play a vital role in Palestinians' lives and improve their economy and their future.

Nablus, Palestine   Prof. Saida Affouneh
Madrid, Spain   Prof. Daniel Burgos

Contents

Chapter 1
Flipped Classroom Methodology to Support Students' Learning During COVID-19 Crisis

A. Reham Salhab, R. Neale Mater, and A. Najjar Eman

Abstract Teaching online against the backdrop of the COVID-19 pandemic required flexible and innovative approaches to foster learning properly. Implementing flipped learning methodology in online instruction helps students to sustain their learning and remain engaged and motivated while learning. In this study, we described how FL methodology can support students' learning. We conducted a qualitative approach through three different tools: reviewing the literature on FL in 2020 during COVID-19 pandemic, conducting a focus group of 10 school teachers with different teaching disciplines, and semi-structured interviews with 4 school teachers. We found that FL methodology supports learning in many aspects like promoting interaction, engagement, supporting them emotionally, socially, and cognitively. Some challenges were found like technical issues that needed to be addressed and taken care of. This study suggested a novel model based on the findings of this study that could benefit the teachers who implement online FL to support students' learning. We do recommend future research should also employ controlled studies that investigate the learning analytics of instructional materials that are delivered to students to assure engagement and interactions using online FL.

Keywords COVID-19 · Flipped learning (FL) · Engagement · Interaction

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1.1　Introduction

Education is in a continuous process of transformation and adaptation to a new knowledge producers' generation. Nowadays, students' role has changed to be the protagonist of their own learning process (Wu et al., 2020). More digital tools and resources are being integrated into the curriculum, even content has changed; new required skills are also required to challenge this new revolution in the teaching–learning process (Kim et al., 2016).

With the rapid spread of COVID-19 pandemic worldwide, educational institutions have decided to transit to an online paradigm for providing educational services and to communicate with students through using emerging technologies (Huang et al., 2020; Weinhandl et al., 2020). In the Palestinian context, there was a demand for more resourcefulness and creativity in teaching and delivery of information online for students during the pandemic. Flipped Learning (FL) methodology was one of the blended learning models that was used in transferring learning content as it makes learning active, effective, and assures learner's positivity by engaging the learner and the collaboration it offers (Rahman et al., 2020; Singh, 2020). FL methodology implements educational activities by applying knowledge via communicating with peers and assessing desired learning outcomes (Arslan, 2020). In FL methodology, the instructor prepares an instructional material that explains new concepts using audiovisual, textual technologies, simulation software, and interactive assessment that is accessible to students before the lesson, and available to them over time (Marshall & Kostka, 2020). Learners in general, and medium-performers who need more time in particular, and those with special needs will also be able to review the interactive contents several times at their own pace to assimilate new concepts and knowledge (Ng & Lam, 2020). Learners will be more curious and motivated; learner's formative experiences will go beyond memorization and reproduction of the learning contents (Guraya, 2020). Pedagogical strategies must satisfy learner needs by incorporating innovations linked to active methodologies (flipped classroom, gamification, etc.). These strategies foster curiosity and creativity by making students active protagonists of their learning (Marshall & Kostka, 2020).

In this article, we draw from both theoretical and practical perspectives on online FL methodology to describe how FL seeks to support learning and propose a model that allows teachers to foster this methodology in online settings to promote online FL in Palestinian educational institutions.

Social constructivism theory has been used as a framework for this study as it offers a great insight based on how FL promotes student-centered learning in order to build knowledge and socially interact with their teacher and their peers (Vygotsky, 1962). Application of social constructivism principles to FL focuses on active learning and problem-based learning theories (Kim et al., 2016).

1.2 Research Problem

Due to the challenging situation and the limited opening of educational institutions during COVID-19 in 2020, schools needed to find a solution to proceed with the teaching learning process (Huang et al., 2020). In the Palestinian context, teachers have to adapt educational strategies to fit students' needs. FL methodology helps students understand the lesson before class time, whether through links to websites or instructional videos explaining the new concepts in the lesson. Even though an increased number of empirical studies have implemented FL methodology, there is still no adequate theoretical framework for guiding the design and implementation of online FL to support many different aspects of student learning (Torrau, 2020). Furthermore, few such studies (Erbil & Ayfer, 2020; Lo & Hew, 2020; Strelan et al., 2020) have been conducted in school contexts, and the effects of online FL have not been adequately compared with those of traditional flipped classrooms.

So, the main objectives of this study are to investigate how the FL methodology supports student learning during the COVID-19 pandemic period, and to suggest a model showing how the FL methodology supports students' learning.

1.2.1 Research Questions

1. How does the FL methodology support student learning during the COVID-19 period?
2. What is the appropriate model showing how the FL methodology supports students' learning during the COVID-19 period?

1.3 Literature Review

Flipped Learning Methodology

A fundamental premise of FL is the interaction between the learner and the digital online content (Francis et al., 2020; Kim et al., 2016; Lomberadine et al., 2018). As a learning methodology and a pedagogical strategy in the educational system, it involves active learning by the delivery of learning content before the class starts and the students interact with this content (Colomo-Magañ et al., 2020). The innovative factor of FL is based on the systematic delivery of information that is characterized by organizing, sequencing, and activating student's role; traditionally, students passively learn during class time that exposes them to the theoretical contents by their own (Weinhandl et al., 2020); the resources and instructional materials are provided about the contents that students must work on asynchronously before the session starts. Dooley and Makasis (2020) showed that students interact with learning materials

and this was reflected by their academic outcomes that were assessed by learning analytic assessment.

An acronym, F-L-I-P, was developed by the FL Network in 2014 to describe the four fundamental pillars of FL methodology (Marshall & Kostaka, 2020). The first pillar is "Flexible Environment" refers to how and where students engage in learning; students have more ownership in terms of where and how they learn (Voss & Kostka, 2019). The second pillar "Learning Culture" highlights the shift to student-centered instruction from teacher-centered instruction that emphasizes the necessity of active learning (Lombardini et al., 2018). The third and the fourth pillars are "Intentional Content and Professional Educator", they center on the teachers' role in facilitating learning and tailoring relevant content to support learning online; teacher's role is to create a flexible learning environment, assess students' learning, and share ideas, and reflect on their learning with their peers (Rahman et al., 2020). Voss and Kostka (2019) noted that all of the four pillars are critical for guiding the implementation of FL, they also showed that it is a valuable approach for many subjects like English language learners particularly, as it helps teachers provide more opportunities for interaction and addresses the challenge of having mixed proficiency levels within a class (Marshall & Kostka, 2020). The FL methodology has been implemented in various disciplines, such as Mathematics, Biochemistry, Nursing, Medicine, Physics, Engineering, and Chemistry (Erbil & Ayfer, 2020; Dooley & Makasis, 2020; Marshall & Kostka, 2020; Tang et al., 2020). Francis et al. (2020) conducted research in a 1-year study period to assess the efficiency of FL by evaluating student performance and perception toward FL in core biochemical calculations by first-year undergraduate biochemistry and genetics students. It was shown that it improves students' perception by the summative assessment; these results supported implementing this learning methodology as it offers some advantages over more traditional teaching pedagogies. Marshall and Kostka (2020) introduced the Synchronous Online Flipped Learning Approach (SOFLA) that included the asynchronous and synchronous pedagogical elements in FL approach; they suggested SOFLA as a new normal role of technology in education as it offers a robust option for online instruction. Moreover, FL enhances students' cognitive engagement and it outperforms other forms of online models like gamification (Lo & Hew, 2020).

New models should be designed for FL as Naw (2020) proposed a flipped classroom design in a university setting that is based on offline content, video streaming and conducted a survey from 490 students of UTYCC in designing flipped classroom and suggested the appropriate tools and techniques in applying the classroom for the common subjects of Myanmar universities. Moreover, a study conducted by Weinhandl et al. (2020) explored the appropriate design elements when implementing FL approaches in teaching Mathematics. They concluded some key elements like: teachers should be decision-makers of online learning, online learning environments should not lead to additional work for teachers, and privacy and security of online learning environments.

Through reviewing the theoretical literature of studies that dealt with FL methodology in the teaching process in 2020 academic year, especially during the COVID-19 pandemic period, we found that most teaching strategies and methodologies centered

around the FL methodology (Erbil & Ayfer, 2020; Colomo-Magaña et al., 2020, Dooley & Makasis, 2020; Fogg & Maki, 2020; Francis et al.,2020; Guraya, 2020; Lo & Hew, 2020; Marshall & Kostka, 2020; Ng & Lam, 2020; Rahman et al., 2020; Singh, 2020; Singh & Arya, 2020; Strelan et al., 2020; Tang et al., 2020; Weinhandl et al., 2020; Wu et al., 2020).

1.4 Methodology

To answer our research questions that were mentioned previously in this study, we analyzed interviews and focus group of teachers who implemented FL methodology by using qualitative directed content analysis, a method for systematically describing and analyzing the meaning of qualitative data, it starts with a theory or relevant research findings as guidance for initial codes (Hsieh & Shannon, 2005).

1.4.1 Research Setting, Participants

As mentioned above, the study is framed by social constructivism context. Teachers who implemented FL noticed how students learn by interacting with their peers online to construct and deepen knowledge and concepts, and develop positive attitudes and practices related to the use of social skills while they are learning.

The researchers conducted a focus group, which consisted of 10 teachers (9 females and 1 male), from different disciplines (Science, English, Biology, Physics, Mathematics, and Social studies), and from different governorates from Palestine (Jerusalem, Tulkarm, Jaba, Qabatiya, Hebron), and they teach different educational levels (primary, and secondary). In addition, the researchers conducted semi-structured interviews with 4 teachers from different areas in Palestine (Gaza, Ramallah, Tulkarm, Nablus), and with different majors (Elementary school, Science, Technology, and Chemistry). The educational experience of all study participants ranged between 10 and 13 years of experience.

1.4.2 Research Context

Most of the studies that carried out from the beginning of the year 2020 until the date of writing this research were collected on the topic of the FL methodology and its support for student learning during the COVID-19 period. The results of systematic review studies and their targeted group were linked to the results of the interviews and the focus group.

1.4.3   Data Collection

In this study, a systematic review, semi-structured interviews, and a focus group were used for data collection.

A systematic review, is a type of literature review seeking to identify all the available evidence on a topic to reduce the effect of bias on the review findings, it serves a huge quantity of evidence (Arslan, 2020).

By reviewing the theoretical literature of 15 studies recorded in the databases, the target group was concentrated in high school and university students, the results of these studies were focused on to obtain the most important points in which this strategy supported the student in all respects.

The focus group and interviews aim to explore the effectiveness of the FL methodology on students' learning from the teachers' perspective as they actually experience this methodology in the process of teaching their subjects. The focus group and interview questions were based on the research questions, and followed the procedures outlined by Seidman (2012). The protocols of focus group and interview were developed to guide the researchers during the interviews. It consisted of nine open-ended questions and a series of probing questions that were used to extract more in-depth responses from participants.

The participants signed a form providing consent to record the interviews and the online focus group. The focus group was conducted by using a Zoom technology, due to its convenience, ease of use, security, interactivity, unique features (e.g., video record option), and its ability to facilitate personal connections between users (Archibald et al., 2019). They lasted for an average of 100 min. During the data collection, semi-structured open-ended questions were used.

In a focus group and interview, teachers were asked the following open-ended questions:

- How does the FL methodology support student learning (social, psychological, skill, and cognitive)?
- Describe the importance of employing the FL methodology in student learning during the COVID-19 period?
- How did the FL methodology take into account students' learning styles?
- What are the difficulties students faced during their learning with the FL methodology?
- How did you help your students to overcome these difficulties?
- From your experience, how do you see the student's mastery of distance learning skills (learning through the FL)?
- How was the participation and interaction of students during his learning in this way?
- How does this methodology help acquire new skills?
- What is the effect of this strategy on students' thinking skills and their motivation toward learning?

1.4.4 Data Analysis

The research presents a content analysis study as a type of qualitative research that analyzes the FL as a methodology that promotes active learning. We are describing a situation FL methodology during COVID-19 and how it supported the students learning in many aspects from teachers' perspective. Interpreters are well qualified to interpret the results. One of the interpreters is a FL trainer who trains teachers in schools, and the second one is a principal of a school. The third interpreter is a college instructor in the educational technology department.

In the systematic reviews; the researchers reviewed the theoretical literature of 15 studies recorded in the databases, and analyzed by content analysis.

All the audio and video files were transcribed and analyzed based on Yin's (2014) procedures. Around three hours of recorded interviews and two hours of a focus group were analyzed by using content analysis; the text could be coded, or broken down, into manageable code categories for analysis (i.e., "codes"). Once the text is coded into code categories, the codes can then be further categorized into "code categories" to summarize data even further (Hsieh & Shannon, 2005).

The data was analyzed by using a thematic analysis, and second by finding the categories. The main themes were developed based on the most relevant ideas and concepts, repeated ideas and concepts from different participants in the focus group and interviews (Hsieh & Shannon, 2005).

1.4.5 Validity and Reliability

To ensure the validity and reliability of the study, the researchers discussed the themes and subthemes before approving the final themes. To ensure reliability and validity of data analysis, each researcher worked alone. Holsti's method which is a variation of percentage agreement gave a percentage of agreement of 0.90 which is a good score for qualitative research (Wang, 2011).

1.5 Findings

By conducting a triangulation analysis between the data sources—systematic reviews of studies, semi-structured interviews, and the focus group—the researchers found that teachers have various perceptions toward the online FL methodology and how it supports student learning during the COVID-19 period. These perceptions are based on their experience, knowledge, and skills, as reported in the interviews and the focus group.

To answer the first research question, a systematic review of studies was conducted; content analysis of these synthesized the following categories like:

1. **Improvement in students' communication skills**:

    Where students got better engagement and more specifically cognitive engagement through students' peer interaction, teacher interaction within the classroom that causes a more active role in the learning and more engagement in the learning progress.

2. **Students' awareness of their learning process**:

    Their attitudes toward peers, teacher, environment, and learning process were positive. FL is a great approach to be applied in the classroom, it improved students' learning, and it was beneficial regardless of discipline. This awareness led to self-regulation learning and promotion of autonomous learning, and developed interpersonal skills.

3. **Challenges that students faced during their learning with the FL**

• **Technical problems**: the most important of which are poor internet connectivity, inferior technical know-how of the online tools, excessive workload for students, material preparation is time-consuming which creates workload for teachers, and requires adjustment period.

• **Students' assessment**: while using the FL It should be done carefully to ensure that students will achieve the learning objectives by collaborative assessments, so they give small tasks with a rubric, observing students' performance in specific skills, student self-evaluation, peer evaluation, and the teacher evaluation.

The following categories were found from the data analysis of the semi-structured and focus groups:

1. **Emotional, Social, and cognitive Support**

1.1   Emotional Support

    FL supported students emotionally. When asked teachers, they all affirmed that flipped classrooms helped shy students to interact virtually and overcome this problem that they face in traditional classes. A teacher mentioned that "*I was surprised how some students who never participated in a class discussion before are contributing and talking for the first time with confidence virtually*". Moreover, teachers have shown that by introducing online course concepts before class time, students become active learners and more motivated, which could function as part of autonomy support and self- regulation learning.

1.2.   Cognitive support

    Teachers noted that during online FL, students gain first exposure to new material online, usually via reading, images or lecture videos, and then use online class time to do the harder work of assimilating knowledge and concepts, perhaps through online discussion, collaborative work or debates. FL provides an opportunity for structured, active learning, problem-solving, critical thinking, enhancing students' language skills such as writing and speaking. A teacher commented that "*students were coming back after they watched the Science videos and asked curious and deep questions*".

1.3. Social Support

Another form of support in online FL is interaction among students. Interaction combines authentic input and collaboration among students during online classes in Science, Math, Geography, and English. Specifically, an English teacher mentioned that she "*poses questions or makes comments in a shared electronic version of the textbook or other reading material, which helps students highlight sections of the text that strike them and leave a comment or question*".

1.4. Teaching Support

Most of the focus group participants reported that they use various educational methods to support their students in their learning process. One of them said, "*I use many diverse methods to motivate students and support their learning, such as interactive games, participatory leadership, the young teacher, in addition to publishing pictures of their work on student groups, in addition to grading as a form of motivation*".

1.5. Differentiated learning (DL) support

FL is a tool that could be used for achieving differentiated instruction. FL helps to meet the needs of different students with varying levels and abilities. It involves offering individualized and instructional content via multiple modalities of instruction. One teacher mentioned that "*students have flexibility to study at their own pace with different formats that fit visual, auditory, and kinesthetic styles, which will help to learn effectively in my English class*".

2. Challenges

During the focus group, teachers indicated that students were unable to deal with some of the programs used in the online FL. The science teacher commented that "*seventh-grade students face difficulty in using the Microsoft Teams platform when following up on the educational material that I download or when carrying out the tasks required of them in Home*".

The primary education teacher also confirmed when conducting the interview that one of the most important difficulties she faces is the lack of Internet service in their area in Gaza. The Internet service in Palestine is a major obstacle and a challenge in the continuity of e-learning due to poor networks and poor network delivery service.

3. Evaluation

Most of the participants in the focus group emphasized that the students' evaluation process should change according to the learning strategy used. One teacher said, "*We cannot evaluate students in a behavioral manner when we use a constructive strategy with them in their learning process*".

To answer the second question, we suggest the following model based on the findings of our study (Fig. 1.1).

The previous figure shows the student's learning model during the flipped classroom methodology, the model consists of 4 basic elements: student, teacher, training, and online tools, the students are the center of the learning process as they get many support during their learning process, where their learning styles are taken into
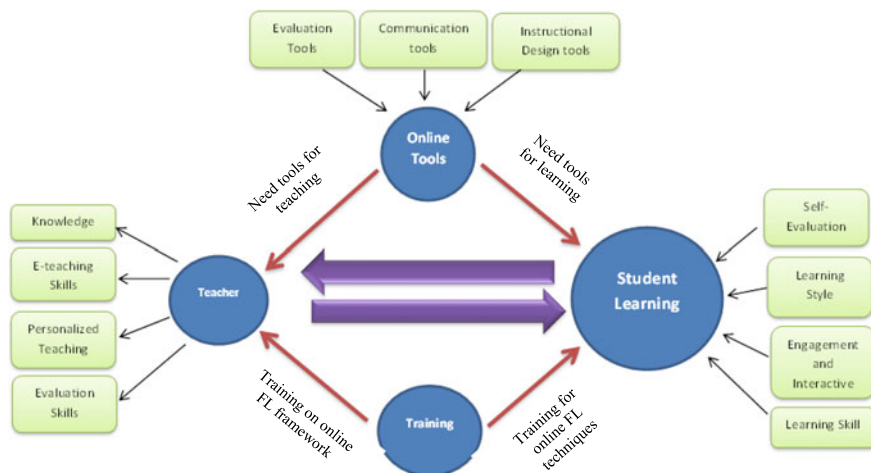
Fig. 1.1 Model of online FL methodology to support students' learning, *produced by authors*

account using ICT tools, it enables them to obtain a high degree of interaction and engagement, acquiring many learning skills, including self-learning skills, communication skills, and the ability to practice self-evaluation. Moreover, the model also shows the important role of the teacher in supporting the students, whether in guiding the student or in providing appropriate training for them.

1.6   Discussion and Conclusion

In addition, Students acquire many skills, including self-learning skills because FL is self-paced and allows students to access learning activities at their own convenience based on the flexibility of "anywhere, anytime", skills related to dealing with programs and computer applications, the use of these technological tools that gives the students positive attitudes and high motivation toward the learning process (Tang et al., 2020).The model also indicates the necessity for the learner to possess e-learning skills that help him to pursue learning using this methodology, and this is done by providing appropriate training to students by teachers.

Also, self-evaluation is one of the most critical components of support that familiarizes the students with the practice through using e-portfolio. Colomo-Magaña et al. (2020) mentioned that self-evaluation is one of the usefulness related to FL as it supports students' learning using this methodology. Therefore, the teacher who implements FL must possess knowledge, be familiar with elements and the mechanism of its application, in addition to e-teaching skills, e-evaluation skills, personalized teaching. Singh and Arya (2020) emphasized teachers must observe their learners, give feedback, and assess their work. They must also be reflective in their practice, always improve their instructions, accept criticism, and able to control

chaos in their classrooms. FL methodology is distinguished by its ability to take into account the student's learning styles, through providing and communicating with students in terms of quality content (Rahman et al., 2020; Singh & Arya, 2020; Torrau, 2020).

So, apparently the proposed model in Fig. 1, shows that teachers need online tools to design the educational content appropriate to the learning style of their students, and they need these tools in the evaluation process such as interactive worksheets, electronic tests, and others.

Therefore, it is imperative for teachers to possess e-learning skills to implement the online FL methodology effectively, teachers are not trained enough, this corresponds to the findings of Colomo-Magaña et al. (2020) and Dooley and Makasis (2020). Students need to be trained as well on the techniques that the teacher provides to them, this finding was consistent with Erbil and Ayfer (2020) who emphasized the importance of training students.

This study reveals that FL methodology supports students' learning emotionally, socially, and cognitively by creating an active learning environment. Thus, these findings encourage teachers to implement the suggested FL model with their students to support their learning.

Further studies focusing on finding solutions to reported challenges in FL are needed to be carried out. In addition to this, further research should be undertaken to investigate students' learning styles, cognitive, and metacognitive strategies they use while they are attending different disciplines.

As final remarks, FL is potentially a stepping-stone to a better learning methodology during COVID-19 with a more enriched, innovative, flexible, learner-driven environment. We do recommend future research should also employ controlled studies that investigate the learning analytics of instructional materials that are delivered to students to assure engagement and interactions using online FL. Teachers, instructional designers, curriculum designers, and trainers would benefit from online FL research.

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Chapter 2
Strategic Planning Model for Implementing and Developing OER in Education

Safia Atia Mohammad Tarteer
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Abstract This study aims to develop Open Education Resources strategic planning Model for Implementing and developing OER in the Education sectors (schools and Universities). It aims also to guide teachers and educators to use such a suitable OER to use and reuse it easily in education. A systematic literature review and SWOT analysis have been adopted to achieve the study goals. The Findings revealed that the model consists of the following sections the implementation of OER in education, including Implementation and development of using OER. The researchers recommend educators to develop open courses for different groups mainly the poor. It also recommended that Government and the Ministry of education should revise the policies that foster the access to OER by adopting OER models and frameworks.

Keywords Openness · Open education resources (OER) · Copyright · License

2.1 Introduction

Students are facing many problems in education today. These problems are ranging in different countries and places, from the lack of access to poor quality. There is a common thread in low availability of good quality educational material. Although the learning material is available but the access to it is very difficult and very high, it increases year after year. In the same time, the internet revolution has facilitated the concept of openness more (openness means to access to educational resources

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without barriers). Technology has created many chances and attracted people's attention toward sharing their knowledge (Zhao, 2012). Since education is a key factor behind sustainable development opening up education can support this agenda and open educational resources (henceforth OER) are a key element in this process. Hilton and Willy (2010) proposed six critical ways for higher education to understand the importance of openness. The six ways are from theoretical to digital, from restricted to mobile, from isolate to connect, from general to personal, from a consumer to general, and from close to open.

The idea of openness started to play very important role in driving collaboration in education and implementing the value of university based-education. It succeeded in shifting traditional education to more learner-centered approach. Many previous studies have interrupted the meaning of openness in the relation to OER; the meaning of open and openness consists of multi-dimensions that affect the employment of OER. Foote (2005) for example, defines four freedoms: freedom to copy, freedom to modify, freedom to distribute, and freedom to remix. Whereas William and Flora Hewlett Foundation (2013) pointed out that OER (open educational resources) should be residing in a public domain or have been released under an intellectual property license. OER include full courses, course materials, module, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge. Since everyone has the right to education. It shall be free at least in the early stage. Additionally, the stress of the license allows free use and repurposing, it is not enough to be free in cost, it has to be reusable, too.

In general, education is recognized a fundamental human right; everyone has the right to education. Therefore, higher Education has been using the Internet and other resources to develop teaching and learning. OER attracted the attention in its potential toward promoting lifelong learning. In fact, the increase of the appearance of OER provides more opportunities in teaching and learning and started to overcome educational challenges (Atkins et al., 2007). Since openness is the breath of life for education and research. Resources created by educators should be open for anyone to use and reuse.

On the other hand, UNESCO (2007) introduced the right to education in three areas: the right to access to education, the right to quality education, and the right to respect within the surrounding environment. In spite of the availability of OER, Burgos et al., (2007) added that resources could be open but not free to use. Besides, educators and learners don't implement them in a right way. They even don't know what OER, its' benefit in enhancing knowledge, and they don't know what is license, copywriter or even the use, reuse, and share knowledge from others. Additionally,

they don't aware of ICT skills. In responding to this gap in knowledge, the researchers conducted this study. This study came to shed light on the meaning of openness, its benefits, and types of OER. Above all it came to draw the right way to the educators to implement and develop the use of OER to enhance education through creating a strategic planning model to implement and develop OER in education.

2.2   Question of This Study

How to implement and develop OER in education?

2.3   Purpose of the Study

Open Education leads to self-education. This study aimed to develop strategic planning process model for implementing and developing OER in Education. This model will help to guide educators to use OER, it will also help schools and universities to guide their vision, values, goals, and strategies to implement and develop OER.

2.4   General Overview About OER

2.4.1   Definition of OER

There are many definitions for OER, UNESCO (2017) revealed that OER are many kinds of material used in education, which is in the public or introduced with an open license. They are open material and can be freely copied, adopted, used, remixed, and even re-shared. Using OER specially the digital ones seems to be more easily, it may include content maps, videos, multimedia, and application, prod cast and any other material which use for teaching and learning. OER Commons defined OER as an open educational resources that are teaching and learning materials that are freely use and reuse, adopted and shared without charge. Besides, United Nations (2017) defined OER as teaching, leaning, and research material in any medium—digital or otherwise that resides in public domain or has been written under open license without cost or use by others without restrictions. Finally, OECD (2007) defined OER as a digital material offered freely and openly for educators and students and self-learners to use and reuse for learning and research. The researchers think that all OER definitions participate in almost the same elements as the Table 2.1 shows.

The researchers think that OER are digital and non-digital materials which designed to be used by learners and educators. It includes content and tools, freely shared through open licenses which facilitate using and sharing by anyone.

Table 2.1 Identifies common elements and some differences across the definitions

	Open copy right license required	Right of access, adaption, and republication	Non-discriminatory (i.e., rights given to everyone, everywhere)	Does not limit use or form (this does not include non-commercial limitations)
Hewlett foundation	✓	✓	✓	✓
OECD		✓	✓	
UNESCO	✓	✓	✓	✓
Cape Town declaration	✓	✓	✓	
Wikipedia	✓	✓	✓	✓
OER commons		✓	✓	✓

Source (creative common, 2015)

OER has a past history; it challenges traditional education in many ways. In 1999 some Universities in Germany and the UK released some educational resources for free. OER became widely known in the USA in 2001, by 2002 it had released 32 courses with open license. UNESCO (2002) conducted a conference about the Impact of Open Courseware for Higher Education in developing countries. Since then, many education services opened their license and the internet to share teaching and learning resources. Besides, the Cape Town Open Education Declaration (2008) and the Paris OER Declaration (2012) provided guidelines for governments to release educational resources with open license. In some countries such as The USA, the UK, and South Africa succeeded in integrating OER into national policy. In 2014 The National Mission of Education through ICT in India adopted an open license for all of their outputs, releasing of OER all content generated with its funding. Stanford University in 2010 offered a massive open online course (MOOC) leading hundreds of learners for free courses. It developed and knows, it provides its services via MOOC platforms supporting very large number of students (Kernohan & Thomas, 2012). It is a clear example of the power of openness to increasing OER access to all. MOOCs, open educational resources provide a low cost or zero cost to access a good quality of education. The service comes from government, non-government, and foundations. Collins dictionary defines a MOOC, as a free online course that many people can study. MOOCs are free to access but they didn't adopt an open license. MOOCs presence has created a dialogue to access to education in digital age (Pickard, 2018).
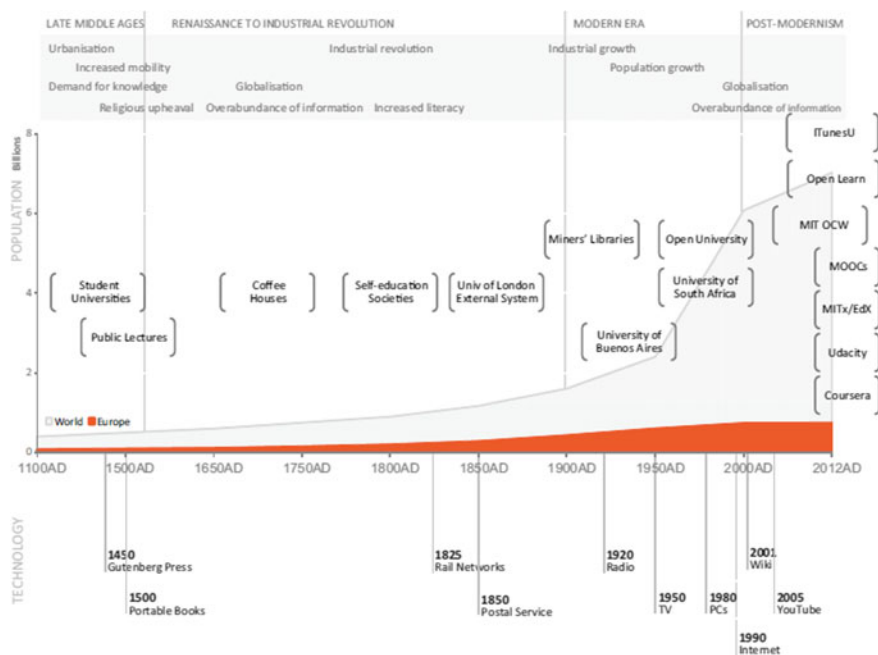
Grid (1) shows the history of OER in education (Diemann, 2014).

Benefits of OER; there are many benefits for OER in teaching and learning, these material that are available either in the public domain or under an open license; allowing access to huge amount of data and to the quality content. It is open to anyone, available, free; not bound geographically, students can try the course before signing in, flexible study times not bound by calendar, and students can work with their own pace. This open environment is important in making open education possible (understanding open educational resources (Kaosaiyapron, 2015)). Additionally, there are potential benefits of OER include: Government perspective such as unlocking the knowledge for benefits of all and promoting lifelong learning. Then, Institutional perspective such as sharing knowledge with others and helping the learners to find the right program. Next, Educator's perspective: Fostering connections with others and allowing others to build on them leave a legacy after existing academia. Finally, learner's perspective: OER can promote informal learning; students can access and get the knowledge from the best university in the world. OER challenge the high cost of textbooks by reaching to the affordable resources (Understanding Open Educational Resources, 2015).

There are more potential benefits for OER to monition: It improves learner's satisfaction, it widens the participation in teaching and learning, using different material, leads to critical reflections by educators, brings financial benefits for students and the staff, and it encourages institutions to change their policies (Open education resources, 2014).

Besides to the types of OER; OER can be divided into many types as it be needed in educational sectors such as lesson plans, work sheets, lesson resources, references, and articles, creative common provided the following types: Digital learning objects, Digitized object libraries, OER encyclopedia, Open Online archive, Open textbook, OER courseware, OER courses, and Online tools that support the open community. Other organizations pointed out that OER can be divided into four groups: text-led, video-led, animation- led, and multiple media. Types of OER include: full courses, lectures, games course material, open textbooks, and learning objects (open education resources, 2014).

There are many institutions help to promote OER in education around the world, to mention: The William and Flora Foundation: The co-founders were Hewlett and his wife; they have a wide range of interest in the internet and they invested too much in education. In particular, in supporting Open Educational Movement. Hewlett and his wife supported many conferences about OER such as the conference which was hold by UNESCO (2002), and the Commonwealth of learning (COL) conference. In addition, the couples supported many school with suitable curricula, guidelines, and tools for the field of OER, provided policies for policymakers to advance the access to OER, and developed innovative OER models.

In addition to UNESCO: The United Nations Educational, Scientific and Cultural Organization (UNESCO20) believes that OER "provides a strategic opportunity to enhance the quality of education as well as improve policy dialogue, sharing knowledge, and capacity building". The Paris of OER declaration, adopted during the World OER congress held in June 2012 was a very important step toward the national supporting of OER policies. The declaration encourages the governments to adopt and encourage to the use of national policies supporting OER. In 2013 UNESCO adopted an open license for its publications to promote OER and OA.

It is important to talk about the use of OER, so creative common license indicates three different ways, these techniques are referred to reuse, revise, and remix as Poposki (2010) pointed out:

First, reuse: To reuse the reference without changing it, an OER suits all evaluation criteria identified, it can be applied to the learning environment. The only requirement is to use the source as required by open license.

Next, revise: OER need to be modified to suit the learning environment to be understood by the local learners. The OER can be also translating into different languages. Besides, OER can benefit from enhancement such as additional questions, and peer discussion. Many OER do revision, but it is important to review the personal selection of OER and make sure that the permission is granted.

Then, remix: Remixing is a process putting the numbers of OER into new learning resources. Remixing enables the user to use multiple OER. The structure of the course material has multiple resources that used to adopt new Product. Not all combinations include by an open license allows all OER to be joined (Poposki, 2010).
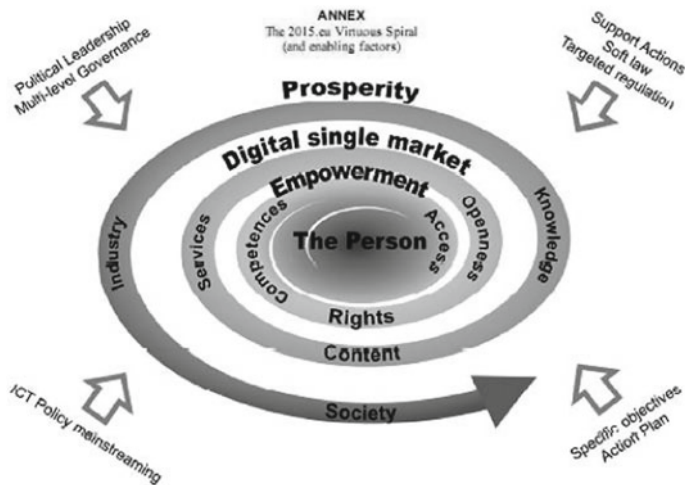
Grid (2) shows the access to OER after collaboration between education sector and government (Poposki, 2010).

Finally, Quality Assurance of OER: Assurance the quality of OER material is recommended before releasing to the public's good course need to assure quality in terms of: Content; knowledge, and skill. Then, pedagogy, teaching and learning methods. Next, Motivational strategies; intrinsic and extrinsic rewards for students. In addition to the Degree of students' autonomy. Besides, Access to the learning environment including cost and technology. Finally, management strategies. In fact, employing OER requires special attention (Understanding Open Educational Resources, 2015).
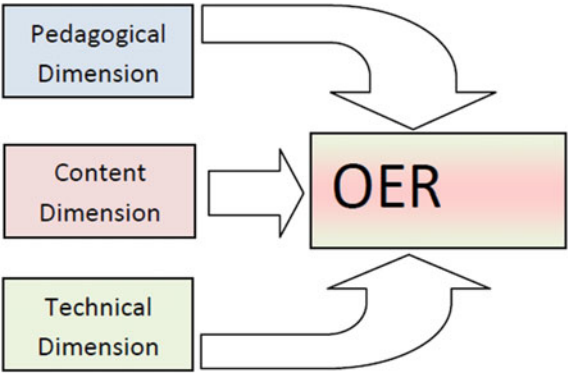
Grid (3) represents pedagogy, content, and technical dimensions (Almendro et al., 2018).

2.4.2   Challenges

Although the benefits of OER in teaching and learning, the users of it facing many challenges to mention: Appropriate source of OER they are scattered in the internet. Then, Understanding open license, the familiarity of using the open license. Besides, the adoption of OER requires new skills such as ICT skills and skills to adopt and repurpose. In addition, there are people feel that it is not suitable to use others work rather than share and use it as resources in their studies. Sometime the availability of internet affects the access for OER. Finally, schools and universities don't reset new materials to others to benefit. According to Wiley (2006) the sustainability is a challenge. It comes in two types; the sustainability of produce and share of OER. Most of the staff in educational institutions lack of the ICT skill and the familiarity of OER which cause a real problem to access to the OER. Besides, the lack in familiarity in copywriter issue. They don't aware of the ownership of the recourse. This doesn't let educators to get content and share it with the community. Above all, finding more relevant resources with the best quality because the rapid in learning material is another challenge.

In fact, there are other potential challenges facing the use of OER that is Technical issues such as metadata standards. Additionally, Economic issues such as the difficulties in covering costs or sustaining an OER project in the long run. Then, Social Issues; the absence of technical skills and assuring quality in open content. Above all, the lack of awareness between academics regarding copyright issues. Besides. Cost is considered one of OER barriers; the cost of textbooks impacts the school sector, in Cameron for example 12 graders sharing the same text book (Kanwar, 2018).

2.5   Research Methodology

A systematic literature review has been discussed in many papers (Bandara et al., 2011; Khan et al., 2003). This study tried to answer the following question:

- How to implement and develop OER in education?

To answer the above question, the researchers revised the literature review including (Kaosaiyaporn et al., 2015; Shu-Hasing et al., 2015) documents about developing Model for OER. So that the researchers developed a strategic planning model for implementing and developing OER in Education. They developed their own model based on the plans in the previous literature contains the following sections (implementing OER in education, includes; envisioning, availability, capacity, awareness, permission, access) and (developing the use of OER in education includes; engagement, empowerment, participating, usability, sustainability, evaluation).

2.6 Strategic Planning Process Model

1. **Plan Proposal Components**
2. **This section contains the following components after revising papers about OER:**

Phase one: Analyzing the related documents that talks about implementing OER in education includes (OER definition and benefits, types, content development, access, copyright, license, future trends, and challenges) (Kaosaiyapron et al., 2015; London & Morfopolos, 2010), see Model (1). **Phase two**: SWOT analysis or (gap) analysis includes strength, weakness, opportunities, and threats of implementing OER in education. This will be achieved after revising some documents about OER (examining the needs and gaps) (Table 2.2).

Phase three: Developing strategic planning process model for implementing and developing OER in Education includes schools and universities. **Phase four**: Submitting Establishing strategic planning process model to two university experts in ICT and OER, then to the three higher studies students (3 PHD candidates who took a complete course in OER) to review it and give their notes to develop the model. Experts are professors in local and international universities, they teach course in

Table 2.2 SWOT analysis

Strength	Weakness
• Ability to share knowledge to others • The idea of openness • Four freedoms (to copy, modify, distribute, remix) • The diversity of open education resources courses, study materials, units of study, textbooks, video streams, tests, and software will be used to support access to and dissemination of knowledge • Higher quality learning resources • Lower costs of resources to compulsory sector such as open texts	• Lack of access to OER • Internet availability • Not open for everyone • Educator's wrong implementation • Don't aware of copywriter • Gap in implementation • Educators lack of ICT skills • There are no formal policies by many educational institutions to encourage the use of OER • Insufficient awareness of the importance of open educational resources and their participation, in addition to its sponsorship and promotion
Opportunities	Threats
• The availability of learning material • Internet revolution • Technology facilitate gaining knowledge • Previous OER models to benefit from • Adopting OER model to benefit from resources • Making OER more reliable and authentic	• Changes in the global world • Poor quality • Not all OER are free • The stress of license • High cost • Weakness of international policy • Increased focus on open textbooks has led to neglect of OER for lifelong learning • Difficulties in covering costs or sustaining an OER project in the long run

OER, but the PHD candidates are from local universities, they read and conduct articles about OER so they know about it.

2.6.1 Implementing OER in Education via

After revising previous papers about OER as Shu et al. (2015) shows, the researchers adopted the following steps in designing their own OER as follows:

First step, envisioning: Includes the lack of some educators knowledge how to use and implement OER. They also don't have their own knowledge how to develop OER. Their challenges may be as a risky on the learning process. It will not meet the purpose of the surrounding environment (Jelgerhuis & Hester, 2014). Envisioning should contain the core vision, values, and mission of the institution and their relation to the OER.

Second step, availability: Through expanding knowledge, Vision, Mission, goals, objectives, to assure the sustainable development in education because OER will become a philosophy in the near future. OER may solve the challenges in education if the ministry of education and institutions take their responsibility toward taking and creating OER.

Then, capacity: Developing human capacity through teaching, building, and creating knowledge through researches. Use and reuse others' work. Next, **awareness**: The learners engage themselves toward greater awareness of OER and its benefits, and learners and educators should be aware of the social needs from the surrounding environment. This needs timeline, participation, communication, and accountability.

In addition to the **permission**: Copy right law gives the author the right to use, reuse, and share resources. There are also open resources that anyone can use and reuse. Educators should be aware of this law and let others know about it to benefit from other's work to have a good quality of education. Besides, each one has the opportunity to learn.

Finally, **access**: via open license or creative common license enables the free distribution of the copyright wants and used when any author wants to give any researcher the right to share. Then it needs good quality of internet and speed. Websites should be usable and possible especially for those who use mobile or with slow network connections. Additionally, people with disabilities should be able to use OER. This includes delivering content to more than one by text, speech or video. It should be designed in a way everyone can use it without bother (Shu, 2015).

2.6.2 Developing OER in Education

OER in education can be shown as Shu (2015) revealed, the researchers adopted the following steps:

Above all, engagement: Basic elements of associations between school teachers, learners, and university educators. Users find it pleasant to use and appropriate for its industry. **Then, empowerment**: Interconnections boundaries between content, experience, and knowledge. Finding courseware to enable learners to gain knowledge independently but under the content of copyright but the author allows using as open license. **Besides, participation**: includes encouraging participation between educators from two cultures and different places. New users can accomplish goals, easily and even easily on future visit. Next, **usability**: including using, reusing, and sharing content resources to develop and deliver tools resources after SWOT analysis. The material should be open license and free to share; it should also be developed in public and collaborative manner. The tools should be website, pictures, video, digital, and non-digital tools. **Sustainable**: includes implementation resources; scope of content, content development, implementation and quality assurance. Implementing such a plan and receiving feedback enable administrators and educators to put their long-term strategic vision. **Finally, evaluation**: shall be done by measurement model of OER system function in cultural awareness on the school and university students in terms of participation knowledge. In addition to the outcome evaluation and self-evaluation; evaluating the previous steps to check if the mission and the vision came together and receiving feedback from experts to create improvement (Paris, 2003).
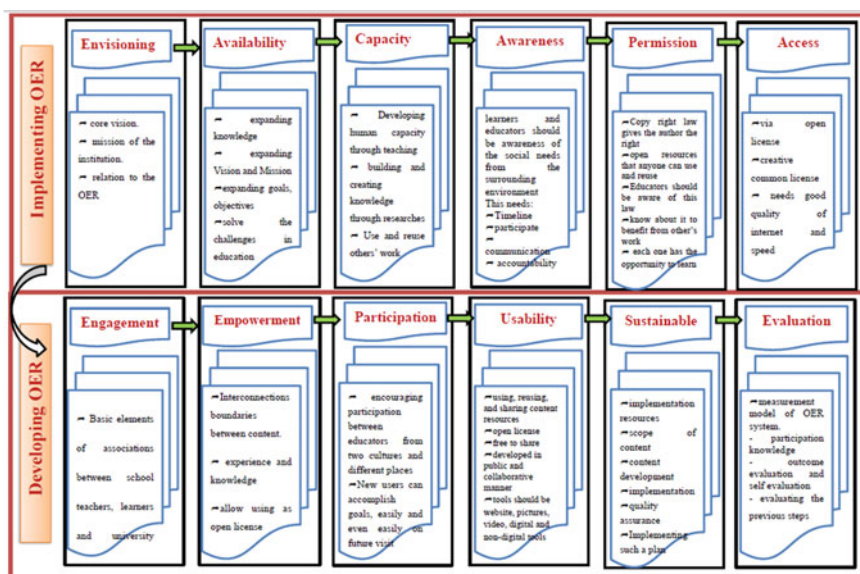
Model (1) the planning model for implementing and developing OER in education, developed by the researchers.

2.7   Conclusion and Discussion

The internet era has changed in the structure of Educational Institutions. It affected the way of sharing knowledge. Knowledge has been increased in today's globalized world. The desire to access to the libraries, to the major research and to the government data became from nowadays demands. The researchers in this research tried to fill the research gap which is the familiarity with OER and its using skills, the access to OER, and benefit from it. They revised previous literature and found that most of educational staff don't aware of OER and they don't know how to use it to enhance the process of teaching and learning and get a good knowledge to suit the demands of today's globalized world. They don't aware of the issue of license and copywriter, too. Thus, the researchers put their model to facilitate a suitable access to OER freely or at least with low cost. The results of this research revealed a model contains two main dimensions to implement and develop OER in education. The researchers focused on the ways of access, evaluate, usability, sustainable, share, reuse to attract the educators' attention toward the use of OER. They also supplied educational staff, stakeholders, and the government with general overview about OER to help the reader to recognize what is OER and its great benefits in education (schools and universities). Based on the results of this research and the revise of literature review, the researchers recommended the following: First, Stake holders and educators should adopt OER models to benefit from, keep reviewing them to promote teaching and learning, and to increase the reach to OER resources. Second, The Ministry of Education and Higher Education Institution should take their responsibility to provide quality teaching and learning as a core mission to contribute in society development. Third, Researchers should create a model for developing ethics and creative of the use of OER. Fourth, Researchers should create a model of use OER for disabled people include videos, pictures, and audio. Fifth, reducing the cost and increasing the access to different resources. Then Stakeholders should increase the quality of education by the awareness of the OER. Besides, Government and educators should revise local policies that foster the access to OER. Next, Encourage educators to participate in OER movements. Finally, OER should be used freely via open license.

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Chapter 3
The Effect of Using Games in Teaching on Students' Achievement and Motivation

Saddam Riad Kobari, Shaheen Jamal Shayeb, and Iman Kamal Dawood

Abstract The current study aims to explore the effect of using games in teaching on students' achievement and motivation. The researchers analyzed previous literature review, and they found that the majority of the studies indicated that games have good positive effect on students' achievement. Besides, the studies also showed that games have positive effects on students' motivation. The researchers also suggest that the teacher should take into consideration the characteristics of effective games. The researchers also recommend teachers to follow the steps of using games inside the classroom since they direct teachers to let the game create positive effects. The researchers also recommend other researchers to conduct more studies on the best ways of using games in the classroom since there is a lack of studies in this domain.

Keywords Games and achievement · Games and motivation · Using Games

3.1   Introduction

One of the most challenges that face teachers and educators these days is engaging diverse groups of students. That is, many students are from different backgrounds, and they have different learning experience with various degrees of commitment, motivation, learning styles and ability. Azriel et al. (2005) said: "regardless of age or economic, ethnic, or social background, people understand the language of play". Ahmed and Wias (2012) investigated the reasons of the low level of students' academic achievement among high schools' students form the students and teachers' perspectives. The study showed that there are many reasons that negatively affect students' achievement such as low motivation, lack of attention and the existence of distractions. The study recommended that teachers should attract students' attention by games and other educational methods to increase their motivation. Hence, they will learn better and achieve better.

Corno and Snow (1986) found that the best way to educate a diverse group of learners is responding to their needs, and games can satisfy students' needs through

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different styles and approaches. Shatz and Loschiavo (2005) said that games promote lightening the mood, and foster creativity and interest. Moreover, Wycoff and Pryor (2003) stated that the process of lightening the mood fosters communication that creates effective learning environment. Wycoff and Pryor added that games can create "want" to learn environment that motivates students to play their roles; hence, the students will be attracted to join the enjoying atmosphere leading to deep and interactive learning. In addition, Shanahan et al. (2006) indicated that games provide sufficient feedback for teachers and guidance for students which can enable teachers to find the gaps and hardships in learning.Therefore, they can solve them easily. Hence, this study aims to explore the effect of using games on students' achievement and motivation. Besides, it aims to provide guidelines that inform teachers how to use games in their classroom effectively.

Research Questions

(1)   What is the effect of using games in teaching on students' achievement?
(2)   What is the effect of using games in teaching on students' motivation?

3.2   Literature Review

3.2.1   *Games*

Hadfield (2002) defined games as "an activity with rules, a goal and an element of fun". Besides, Deesri (2002) defined games as "a form of play governed by rules. They should be enjoying and fun". Thus, we can say that games contain several factors such as competition, rules, participant/s, relaxation and specific context. Hence, they ease the process of active learning and enjoying atmosphere. According to Hadfield (2002) games are divided into two kinds: competitive games, in which players seek to be the first to reach the goal, and co-operative games, in which players work together toward a common goal.

Games are effective educational strategies that create a communicative learning atmosphere. Besides, they foster problem-solving skills and strengthen students' engagement and involvement. Hence, students will be fully motivated during the process of learning (Harb, 2007). Hadfield (2002) stated that games are divided into two types. First, competitive games. They give the opportunity to play and compete in order to be the first person who reaches the goal. Second, co-operative games. They give the opportunity to the players to work together toward the mutual goal.

Yu (2005) indicated that games should have the following characteristics. First, they should be interesting and fun. Second, they should be rule-governed. Third, they should be competitive. Fourth, they should be goal defined. Fifth, they should be engaging. Sixth, they should have a closure (Yu, 2005). Yu (2005) also stated that games offer different learning opportunities to meet learners' needs while practicing learning activities. Also, Harb (2007) indicated that the basic goal of the game activities is achieving enjoyment. Harb added that games can foster the affective and

social aspects of the learners' character. Besides, games can be seen as an effective tool of expression. Learners can express their emotions, feelings, thoughts and ideas through games.

Kramer (2000) indicated that games motivate students to participate; hence, they increase their activity. Using games has the following advantages. First of all, they improve the spiritual area of learners by fostering many abilities such as thinking, planning, making decision, training the mind, concentrating, processing information, and understanding the effect of systems. Moreover, they improve the emotional areas by developing students' skills and abilities in different domains such as accepting the laws, learning, working with others, accepting lose, discovering yourself and others, and using fantasy and creativity. Using games correctly should follow the following five steps. First, determining the aim of using the game. Second, playing the game by yourself. Third, ensuring it meets external expectations. Fourth, creating sufficient and apt time for the class. Fifth and last, assessing the participants' reactions and progress throughout play (Shanahan et al., 2006).

3.2.2 The Effect of Using Games on Students' Achievement

Ibrahim and Abu Hamid (2017) defined achievement "as the outcomes of the students' learning after a period of studying the subject, and their ability to remember, understand and apply the content, measured by the students' mark in the achievement test".

In fact, many studies demonstrated the effect of using games in teaching on student's achievement. For instance, Harb (2007) investigated the effectiveness of using educational games on the sixth graders' achievement of English language in the southern governorates of Gaza city. The experimental approach was used, and the sample contained 94 male students and 98 female students. The data was collected from an achievement test with 50 items. The controlled group was taught by the traditional method; however, the experimental group was taught by the educational game strategy. The results indicated that there is a statistically significant difference between the experimental and control group in favor of the experimental group. That is, the achievement of the experimental group was higher than the control group. Besides, there was a statistically significant difference due to the gender achievement in the experimental group in favor of the females. That is, the achievement of female in the experimental group was higher than the achievement of males.

In addition, Al-Mubireek (2003) investigated the effect of using computer games in teaching mathematics on students' achievement and attitudes. The sample of the study was two-fourth classes at a Midwestern Public Elementary School. The data was collected from the researcher's observation and the students' scores. The results showed that using computers games positively affected students' achievement. The results also indicated that using computer games in teaching mathematics positively affected their attitudes and motivation. The results also showed that the males performed better than the females. The study recommended using computer games

in teaching mathematics since it attracts students' attention and motivates them to enjoy the process of learning.

Furthermore, Selvi and Çoşan (2018) investigated the impact of using scientific educational games in teaching kingdoms of living things on students' academic achievement and knowledge retention. The participants of this study were 68 students from the ninth grade. The students divided into two groups which were the experimental and controlled. The experimentation of the study lasted for seven weeks. The educational games used in the experimental group were to assess, reinforce, and review topics. The results of the study revealed that there was a statistically significant difference in students' achievement between the experimental and control groups in favor of the experimental group. The study indicated that educational games positively impacted students' achievement as well as their knowledge retention.

Besides, Ibrahim and Abu Hamid (2017) investigated the effect of using interactive video games in teaching mathematics on students' achievement. The study was conducted in one basic private school in Jordan. The researcher used the quasi-experimental group design. The results of the study indicated using interactive video games in teaching mathematics had positive impact on students' achievement. That is, the results showed that there was a statically significant difference between the experimental and controlled group in favor of the experimental group.

Moreover, Kamnardsiri et al. (2017) investigated the effect of using game-based learning in learning American Sign Language on students' achievement. The sample of the study consisted of 31 participants. The number of participants in the experimental group was 17 while the number of the participants in the control group was 14 students. The experimental group studied sign language using games while the controlled group studied the sign language using the traditional method. The results of the study indicated that using games in teaching sign language positively affected students' achievement. That is, the results of the study showed that there was a statistically significant difference between the two groups in favor of the experimental group.

Also, Kuzu (2020) investigated the effect of using mind games and intelligence in teaching writing on students' abilities and achievement. The data was collected by quantitative research method. The sample of the research was seventh grade students from a public secondary school. The results of the study indicated that using mind games and intelligence positively affected students' achievement and writing ability. Besides, using mind games and multiple intelligence strategies affected students' interest and attention. The results of the study showed that there was a statistically significant difference between the two groups in favor of the experimental group.

However, Ke (2008) investigated the effect of using educational computer games in teaching mathematics on students' achievement. The sample was fourth and sixth graders. The study was conducted during a summer math camp, and the results indicated that using educational computer games in teaching mathematics had no significant effect on students' achievement.

Indeed, the majority of the studies showed that using games in teaching had positive effects on students' achievement. However, a study showed that using educational computer games had no significant effects on students' achievement.

3.2.3 The Effect of Using Games in Teaching on Students' Motivation

The Latin word *movere*, is the origin of the term motivation, means to move (Baron et al., 2002). Motivation is like a vision that activates a person to work because human behavior is attracted by some desired and needed goals (Demirci, 2007). In addition, Greenberg and Baron (2003) defined motivation as "the set of processes that arouse, direct, and maintain human behavior towards attaining some goal".

Actually, many studies demonstrated the effect of using games in teaching on students' achievement. For instance, Bernaus (1987) investigated the effect of using games in teaching English language as a second language on students' motivation. The sample of the study was a group of Spanish students aged between 14 and 15. The students studied English as a second language in a secondary school in Spain. The questionnaire was the used tool to collect data from the participants. The results of the study indicated that using games in teaching English as a foreign language affected students' attitudes and motivation positively.

In addition, Meskill (1990) investigated the effect of using games in teaching English as a second language on learners' motivation. The study sample contained 14 students who learn English as a second language. The participants speak English as a second language. The students should communicate with each other using idioms related to the game. The results indicated that using games in teaching English language as a second language positively affected their motivation.

Besides, Budasi et al., (2020) investigated the effect of using Power point game on learners' motivation and English language achievement. The researcher used the quasi-experimental design. The sample of the students was 84 students, and they were divided into two group; that is, the students of the control group were 44 while the students of the experimental group were 40. The data was collected by a questionnaire and post-test, and it was analyzed by ANOVA and MANOVA assisted by SPSS program. The results of the study showed that using the Power Point program positively affected students' motivation and achievement. Besides, it positively affected their attitudes toward learning English language.

Furthermore, Lin et al. (2019) explored the effect of using games in teaching science on students' achievement and motivation. The researcher used the experimental design by implementing the pre- and post-test design. The experimental group contained 25 students while the control group contained 26 students. The experiment used 12 lessons. The results showed that using games in teaching science affected students' achievement and motivation positively. It also enhanced the work of their memory, understanding and problem- solving skills.

Moreover, Developing (2018) investigated the impact of using digital games in teaching chemistry on students' achievement and motivation. The researcher used (MykimDG) module and the quasi-experimental design. The researcher divided the students into two groups: the experimental and control group. The results of the study showed that using digital games in teaching chemistry affected students' motivation

and achievement. The results of the study showed that using games in teaching chemistry fostered students' engagement, and it enhanced their motivation.

Furthermore, Kayan and Aydin (2020) investigated the effect of using computer-assisted educational games in teaching grammar on students' achievement and motivation. The researcher used the quasi-experimental design, and the data was collected in a quantitative way; that is, the researcher used the pre- and post-tests. The participants were two classes of sixth grade students studying at a middle school. The intervention period was a 12-week period. The results demonstrated that the experimental group achieved higher than the control group, and the motivation of the students was positively affected. Besides, the students' attitudes toward grammar were positively affected.

In addition, Virvou et al. (2005) investigated the effect of using designed computer games in teaching geography of the fourth-grade students on students' motivation. The aim of the game was to navigate through a virtual environment while answering questions related to geography. The game gives students points when they are correct. The game designed by integrating three-dimensional (3D) environment into their game design. The results of the game showed that using computer in teaching geography increased students' motivation and performance. The games also helped students to participate and play their roles. Hence, it also affected their performance. Goehle (2013) found that games increase students' enthusiasm and involvement. That is, games help students to play their roles, and they foster students' engagement. Hence, games increase students' motivation to learn.

However, Dekkers and Donatti (1981) found that there is a negative relationship between the times of using the game and its motivation. That is, when the teacher uses the same game different times, the amount of motivation will decrease gradually.

Indeed, the majority of the studies showed that using games in teaching had positive effects on students' motivation. However, a study showed that there is a negative relationship between the times of using the game and its motivation. That is, the results of the study indicated that teachers should use a number of games to keep students motivated.

3.3 Conclusion and Discussion

From the previous literature review, we found that games have positive effects on students' motivation and achievement. Besides, the process of using games in the classroom should take the following steps into consideration respectively. First, determining the aim of using the game. Second, playing the game by yourself. Third, ensuring it meets external expectations. Fourth, creating sufficient and apt time for the class. Fifth and last, assessing the participants' reactions and progress throughout play.

The studies also revealed that the language of the play is easy for all people regardless of their background, gender and individual differences (Azriel et al., 2005). Hence, games create a special learning environment that lets students to play their

roles, involve in the process of learning and get fully engaged. Thus, games help learners to participate more and more, this comes in line with Kramer (2000). Of course, this will create an enjoying atmosphere and develop students' affective and social aspects of their character (Harb, 2007). When the students are active, they feel that they are co-creators of knowledge, which makes them confident and enthusiastic. This process creates an interest that encourages students to be creative and active participants. The enjoying environment lightens the mood of the students (Shatz & Loschiavo, 2005). Consequently, the process of lightening the mood fosters communication that creates effective learning environment (Wycoff & Pryor, 2003). Thus, it will create a want to learn environment that comes in line with the results of Wycoff and Proyer's study.

The increasing learning desire is a result of high motivation. That is, using games affects students' motivation. This comes in line with many studies such as Bernaus (1987), Meskill (1990), and Kayan and Aydin (2020) who found that using games in teaching English language positively affects students' motivation and attitudes. It is obviously clear that using games in teaching creates communicative learning atmosphere (Wycoff & Pryor, 2003), which is a basic pillar for teaching languages. In addition, it comes in line with other studies such as Lin et al., (2019) who found that using games in teaching science positively affects students' motivation, and Developing (2018) who found that using games in teaching chemistry positively affects students' motivation. In addition, these results come in line with the study of Virvou et al., (2005) who found that using games in teaching geography positively affects students' motivation.

However, if the teacher uses the same game every time, the game will lose its attractiveness; hence, the level of motivation will decrease. This comes in line with Dekkers and Donatti (1981) who found that there is a negative relationship between the times of using the game and its motivation.

Games increase students' enthusiasm (Goehle, 2013); hence, students will be very active and play their roles effectively since games offer different learning opportunities that meet learners' needs (Yu, 2005). Of course, meeting learners' needs is based on the sufficient feedback that games provide which help teachers to fill the gaps and reduce obstacles that students might face (Shanahan et al., 2006). This comes in line with Corno and Snow (1986) who found that the best way to educate a diverse group of learners is responding to their needs, and games can satisfy students' needs through different styles and approaches. Thus, this will create a great and inspiring learning atmosphere that creates a want to learn environment which comes in line with the results of Wycoff and Proyer's study.

When the students learn more, they will achieve more grades, and their performance will be improved. Besides, when the students are highly motivated, their achievement will increase (Ahmed & Wias, 2012). This comes in line with many studies that showed using games positively affects students' achievement such as Harb (2007) who found that using educational games in teaching English language positively affected students' achievement, Al-Mubireek (2003) who found that using educational games in teaching mathematics positively affects students' achievement, Selvi and Çoşan (2018) who found that using games in teaching the kingdom of

the living things positively affects students' achievement, Ibrahim and Abu Hamid (2017) who found that using video games in teaching mathematics positively affects students' achievement, Kamnardsiri et al. (2017) who indicated that using game-based learning in teaching sign language positively affects students' achievement, and Kuzu (2020) who found that using games in teaching writing positively affects students' achievement and performance.

However, a study showed that using games in teaching did not affect students' achievement. For instance, Ke (2008) found that using educational computer games in teaching mathematics did not affect students' achievement. We think there are many reasons for this result. First of all, the teacher or the researcher did not choose the suitable game that suits teaching mathematics. Besides, we think that the game did not follow the good characteristics of the game. First, they should be interesting and fun. Second, they should rule-governed. Third, they should be competitive. Fourth, they should be goal defined. Fifth, they should be engaging. Sixth, they should have a closure (Yu, 2005). Therefore, teachers should find the game that matches the characteristics of the effective game. Moreover, the teacher or the researcher did not use the game in an appropriate way. In order to let the game be effective, teachers should follow the specific steps. First, determining the aim of using the game. Second, playing the game by yourself. Third, ensuring it meets external expectations. Fourth, creating sufficient and apt time for the class. Fifth and last, assessing the participants' reactions and progress throughout play (Shanahan et al., 2006). Otherwise, the game will not be effective, and it will not achieve the desired and needed objectives.

Therefore, the researchers recommend teachers to use games in teaching since they have positive effects on students' achievement and motivation. The researchers also suggest that the teacher should take into consideration the characteristics of effective games. Hence, the game will enrich the process of learning. The researchers also recommend teachers to follow the steps of using games inside the classroom since they direct teachers to let the game create positive effects. The researchers also recommend other researchers to conduct more studies on the best ways of using games in the classroom since there is a lack of studies in this domain.

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Chapter 4
Technostress and Students' Academic Productivity: A Positive Impact

Maysa Abuzant, Kifaya Ahmad Sabbah, and Monji Ghanem

Abstract The use of Information Systems (IS) in education has proved to be effective. Yet, it is also a cause of stress. Technostress (TS) is stress triggered by the use of IS. It has been linked to inversely affect users' productivity. However, TS could also be appraised positively leading to better outcomes. This link has not been thoroughly investigated from a student's perspective as the end-users of IS in the learning process. This study aims at investigating the role TS plays in students' productivity using an explanatory mixed-methods study design. Participants (N = 321) filled out a survey to measure their TS level and its impact on their academic productivity. Then 10 students were selected to participate in a semi-structured interview to understand the factors underlying students' TS and its impact on the TS productivity relationship. The results of the study indicated that students experienced a low level of TS that had a positive impact on academic productivity. Students perceived the stressors caused using IS such as techno-uncertainty and techno-complexity as challenges that through the use of coping mechanisms such as social support they had a positive impact on their academic productivity.

Keywords Technostress · Academic productivity · Mixed methods

4.1 Introduction

Technostress (TS) is stress triggered by the use of Information Systems (IS). With the widespread use of IS in all walks of life, TS has become a center of interest for researchers to study (Tarafdar et al., 2019). However, in the academic context, the research on TS is still novice (Upadhyaya & Vrindaa, 2020). IS has been widely used

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in educational contexts to support online learning and teaching due to the number of benefits it has proved to have, out of which is its effectiveness, cost-effectiveness, and availability for anyone with internet access (Castro & Tumibay, 2019). Nevertheless, up until the end of 2019, the choice to resort to online learning was somewhat optional. This would change as due to the nationwide lockdowns and social distancing norms most educational institutions had to find refuge in online learning. Without any previous notice, academic institutions found themselves socially isolated and having to deal with a surge of new IS and adapt their learning styles to fit the new context. That kind of change requires students to change their learning patterns, invest more time, and acquire new technical skills to maintain their education, effectively. Consequently, students may feel frustrated and distressed, causing them to experience TS (Tarafdar et al., 2019).

4.2   Literature Review

TS refers to the stress experienced by individuals due to the use of IS (Tarafdar et al., 2019). According to Ragu-Nathan et al. (2008), TS is the result of work environments that are characterized by an extreme dependence on the use of IS, in addition to, the existence of a gap between the users' level of IS knowledge, and the actual knowledge needed to perform tasks using IS. And finally, a raised level of social isolation, and the invasion of non-work time by the continuous connectedness to IS. These work environments require users to change their work patterns, invest more time, and acquire new technical skills, leaving them feeling frustrated and distressed (Brod, 1984; Hudiburg, 1989).

Tarafdar et al. (2007) identified five stressors "triggers" leading to TS which were then widely used in TS literature (La Torre et al., 2019). These five stressors are:

- Techno-invasion which is the invasion of the users' space and time by constant connectivity to the IS (La Torre et al., 2019; Ragu-Nathan et al., 2008; Tarafdar et al., 2007).
- Techno-overload which refers to the users being forced by the use of technology to do more work than they can handle (La Torre et al., 2019; Tarafdar et al., 2007).
- Techno-complexity which happens when users perceive IS as too complex to understand in order to perform the required job (Tarafdar et al., 2007).
- Techno-insecurity stems when users feel insecure about their technological abilities (Tarafdar et al., 2007), which constitute a threat of job-insecurity (Ragu-Nathan et al., 2008).
- Techno-uncertainty is the feelings of instability, caused by constant changes and updates to the IS (La Torre et al., 2019; Tarafdar et al., 2007).

4.2.1 Technostress; A Dark and A Bright Side

Although the term Technostress was first coined by Brod (1984) as a negative impact of a users' inability to deal with the IS, there have been a number of recent attempts to highlight not only the negative effects of Technostress but also the positive ones (La Torre et al., 2019; Tarafdar et al., 2019). Having its roots in the transactional theory (Lazarus & Folkman, 1984; Tarafdar et al., 2019), Tarafdar et al. (2019) argue that technostress could have both positive and/or negative impacts on the users based on their appraisal process of the stressors and their ability and available resources to deal with them. This argument is formulated into The Technostress Trifecta Framework.

The framework suggests the existence of two distinct but related transactional phenomena; techno-eustress and techno-distress. Techno-eustress reflects how the user deals with Technostress positively. The stressors create a challenge for the users which leads to activating coping behaviors to master the challenges in a positive way and arrive at positive outcomes. There have been several studies relating technostress to positive outcomes such as increasing organizational commitment, enhancing job performance and productivity (Tarafdar et al., 2019). On the other hand, techno-distress captures the negative side of technostress; it occurs when users of the IS perceive the stressors as a threat that they cannot tackle with their resources, resulting in negative outcomes. The literature has widely investigated the negative outcomes of techno-distress. It is reported that low productivity (Zhang et al., 2016), poor performance, satisfaction, and organizational commitment (Tarafdar et al., 2007) are the most reported outcomes of Techno-distress (La Torre et al., 2019).

4.2.2 Technostress in Higher Education

Despite the fact that Technostress has been adequately investigated in organizational and business settings, it is still under-researched in educational settings (Upadhyaya & Vrinda, 2020). However, there have been number of attempts to understand the effect of Technostress on students. The results of these studies oscillated between negative and positive outcomes, leaning more toward the negative ones.

In a study conducted to measure technostress for both undergraduate and graduate students (Hudiburg, 1989), the results revealed that increased computer use leads to increased computer-related stress. High levels of stress could lead to negative consequences; Wang et al. (2020) investigated technostress among university students and reported that the dimensions of technostress were positively associated with students' burnout, which negatively affected their perceived performance. Upadhyaya and Vrinda (2020) reported that students experienced a moderate level of technostress, and explained that technostress induced by techno-uncertainty was found to be the least, while Techno-invasion was found to be the highest contributor of Technostress among students. That is speculated to be a consequence of the limitless exposure to technology, which has led to the invasion of personal time.

In line with the positive outcomes, a study (Qi, 2019) investigated the effect of using mobile phones to aid learning on students' Technostress level. The results revealed that students did not perceive having to use mobile phones to learn as a cause of technostress. On the contrary, Students' academic usage of mobile devices was positively associated with students' academic performance. Qi (2019) attributes these results to students' high sense of technology.

4.2.3   Technostress and Academic Productivity

Productivity generally refers to the ratio of output and input. Tarafdar et al. (2007) define productivity as "increased work efficiency and output during work hours through mobile technologies as perceived by staff members." However, in an academic setting productivity is not mere outputs and inputs; as students are considered the raw material (input), and the output of the learning process, while being actively involved. Hence, education is a unique in that it requires learners to create knowledge and meaning in the context of their own lives (Monk, 1992). Therefore, students' own perception of their productivity is key in measuring this construct.

The link between technostress and productivity has been established on different occasions (La Torre et al., 2019; Tarafdar et al., 2007, 2015; Tiwari, 2020). However, this link has gone both ways as some studies have detected a decrease in productivity as a result of stress. While other studies found out that productivity increased when impacted by technostress. In fact, Tarafdar et al. (2007) has shown that productivity and technostress are inversely related. That was confirmed by Hung et al. (2011) who has reported that Technostress negatively affects employees' productivity. However, in a later study Hung and Chou (2015) reported that techno-overload could lead to a significant increase in productivity. That negative link between Technostress and productivity has been confirmed in academic setting by Upadhyaya and Vrinda (2020). Moreover, TS has been positively associated with university students' burnout, affecting students' perceived performance in technology-enhanced learning (Wang et al., 2020).

4.2.4   Research Questions

This research aimed at investigating the role technostress plays in students' academic productivity by answering the following questions:
Quantitative inquiry questions:

- Q1: What is the students' technostress level?
- Q2: What is the impact of technostress on academic productivity?
- Qualitative inquiry questions:
- Q3: What are the factors that contribute to students' perceived technostress level?

- Q4: How do students perceive the impact of technostress on their academic productivity?

4.3 Methodology

This research investigates the role technostress plays in students' academic productivity. A two-phase explanatory mixed-method design using both qualitative and quantitative data collection and analysis procedures was used. This design was chosen to offer a further explanation of the results from the qualitative data and build on them using the quantitative data (Creswell & Pioano Clark, 2007).

4.3.1 Quantitative Data Collection

To assess the impact of Technostress on academic productivity, a quantitative research design was implemented using structural equation modeling (SEM).

4.3.1.1 Research Context and Participants

The participants for this research were undergraduate students in Palestine who, since the start of Covid-19, have fully shifted to online learning. Moodle is used as the main learning management system to manage the learning process.

The research questionnaire was sent by email and social media to about 2000 undergraduate students. 321 completed responses were received, with a response rate of 16%. Among the respondents, 77% of students were female and 23% were male. The university level of students distributed as follows; 16% 1st year, 38.5% 2nd year, 26.2% 3rd year, 15.6% 4th year, and 3.7% 5th year.

4.3.1.2 Instruments

An adapted version of the Tarafdar et al. (2007) questionnaire was used to measure students' technostress and academic productivity. The adapted questionnaire, used by Upadhyaya and Vrinda (2020), constituted 23 items, and 6 domains. However, after the factor analysis two items constituting one domain were dropped out from the scale that constituted the Techno-insecurity domain, leaving a scale of 21 items and 5 domains: Techno-overload, Techno-complexity, Techno-uncertainty, Techno-invasion, and Academic Productivity.

4.3.2   Qualitative Data Collection

To answer the third research question and build on the results from the first phase, a
qualitative research method was implemented.

4.3.2.1   Participants

Ten students were interviewed: 6 females and 4 males. These students were chosen
among the 321 students who filled out the questionnaire in the first phase. The 10
students were selected to represent the multidisciplinary nature of the original sample.

4.3.2.2   Instruments

For the qualitative analysis, the data was collected using a semi-structured group inter-
view. The interview was conducted via Zoom and recorded. All participants were
informed about the reasons behind the interview and verbal consents were taken
before recording the interview. To analyze the data from the interviews, thematic
analysis using Braun and Clarke (2006) six-phase guide was followed. To ensure
trustworthiness the analysis and coding of the interviews were first done individu-
ally by the three researchers, then the resulting themes were cross-checked and a
consensus to common themes was found.

4.4   Analysis, Results, and Discussion

This section starts with presenting the quantitative and the qualitative data anal-
ysis. And finishes with using the qualitative results to explain the findings from the
quantitative analysis.

4.4.1   Quantitative Results

The results of this section are based on the data collected from the questionnaire.

4.4.1.1   Technostress Scale Validation and Reliability

The initial review of data revealed the absence of any missing data in the responses
received. A confirmatory factor analysis was run to ascertain the structure of the
sub-constructs of technostress and ensure construct validity. The factor analysis with

the principal component method and varimax rotation was used (Ho, 2014). The results indicated an acceptable value of Keiser-Meyer-Olkin (KMO) of 0.849. As per Upadhyaya and Vrinda (2020), values of KMO greater than 0.5 Education and Information Technologies would indicate the validity of the factor analysis. The output of the factor loadings of all the 23 items in the instrument in the rotated component matrix was observed and items with factor loadings of less than 0.3, and less than three items, were removed from further analysis. This is due to the need of a minimum of three items to load significantly on each factor in a multidimensional scale, for all of the subscales to be successfully identified (Raubenheimer, 2004). It was observed that the fifth factor of the Techno-insecurity had less than three items (two items), therefore it was dropped off from further analysis (Table 4.1).

Table 4.1 Measurement items reliability statistics

Construct	Number of items	Cronbach alpha	Mean	Standard deviation
Techno overload	4	0.493	2.27	0.60
Techno complexity	5	0.736	1.90	0.75
Techno uncertainty	4	0.873	2.89	0.90
Techno invasion	4	0.799	2.95	0.81
Academic productivity	4	0.918	2.70	1.04
Technostress	21	0.738	2.55	0.42

Table 4.2 The standardized estimates and model fit indices

			Standardized estimates
Technostress	←	Techno-overload	−0.684
Technostress	←	Techno-complexity	0.509
Technostress	←	Techno-uncertainty	0.431
Technostress	←	Techno-invasion	0.396
Academic productivity	←	Technostress	0.640
AP1	←	Academic productivity	0.896
AP2	←	Academic productivity	0.880
AP3	←	Academic productivity	0.803
AP4	←	Academic productivity	0.848
Model fit indices			
Chi-square (df)			322.368 (174)
Chi-square/df			1.853
CFI			0.952
TLI			0.942
SRMR			0.069
RMSEA			0.052

Table 4.2 presents the reliability statistics and the key descriptive statistics of the Technostress dimensions. The Cronbach alpha of all the measures was found to be more than 0.7, except for techno-overload which was 0.5, indicating an acceptable level of reliability and inter-item consistency of the scale (Nunnally & Bernstein, 1967). Just Techno-overload has about 0.5.

Overall Technostress level was found to be 2.55 (on a scale of 5) which indicates a low level of Technostress among students. Students had a low perception of the role of technology in improving academic productivity, with a mean of 2.70. These results are somewhat similar to (Upadhyaya & Vrinda, 2020) who reported that students are experiencing a moderate level of technostress.

It is also observed that overall students experience a low level of Techno-overload (mean: 2.27), Techno-uncertainty (mean: 2.89), Techno-invasion (mean: 2.95), and a very low level of Techno-complexity (mean: 1.90). These results indicate that Techno-invasion is the highest factor contributing to their technostress. That could be due to the structure of time that students have lost while moving into online learning. That move blurred the lines between study and leisure time as classes and exams are not bounded by time and day, neither is study and family time. On the other hand, students perceived techno-complexity as a weak factor into their Technostress. This could be due to the fact that these students are what Prensky called digital natives (Bennett et al., 2008) they were born into a technology-filled environment. These students are said to be active experienced learners, proficient in multitasking, and dependent on communications technologies for accessing information and for interacting with others.

4.4.1.2 Technostress and Academic Productivity

To assess the impact of Technostress on academic productivity, the structural model was assessed using AMOS 21. CFI (Comparative Fit Index) and TLI (Tucker Lewis Index) are popular goodness of fit measures in SEM and values closer to 1 indicates a good model. A cut-off values of 0.95 for CFI and 0.94 for TLI are considered to be an acceptable model (Hu & Bentler, 1999). Lower values of badness-of-fit measures of Root Mean Squared Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR), closer to zero, indicate a good model (Kline, 2015). Hu and Bentler (1999) recommended a cut off value of 0.08 for SRMR and 0.06 for RMSEA. The standardized estimates and model fit indices are presented in Table s. The model fit indices for SEM, suggested by Hu and Bentler (1999), namely, CFI (0.952), TLI (0.942), SRMR (0.069), and RMSEA (0.052) were found to be within acceptable cutoff criteria.

The results also indicated a positive impact of Technostress on academic productivity ($p < 0.01$). These results were inconsistent with most previous studies on Technostress in both academic (Upadhyaya & Vrinda, 2020) and non-academic contexts (Hung et al., 2011; Tarafdar et al., 2007; Tiwari, 2020). However, these results support (Tarafdar et al., 2019) proposition of having 2 distinct but related transactional models of Technostress based on the users appraisal of the situation they are facing, which are

Techno-eustress and Techno-distress. According to Tarafdar et al. (2019), Eustress happens when the users perceive the characteristics of the IS as challenging and view it as a chance to achieve better outcomes. Ortiz de Guinea (2016) argued that IS users' intuitive response when faced by a negative situation is to try to fix or deal with the situation, in spite of its difficulty, before evaluating the resources they have to overcome that threat. That could explain the positive impact Technostress has on productivity on our research. Moreover, using Moodle as the main platform for online learning could have impacted the result. In a study by Teo et al. (2019) students have reported perceiving Moodle as easy and useful which strongly affected their attitudes toward it.

The results have also revealed that out of the four Technostress dimensions, Techno-overload was found to negatively affect students' Technostress. That means that students had to do more work than they can handle or to work for longer periods than they are used to, which increased their Technostress levels (La Torre et al., 2019; Tarafdar et al., 2007), which contradict Hung et al. (2015) who reported that techno-overload leads to a significant decrease in productivity. On the other hand, techno-complexity, techno-uncertainty, and techno-invasion had a positive impact on students' technostress. With techno-complexity having the biggest impact on students' Technostress while techno-invasion have the lowest. Meaning that students did not perceive these dimensions to add to their Technostress. That result will contradict results from the qualitative analysis.

4.4.2 Qualitative Results

The thematic analysis of the interview scripts has yielded four different themes; technical skills, positive outcomes, technological unreliability, negative outcomes.

4.4.2.1 Technical Skills

Students' technical skills and its relation to technostress is one of the main themes that emerged during the interview. Students have mentioned that at the beginning there was this fear of dealing with new technologies, which increased their stress levels, especially those students who had no experience dealing with online learning. One student said:

> At the beginning of online learning, this thing was new to me and I did not know anything. It was a situation of fear and panic.

That extract highlights the coping mechanism that students used to the stress arising from dealing with new unfamiliar technologies. However, another coping mechanism used was the development of their technical skills using technological tools such as Moodle and Office. That was contradicted by other students answers who disagreed and did not mention any noticeable changes in their technical skills.

In contrast, number of the students stressed that they did not face any technical difficulties using Moodle.

4.4.2.2 Technological Unreliability

The main issue that was highly stressed during the interview and that undoubtedly increased students' level of technostress is related to problems with the infrastructure such as consistent power cuts, internet disconnection, and instability of the used tools, especially during exam times and while submitting assignments. One student said:

> Internet disruption is a big problem; in the middle of the exam the internet will disconnect.

In addition, students faced some technical difficulties due to problems with the hardware or even the lack of technological equipment such as headphones and laptops. That resulted in dropping down their grades, especially those grades related to participation during the synchronous classes.

Another issue was the lack of computers available to be used by all family members or the lack of a quiet place to study online. That pushed students to depend on their mobile phones which caused them vision problems. That is clear in the next extract from one of the students:

> At home, we have more than one student learning online. The laptop is not always available. Most of the time I use my mobile phone. My vision is getting worse.

4.4.2.3 Positive Outcomes

One of the main positive outcomes related to productivity is the development of students' technical skills. With time, students became more accustomed to doing their assignments using computer Apps and Moodle.

Another positive outcome was that students acquired new research and problem-solving skills which made them more autonomous learners. One student explained:

> Now, I no longer procrastinate doing tasks. I have learned how and where to get the information from. I try to search for alternatives to do my homework.

Finally, several qualities were added to the classes, one of which is having recorded lectures. Another one is the constant reminders of the assignment's deadlines. Students have stressed that these qualities have helped to lessen their stress and anxiety.

4.4.2.4 Negative Outcomes

All students agreed that online exams triggered their stress. This is because the time allocated for the exam did not suit the number nor the difficulty level of the questions. Moreover, the way the exam is usually laid out intensifies the feelings of

anxiety and stress as one never knows what the next question is going to be about. This is explained by one student as:

> In online exams, you cannot see all the questions at once, so you feel like the next question is going to be difficult and needs more time. This puts me under a lot of pressure and stress.

As for the outcomes of using technology, one important thing is that this type of learning and teaching lowered their GPAs, which raised their concerns in not being able to get a certain job or a scholarship.

Finally, students have identified techno invasion as a source of technostress in their lives, which has caused students to be socially isolated and unable to organize their time properly.

4.4.3 Explaining the Quantitative Results in the Light of the Qualitative Results

The results of the quantitative analysis have revealed that students express a low level of technostress that is positively correlated with their academic productivity. It is clear from the interview results that students, despite facing some difficulties while using the technology, they did appraise most of these difficulties as a challenge and not a threat, which is a sign of students experiencing eustress and not distress (Tarafdar et al., 2019). This appraisal has caused them to develop coping mechanisms in a short period of time that allowed them to use that stress to achieve more and gain more skills.

Techno-complexity was reported by the results as the highest contributor to student's technostress. That was confirmed by the results of the interviews as students have highlighted that their inability to deal with the technology at the beginning of their experience was a major source of stress. However, with the right support and more efforts, they were able to overcome that threat and use it as a challenge for developing their skills. Consequently, enhancing their academic productivity through skills such as task prioritizing, time management, and autonomous learning skills.

Nevertheless, there are aspects of technology use in learning that remain to be a source of stress, one of which is online exams. The qualitative results revealed that online exam anxiety is a contributor to student's Technostress. As well as the drop in their GPA's. However, that may not contradict with the results of the quantitative findings as it has been reported that students could experience stress without negatively affecting their academic performance and/or productivity (Frazier et al., 2019).

4.5   Conclusion and Recommendations

This study aimed investigating the link between technostress and students' academic productivity using an explanatory mixed-methods study. In previous literature, technostress has been linked to inversely affect productivity. However, the findings of this study revealed that students' technostress level positively impacts their academic productivity. Students have faced several threats while using technology in the educational context. These threats were perceived by students as a challenge that they have turned into positive outcomes using multiple coping strategies such as relying on friends and family for support. Educational institutions could use the results of this study to understand how technostress impacts student's productivity and provides their students with the needed psychosocial support to lessen its impact on their learning outcomes. More studies need to be conducted on the impact technostress has on students, especially now that online learning and the use of technology in education has had a major jumpstart due to the current situation. That is expected to change the dynamics of using IS in education post-pandemic.

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Chapter 5
Modern Learning Strategies Used by Teachers to Increase Students' Motivation Toward E-learning in Many Societies

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Abstract This study examines the modern learning strategies that teachers employ to increase students' motivation for e-learning in six societies (Palestine, Bahrain, Turkey, the United Kingdom, Canada, and the United States), as well as the impact of these strategies on increasing students' participation in the e-learning process, the learning strategies employed by teachers, and the challenges they face. By performing separate open semi-structured interviews with a group of ten teachers, the study used the qualitative Methodology of (multiple) case study method. The findings show that teachers use learning strategies differently in the e-learning process and that these strategies are critical in raising students' interest, enhancing their attention, and encouraging them to engage in e-learning. The findings also revealed the most significant challenges that teachers faced when implementing these educational strategies in e-learning, which were broken down into material, technological, technical, educational, and skills-related challenges, and ways to improve them. In order to resolve these obstacles, the participants recommended providing students and parents with materials and technical assistance. The current study suggests that teachers be trained and qualified in order to efficiently use e-learning strategies.

5.1 Introduction

The Corona pandemic casts a shadow over the educational sector around the world, requiring educational institutions in all forms to make a rapid transition from face-to-face learning to e-learning, especially after the information technology revolution,

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which has pervaded almost every aspect of life and has become an integral part of it. As a result, incorporating technology into the educational process has become a global trend, and the provision of digital educational content has become a learning catalyst.

In our current period, educational institutions are attempting to respond to the rapid growth of the digital age, with all efforts focusing on developing innovative methods focused on the use of various digital tools (Shi, 2017). As a result, educators in the digital age strive to create digital learning methods that improve learning while also developing students' thoughts and imagination, making them active participants in their education (Ismaeel & Al Mulhim, 2019).

Teaching students how to learn, recall, and think, as well as motivating them to learn, requires the use of modern learning strategies that make the learning process easier (Karmakar & Nath, 2014). By selecting and implementing various learning strategies, approaches, and techniques that support and promote active, innovative, and effective learning, the instructor is considered a major factor in developing an active learning environment (Vibulphol, 2016). Learning strategies are defined as a set of mental tactics that teachers use to motivate students to learn, to develop thinking and problem-solving skills, and to help them improve their technical, professional, and social skills (Shi, 2017).

Many modern learning strategies, such as brainstorming, exploration learning, gamification, and many others, have adopted constructivism theory into their design, implying that the learner is responsible for his learning (Sousa et al., 2017). Many educational studies have emphasized the importance of strategies for increasing learner motivation in electronic learning environments, which aim at focusing on comprehension rather than rote learning and improving e-learning actions through thought, interpretation, and implementation skills, which lead to problem-solving and improve the quality of learning outcomes (Ismaeel et al., 2019).

E-learning has grown in popularity as a result of its versatility, which addresses all of the needs that conventional learning cannot (Barak et al., 2016). E-learning is a new term that focuses on the learner's involvement in the learning process and makes him more capable of acquiring various learning skills. E-learning is considered an important option in the face of crises because it creates a simulated learning atmosphere that guarantees the learning process's continuity (Alhabeeb & Rowley, 2017). As a result, the importance of e-learning emerges as a requirement enforced by multiple crises, such as the Corona pandemic, and because of its characteristics that make it more acceptable to prevent the pandemic's negative effects on the learning process (Murphy, 2020).

The move to e-learning was not made on the spur of the moment; rather, the Corona pandemic that swept the east and west of the globe, affecting all walks of life, including education, prompted the change to e-learning as a safe haven for students to pursue their studies and acquire knowledge. This transformation has changed how students interact with teachers and classmates, or even with their study materials. This is what prompted educators and teachers to look for different e-learning strategies that would involve students in the learning process and enable them to be more self-directed in their learning. This research will describe the modern

learning strategies used by teachers in six societies in order to influence student motivation for e-learning, in particular, it raises the following questions:

- What e-learning strategies do teachers employ?
- How are learning strategies employed in e-learning?
- What is the importance of using learning strategies in e-learning?
- How do learning strategies affect students' motivation toward e-Learning?
- What are the challenges facing the use of learning strategies in e-Learning?

5.2 Literature Review

Teaching is one of the most difficult careers, and teachers are the backbone of the educational process, assisting students in understanding and developing their skills, as well as motivating them to learn through the use of different learning strategies and techniques (Alhabeeb & Rowley, 2017). These strategies help to involve students in the learning process, by practicing a set of activities in the educational situation, which helps students to form their knowledge structure and develop higher thinking skills (Suwanarak, 2019).

5.2.1 Learning Strategies and Their Types

Learning strategies are defined as: Complex and sophisticated procedures that the teacher uses in an intended way to impart knowledge to students and achieve learning goals (Suwanarak, 2019). While Sousa et al. (2017) stated that Digital learning strategies are new ways of teaching using technology to enhance education quality and engaging students in the educational process. Researchers have defined e-learning strategies as modern technological methods employed by the teacher in the e-learning situation, aiming at integrating students into the educational process and increasing their participation to achieve the desired educational goals.

Modern education aspires to capture students' attention and improve their thought processes, as well as to transfer knowledge to learners, enhance different learners' skills, and increase their competitiveness through the use of modern learning strategies that go beyond lecture and note-taking (Alhabeeb & Rowley, 2017). It has recently been observed that teachers' use of digital learning strategies is increasing, due to their clear impact on activating students' participation in the educational process, strengthening students' learning experience, delving deeper into the learning process, expanding access to information, and enhancing their personal competencies (Sousa et al., 2017). By reviewing the theoretical literature, this study will discuss some active learning strategies that are used effectively in digital learning, namely:

First: Collaborative Learning Strategy which encourages students to work together and supports them in their pursuit of information, creativity, and exploration in order

to gain a better understanding and find solutions to problems (Shi, 2017). Typically, students are divided into groups to complete a project, compete in an activity, or discuss a subject, and during this process, students learn from their peers and collaborate in learning both within and outside of the classroom, resulting in continuous participation and knowledge accumulation (Karmakar & Nath, 2014).

Second, gamification strategy: The most common concept of gamification is the use of game mechanics to involve students in the educational process and digitally inspire them to achieve their goals by making tasks more like games and incorporating parts of certain games into the process (Gachkova et al., 2020). Gamification is the application of game elements and mechanisms in a digital educational context in a way that draws attention and encourages more intense participation in the sharing of knowledge, as well as student interest in the learning process in a fun way (Yamani, 2021).

Third: The Flipped Classroom Strategy: This strategy is known as flipped learning in the context of "reversed" classes. It is a modern educational strategy that aims to use technological and digital technologies in such a way that the teacher can plan the lesson through video clips, audio files, or other means (Elfeky et al., 2020). The students then watch it before attending the class, and the video, as well as its components and goals, are discussed in class. The video is an important component of this strategy of instruction, in which the instructor creates from 5 to 10 min video and shares it with students through a website or social media platform (Jdaitawi, 2019).

5.2.2   Learning Strategies and Motivation Toward e-Learning

The learning process seeks to educate individuals and teach them how to learn, as well as how to look for new knowledge and apply it in their daily lives. In order to engage in the learning process, students must be motivated and use learning strategies that encourage them to learn (Saracoglu, 2020). Today, education is attempting to adapt to the modern technological paradigm by concentrating its energies on developing new strategies focused on the digital age's application (Cubillo Arribas, 2014). Hariri (2020) stresses that the use of learning strategies and the presence of motivation in students for learning are positively linked, and we find that motivation to learn is closely related to the strategies used in the learning process from this perspective.

According to Barak et al. (2016), motivation is a cause or goal that drives a person to act in a certain way in a given situation. El-Adl and Alkharusi (2020) show how using self-structured learning strategies increases students' intrinsic motivation to learn. On the other hand, Suhaili and Wonorahardjo (2020) argue that using learning strategies as a Think-Pair-Share strategy with LMS motivates students toward interaction and participation in the learning process.

5.2.3   e-Learning

The concept of e-learning arose from the widespread use of digital tools in the learning process, as doing so requires the instructor to include strategies and active learning methods focused on the student, inspire students, and provide them with modern learning skills, all of which increase their desire to learn positively, while not neglecting the role of the teacher as a guide and facilitator for this process (Fandiño et al., 2019). (Murphy, 2020) defines e-learning as a new method of acquiring knowledge, experience and, skills that transfers the responsibility of learning from teachers to learners, and helps to develop students and provide them with modern learning strategies.

5.3   Methodology

The aim of this study is to determine the role of learning strategies in influencing motivation for e-learning in six different societies. Where these Palestine and Bahrain were chosen intentionally as developing countries, four educationally and economically advanced countries (Britain, America, Canada, and Turkey) were chosen to benefit from their experiences in e-learning. A qualitative analysis study using the multiple case study approach was deemed appropriate, as it allows for a more in-depth understanding of the issue under investigation (Creswell, 2012). The multiple case study approach is often used in the educational and social fields to examine a variety of cases in order to explain their distinctions and discover commonalities (Vannoni, 2015). The multiple case study strategy helps to discover the variation between cases (Levings, 2015).

5.3.1   Study Sample

This study included ten teachers from the following countries: Palestine, Bahrain, the United States of America, Turkey, Canada, and the United Kingdom. They were given fictitious names. The characteristics of the participants are described in Table 5.1.

5.3.2   Interview Procedures

The researchers established two key requirements for participation in the study. The first is participants' willingness to participate in the Zoom interview and their

Table 5.1 Sample description

Name	Age	Country	Occupation	Degree	Specialization
Basma	33	USA	Teacher	Bachelor	Math
Salha	40	USA	Teacher	Master	Administration
Ruba	39	Palestine	Teacher	Bachelor	Primary education
Fidaa	36	Palestine	Teacher	Bachelor	Physics
Fatema	44	Turkey	Teacher	Bachelor	English
Ahmad	52	Turkey	Teacher	Bachelor	Physics
Ikhlas	35	Bahrain	Teacher	Bachelor	Classroom teacher
Suad	32	Bahrain	Teacher	Bachelor	Classroom teacher
Rami	48	Canada	Professor	Master	Math
Jack	43	Britan	Professor	Ph.D.	Network security

agreement to record the interview, and the second is the participant's ability to provide a clear image of the e-learning system used in their country.

The researchers conducted interviews with the ten participants by scheduling an appointment in advance via the Zoom platform, and the interview lasted approximately (40) min, during which the participants were asked to answer four open questions: "What learning strategies do you use as a teacher in the E-learning learning process?," "How do you think learning strategies impact students' motivation toward e-learning?," "tell us about the most critical challenges you faced while using learning strategies?," and "What are your tips to address the challenges you faced?" The interviewer asked some sub-questions to achieve the study's objective, as well as some clarifying questions and brief discussions to explain some of the points that were unclear during the interview. The interviews were taped, then transcribed, and the transcripts were sent to the participants for review.

5.3.3 Collecting and Analyzing Data

Data were gathered through semi-structured interviews with open-ended questions, as well as by asking questions that were relevant to the research questions (Maxwell, 2013). Multiple case study analysis was used on the data collected from the ten participants, allowing us to discover the variance between cases. There are many relationships that can be compared with each other, and some results that cannot be obtained from a single case study are generalized (Levings, 2015). The data was analyzed using the Ary et al. (2010) model, which consists of three stages: arranging the data, coding and shrinking it, and finally interpreting the data.

The study relied on the analysis on three main axes: the learning strategies that teachers use in e-learning, the role of learning strategies in e-learning, and the challenges facing the employment of learning strategies in e-learning and ways to develop them.

5.3.4 Validity and Reliability

To ensure the reliability of the data, it underwent a triangulation process, as it was examined with the help of other researchers, and how we looked at the results was discussed and given meaning. This cross-checking of the interpretations helped to ascertain the different dimensions of the study. They were thoroughly investigated and the results were trustworthy, and ultimately led to the formation of a set of interrelated groups (Marshall & Rossman, 2012).

The validity of the study analysis was also ensured by the method of analysis that ensured the theoretical saturation. This theoretical saturation is due to the existence of topics and categories, which ensures that a new category does not emerge. The description of categories also ensures that each class has been well developed in terms of its characteristics and dimensions (Strauss & Corbin, 1998). Lincoln and Guba (1985) say that there is no validity without reliability. So ensuring validity also guarantees reliability, meaning that theoretical saturation also maintains study reliability.

5.4 Research Result

The results represent the topics that emerged from the different readings of the opinions and perspectives of the interviewees as follows: the learning strategies that teachers use in e-learning, the role of learning strategies in e-learning, and the challenges facing the employment of learning strategies in e-learning and ways to develop them.

5.4.1 The Learning Strategies Used by Teachers in e-Learning

Educators in our technological age seek to develop digital learning strategies in a way that enhances learning, develops students' thinking, and increases their activity (Ismaeel & AlMylhim, 2019). This can only be done through the use of a number of learning strategies. Teachers use a variety of learning techniques when teaching students online, according to an overview of the interviews. They don't stick to a

single teaching strategy, preferring to use group learning strategies like project-based learning, problem-based learning, brainstorming, and the Jigsaw strategy. They also use individual learning strategies such as a flipped classroom strategy and educational games strategies within their virtual classroom. "I used the brainstorming strategy, the flipped classroom, the young teacher, and the Jigsaw strategy," Ruba said.

5.4.2 The Role of Learning Strategies in e-Learning

Due to its features, e-learning has become an urgent requirement imposed by various crises such as the Corona pandemic (Murphy, 2020). To be successful, these strategies must be used at the right time, with the right resources, and with the right number of students in the virtual classroom.

Learning strategies are critical for promoting students 'access to knowledge, attracting their attention, and their enthusiasm for e-learning, and evaluating the degree to which they have learned. Participants from various countries who took part in the study overwhelmingly agreed on the importance of these strategies in achieving the objectives of e-learning. Basma stressed the importance of introducing the lesson with learning strategies and evaluating the level of students' learning at the end. "I used these strategies as an introduction to the class, and I used some of them at the end of the lesson, such as digital educational games, to ensure the student understood the educational material," she said.

"Learning strategies break the rigidity of learning, transforming the lecture from silent black screens into successful and active lectures in which all students engage, but in a technical way," said Fatima from Turkey, while Salha says: "Without learning strategies, students can easily lose interest and focus." As for Ekhlas, she stresses the importance of learning strategies in increasing students' motivation toward e-learning and facilitating the access of information to students. "Learning strategies improve students' desire to learn because I use more than one strategy in class, so if they don't understand using the first strategy, they will understand using the second. As a result, the strategies used to motivate all must be varied and thus increase the student's opportunity to learn. "Both Jack and Suad stressed its importance in increasing student interaction and taking into account individual differences between them".

5.4.3 Challenges Facing the Employment of Learning

Strategies in e-Learning and Ways to Develop Them

The material, technological, and technical challenges that face the use of learning strategies in e-learning are summarized in the vulnerability of Internet networks,

power outages, the lack of learning equipment, the activation of certain digital applications on them, and the social isolation that led to a lack of student interaction during the online class, the inconsistency of the current curricula for e-learning, the inability to control students during the exams, apart from the additional burdens that were placed on the teacher's shoulders, from the computerization of all his files and work and the commitment of students to attend. Ramy summarizes the challenges he faced by saying, "The biggest challenges are turning the teacher's files and work into computerized copies, the lack of response and interaction of students in the lessons, and finding mechanisms to control cheating in exams". "We face many technical issues, and the activated educational networks have significant gaps," Ruba said of the difficulties she faced.

The lack of experience in how to use these strategies interactively through technical means and digital educational platforms, as well as in selecting the appropriate strategy for the age group and topic, was also mentioned as educational and skill-related challenges by participants. In this regard, Suad added that the challenges she faced were "searching for appropriate strategies for e-learning that stimulate students at the same time so that these strategies are appropriate for students' age and subject".

Many participants believe that the e-learning experience is recent, so it needs continuous development, by employing learning strategies that increase students' interaction, motivate them to learn, and achieve the desired goals of the educational process. Most of the participants agreed on the need to provide material and technical support to teachers, students, and parents, work to strengthen Internet networks, and conduct training courses on the use of learning strategies in e-learning. Basma said in this regard: "Internet networks in all countries must be rehabilitated". Fatima calls for the necessity of harmonizing the traditional curricula for e-learning so that the teacher can teach it in a better way. She suggests: "The traditional curricula must be adapted to digital educational contents". While Ahmed confirms that his country has provided wonderful courses, as he puts it, for teachers about the use of learning strategies in e-learning, but he wished to give workshops to students. He added, "The training courses given to teachers are wonderful, and it would be nice if the students were given workshops to develop their technical skills.

5.5 Discussion and Conclusion

The employment of a variety of active learning strategies, whether cognitive or metacognitive, is an important factor in increasing students' motivation toward e-learning (Lin et al., 2017). This is supported by the findings of the current study, which revealed that participants from various countries employ a variety of strategies to attract students' attention, increase their enthusiasm for e-learning, make knowledge more accessible to them, and assess the extent of their learning.

Learning strategies are important not only in the learning process, but they also have a direct impact on the increase in students' learning motivation, which leads to excellent results (Castillo & Cordora, 2014), which is in line with the findings of

the current study, in which the participants emphasized the importance of their role. Learning strategies increase students' motivation toward e-learning, as it broadcasts an active environment, encourages students to interact with educational content, as well as works to maintain students' attention and increase their focus so that they remain alert during the electronic session. Some participants emphasized the strategies' role in taking into account individual differences among students.

Since e-learning is recent, it is natural for teachers to face many challenges and obstacles, whether inactivating it or employing learning strategies. Teachers and students faced technological, technical, and material difficulties, which can be summarized as internet network weaknesses, power outages, a lack of required learning equipment, the activation of certain digital applications on them, social isolation that led to the lack of social contact during the electronic class, the lack of curricula harmonization with current e-learning, the ability to monitor students during tests, and the additional pressures imposed on the teacher, such as computerizing all of his files and work, and the commitment of students to attend. The results of the study also show educational and skill challenges related to the lack of experience in how to use these strategies interactively through technological means and digital education platforms, and in choosing the appropriate strategy for students' age and subject matter. Thus, the global education systems are not prepared for e-learning, and teachers are not sufficiently qualified to deal with this type of education, and the learning strategies are used that are appropriate for e-learning, as they work on the interaction of students and motivate them and raise their motivation to learn in order to achieve the goals of the educational process.

The results of the study show a variation in the challenges facing e-learning, and the employment of learning strategies in it from one country to another, as all participants agreed that there were some challenges that they faced, such as weakness in internet networks, and the lack of student interaction during classes, while the challenges increase in Palestine due to the permanent power outage. The educational platforms approved by the Ministry of Education are not fully prepared. As for the lack of experience and qualification of teachers, Turkish teachers reported that the Turkish Ministry of Education had provided its teachers with courses that provide them with adequate training to ensure the successful activation of e-learning, as is the case in Bahrain, Britain, and America, but the Turkish education system was suffering from a lack of Harmonize curricula for e-learning. While Canadian teachers were suffering from a lack of experience, and the government's inability to create a ready-made e-learning system.

Participants from different countries suggested focusing on collective learning strategies to solve the problems of social isolation that students suffer, finding mechanisms to control cheating in exams, giving training courses for teachers to activate learning strategies in e-learning, limiting the number of students in the virtual class to no more than twenty students, and rehabilitating and strengthening Internet networks in all countries.

5.6   Recommendations

1. Adopting the activation of active learning strategies in educational policies, and giving training courses to teachers on their importance and how to design and employ them successfully in the learning process.
2. Supporting teachers and students financially, technologically, and skillfully in different countries.
3. Benefiting from the experiences of successful countries in employing learning strategies in e-learning.

5.7   Limitations

The study's limitations were expressed in the participants. The small sample size, lack of comprehensiveness in many societies, and the study's restricted disciplines (only mathematics, classroom teachers, physics, business management, gifted education, English, and network security) restrict the study's generalizability to other educational contexts. More research is needed to study the impact of learning strategies on motivation toward e-learning, as more teachers from different disciplines and degrees participate in greater numbers and from more communities.

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Chapter 6
Online STEM Education and 21st Century Skills Development

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Abstract This position paper focuses on what we believe Online STEM Education that affects the development of twenty-first century skills for students. We shall briefly describe many concepts related to science, technology, engineering, and mathematics (STEM). Then we shall determine the twenty-first century skills and how to integrate into the global job market. After that, we shall clarify the role of STEM activities in providing individuals with these skills. Additionally, we shall talk about technological tools that support Online STEM activities models and determine the impact of each technological model on students' twenty-first century skills. Finally, we will conclude that STEM skills aim to prepare students for continued learning and to provide a workforce.

Keywords Online STEM education · Twenty-first century skills · Online STEM activities · Technological tools

6.1 Introduction

The current century is witnessing a group of contemporary global changes and challenges in various scientific and technological fields, modern means of communication, the explosion of knowledge and the speed of its transmission and circulation.

It has become necessary for students in the twenty-first century to possess the skills of science, mathematics, creativity, fluency in information, and communications technology. Furthermore, it is necessary for all citizens to develop the ability of applying knowledge of STEM to personal and local issues (Bybee, 2010).

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STEM stands for the four academic disciplines: Science, Technology, Engineering, and Mathematics. STEM is defined as an approach that integrates these disciplines into a cohesive learning paradigm through an instructional method (Edward, 2015). The National Science Teaching Association (NSTA) (2018) has explained that STEM education is crucial to providing citizens with the competencies to be successful in the era of technology. It also prepares students to work in the technically advanced world. In addition, it focuses on three elements: problem solving, innovation, and design which support the development of twenty-first century skills (Bybee, 2010).

STEM is implemented in classrooms by applying activities that integrate science, technology, mathematics, and engineering which enable students to investigate problems based on real-world contexts and make them productive. It has been necessary to transform STEM activities classroom to Online STEM activities. We argue that the Online STEM education should help students possess the twenty-first century skills needed to build their country and face global challenges. We will also provide examples for how the Online STEM activities develop students' twenty-first century skills**.**

6.2 Twenty-First Century Skills and Online STEM Activities

The twenty-first century skills are considered among the requirements that should be met by graduates of the current educational system, as the current generations are facing different challenges and demands from what their parents and grandparents faced, due to the change in the nature of the means of communication and the rapid increase in information and technological development, as well as the emergence of many digital devices and the change of jobs required in many fields.

Developing twenty-first century skills for students requires defining content-based curricula and pedagogical goals in education, as a result equipping students in the curriculum with twenty-first century skills is very important, and this is supported by the STEM education approach. And this will make it easier to keep pace with current contemporary changes.

Nowadays, all educational systems are seeking to meet the needs of the workforce. These systems aim to educate the individuals who can respond to the skills needed in the twenty-first century. Bailey et al. (2015) outlined sixteen twenty-first century skills and place them into three broad categories: foundational literacies, competencies, and character qualities.

Online STEM activities rely on open-source software that is characterized by creative production and focuses on the use of software engineering in integrated development environments (IDEs) in addition to the presence of a content management system (CMS). As a result, many technological tools will emerge as a digital learning environment in support of Online STEM activities. Also, modern STEM

activities included the fields of computer science, the "design world", and robotics. These broader categories reveal opportunities in the current and future workforce.

Today, employers look for graduates who possess twenty-first century skills to be flexible and perpetual learners in order to keep up with new developments. According to the statistics shown by NSTA (2018), employment in STEM occupations grew much faster than employment in non-STEM occupations over the last decade, and STEM occupations are projected to grow by 8.9% from 2015 to 2024. This could be considered as an important indication of how STEM education provides the necessary twenty-first century skills for individuals. Also, Dejarnette (2012) found that STEM activities are an attempt to develop deep scientific and mathematical foundations that students need in order to compete in the labor market in the twenty-first century. Moreover, Edward (2015) has confirmed that the aim of STEM activities is to develop a set of skills used by students in different areas of their lives, such as thinking, reasoning, teamwork, inquiry, problem solving, communication, collaboration, and creativity. From a different perspective Soland, Hamilton and Stecher (2013) talked about personal skills such as self-management, self-organization, time management, personal development, lifelong learning, and compliance as better skills than twenty-first century skills. But we see these skills are equivalent to "character qualities", which was adopted in this paper.

The researchers see that Online STEM activities can develop the twenty-first century skills among students through the following steps: first, organizing educational materials in a coherent and integrated manner that makes learning meaningful for the student. Second, presenting the scientific material according to life and scientific problems to develop problem-solving skills. Third, using project-based learning strategy and cooperative learning to develop collaborative skills among students. Fourth, taking the axis of engineering design, experimentation and working with hands during design to develop creativity and innovation skills. Fifth, using the Internet and information technology and assigning students to research through the Internet, as well as using the Internet to create social networking groups to communicate outside the school, where it develops students' communication skills. The use of computer software such as sinusoidal curve graphs and presentation of lesson summaries through the use of educational platforms and online walls, develop students' participation skills and make it the core of the educational process, as well as training students to display information and make them responsible for the results of their learning. Applying these steps guides developing the twenty-first century skills of problem solving, creative and critical thinking, collaboration, communication, information culture, media culture, ICT culture, initiative, self-direction, intercultural social skills, productivity, accountability, leadership, and responsibility.

6.2.1 Technological Tools

The technological tools and digital content (e.g. textbooks) are essential components of fostering STEM education. Technology tools can be divided into three categories:

Category (1): Technology-Supported Pedagogic Models. Kärkkäinen and Vincent-Lancrin (2013) suggested five models:

1. Gaming: they are characterized by being interactive, participatory, and collaborative (e.g. video games or virtual world environments or simulation).
2. Online labs (e.g. go-Lab, late night labs system), two types: virtual laboratory which depends on simulation using virtual equipment, and remote laboratory where the experiment is carried out using controlled material equipment.
3. International collaborative skills: it consists of collaboration through technological activities to enhance students' awareness of global problems and develop their understanding of the history and civilization of other peoples. These skills can be developed when using cloud computing, video conferencing, and online platforms.
4. Real-time formative assessment: it is a tool for real-time formative student assessment (e.g. ink survey) that enables student-instructor interaction in the style of clickers.
5. Skill-based assessment: it is an online assessment system, a computer collaboration agent, rather than a human collaboration agent.

Category (2): Orientation Tools in STEM: teachers not only used computer-based social media guidance, virtual worlds, and mobile devices as communication tools for guidance, but exceeded to include the e-monitoring of STEM students (Todd, 2013).

Category (3): OER in STEM: OER STEM Projects aim to encourage life-long learning habits of students, e.g. MOOCs and SPOCs which enhance STEM education by rapidly transferring knowledge to the participants. We represented the relationships between the technological tools supporting Online STEM activities and twenty-first century skills through (Fig. 6.1).
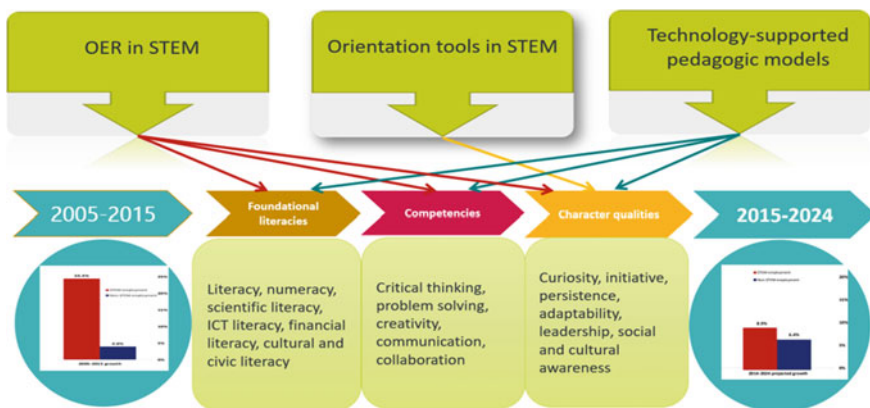

Fig. 6.1 Online STEM activities and twenty-first century skills, elaborated by authors

We conclude that the adoption of technological tools supporting STEM activities plays a major role in increasing study time and thus improving student's achievement and expanding learning opportunities. It also contributes in improving their skills, especially those of twenty-first century skills that were covered in this paper, where technology-supported models and OER develop skills foundational literacies, competencies, character qualities, while orientation tools in STEM are unique in shaping character qualities. Still, there are concerns that online learning may not be suitable for STEM classes, which require hands-on experimentation in laboratory settings. Randler and Hulde (2007) indicated that viewing experiments is not as effective a learning tool as participating in experiments, and that the process of trial and error is an important part of science and not adequately addressed in simulations. In addition, some students may experience isolation and inability to follow-up or implement the activities, then they will withdraw online. We cannot generalize these negatives in all cases. Because, we cannot neglect that todays' students have been born in love with technology. And also, there is another fact, we live in a complex society characterized by rapid access to information, existence of rapidly changing digital tools that help individuals to collaborate globally to learn effectively and live productively in the twenty-first century. Otherwise, through the attached charts with Fig. 6.1, we can notice the growth rate of employment in STEM occupations (in Red) is much faster than employment in non-STEM ones (in blue) from 2015 to 2024 (NSTA, 2018). This indicates the importance of STEM in preparing individuals for the labor market by providing them with the needed skills. On the contrary, Randler and Hulde (2007) indicated that viewing experiments is not effective as a learning tool as participating in experiments. We cannot generalize these negatives in all cases because todays' students have been born in love with technology, in addition to the fact that we live in a complex society characterized by rapid access to information with the existence of rapidly changing digital tools.

6.2.1.1 STEM Education Today

Few years ago, trends related to STEM education studies focused on single discipline, but nowadays deep studies include integration of digital technology tools with different disciplines, for example:

- Combining virtual technologies, cloud infrastructure, containers, networks, and collaborative environments to develop a new virtual lab approach to teach the basics of low-energy interactions in average x-ray settings (Corbi et al., 2019).
- Multiple-user 3D virtual worlds that have three main categories: social virtual worlds, open source and collaborative virtual worlds. It can be considered as candidate educational and technical platforms for student attendance, knowledge, achievement, skills, and digital experiences (Pellas et al., 2016).

6.3 Discussion and Conclusion

We notice that technology is predominant across many workplace fields and will continue to be even more so in the future. This paper discussed how Online STEM education develops twenty-first century skills through using activities which depend on technological tools.

These activities add value to student education via developing creative researchers, and provide them with the sufficient skills of the twenty-first century. These skills work for providing and integrating an educational environment in which the student is the core of the educational system. This result is in agreement with Saad (2020) who confirmed that the use of Internet and Communication Tools (ICT) help to gain twenty-first century skills like problem solving, critical thinking, collaboration and communication, creativity and innovation, and enhance learning, such as blogs which are one of the ICT tools that could be used along with the use of Project Based Learning (PBL) in STEM.

Nowadays using technological tools is free and available to everyone, and this allows students to use them in a way that supports their learning and develops their communication skills, as well as creative and technological thinking skills which are considered as twenty-first century skills.

The position paper outlines a set of technological tools which are divided into three categories (Technology-supported pedagogic models, Orientation tools in STEM, and OER in STEM). These tools help in designing Online STEM activities, creating integration between disciplines, and increasing students' involvement in a digital learning environment. And also, it contributes in creating a fairer future of education in science, technology, engineering and mathematics through the online courses and Open Access Education.

This paper reflects the importance of activating blended learning models, (f-to-f with e-learning), because of its effect in providing a variety of learning opportunities and customization technology that make STEM education more interesting and wonderful for students.

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Chapter 7
The Impact of Employing Google Apps in Education on Students' Achievement

Ahmad Awwad, Ashwaq Hoorani, and Amnah Abo Mokh

Abstract The main purpose of this study is to investigate the impact of employing Google Apps on students' achievement by reviewing some previous studies in this field. To achieve this purpose, two goals have been set that flow from this purpose, namely: presenting the previous studies that have utilized Google Apps in education, and determining the impact of the employment of Google Apps in education on students' achievement. The results of this study showed that there is an urgent need to use modern technological tools provided by the Internet that contribute to achieve learning goals and increase communication between faculty members and their students, this is considered as a major role in achieving education goals. Google Apps are important in facing the challenges of educational goals of the twenty-first century and that fundamental change must be directed toward the applicability of applications in teaching, research, learning, and management. And the employment of Google Apps in education has a clear impact on students' achievement and the development of new social and technical skills not available in traditional learning.

Keywords Google Apps · Education · Achievement

7.1 Introduction

E-learning is a web-based learning system that brings together multiple stakeholders along with technology and processes (Alqahtani, 2019). The usage of e-learning tools in the educational institutions has become an essential demand with the aim of qualitative improvement of educational curricula and recent teaching methods (Abdul-Munem & Ahmed, 2018), Owayid and Uden (2014) emphasize that e-learning

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permits students to learn, deepen, and progress according to their abilities, taking into account the individual differences of students in the speed of learning, it helps teachers to pursuit their students and evaluate them directly, that helps students to develop their skills. Hence, they construct their personalities in such a way that they are participants and producers of knowledge, not just recipients.

The rapid growth of digital technologies and electronic technological tools such as the usage of e-mail, e-learning, the Internet, and multimedia for educational programs is the reason behind the increase in the number of academic institutions (Kagima & Hausafus, 2001), therefore, this increase demands an increase in communication between faculty members and their students as well, this is considered a main role in achieving education goals (Baghestan et al., 2009). Nowadays, students learn about information technology that shapes their learning styles and methods (Amin, 2020).

The web era introduced many developed web applications for open and free use, such as SkyDrive, Evernote, Drop Box, and Google Apps. These web applications provide easy user interfaces and powerful functions. Moreover, teachers and students will have the technical skills needed to use these applications, and they will be more enthusiastic about using them in educational contexts (Dohn, 2009).

With cloud computing, customers do not have to purchase or own additional hardware networking equipment or worry about maintenance costs (Railan, 2012). Google Apps as a cloud computing application has become popular, and it can be used effectively in educational institutions for communication between faculty and their students as an online service, it is easy to use, reliable, useful, and fruitful to improve communication in academic institutions. Thus, Google Apps services can be considered as one of the teaching and learning tools, users can access them anywhere, anytime via the Internet (Sviridova et al., 2011).

Google Apps for education are sets of cloud-based Google Apps packages, provided free to educational institutions. For users, Google provides cloud-based server storage with Google Drive, with email functions by Gmail; Google provides institutions an administrative interface to manage their users' accounts and connect them with present campus student information systems (Brown & Hocutt, 2015). Users also have access to Google Docs for word processing, Google Sheets for spreadsheet usage, Google Slides for creating presentations, Google Hangouts for real-time video collaboration (Vouk, 2008).

As a result of the new revolution in communication devices and the Internet, the use and practice of e-learning has become a requirement all over the world (Alqahtani, 2019). Failure to use educational technologies such as Google Apps will make graduate learners irrelevant to the issues of technology in their workplace. According to the current global situation in light of the Covid-19 pandemic, and directing educational institutions to e-learning using many technological tools and techniques, the need has become urgent to study the impact of using these technological tools on education. Therefore, this study aims to know the impact of employing Google Apps in education on students' achievement through the previous studies.

7.1.1 Problem Statements

The impact of the Covid-19 pandemic on educational systems around the world in general, and in Palestine in particular, led to the closure of schools and colleges, which required the adaptation of all elements of education to continue the learning and teaching process, through the transition to a distance learning system. Many of educational institutions have relied on Google Apps, based on the fact that educational technology such as Google Apps for education can contribute in designing educational curricula that are closer to the needs and capabilities of the individual learner. All of these Apps are free and range from completely general on the web to only limited by sharing with specific contacts. Accordingly, this study focused on knowing the impact of employing Google Apps in education on students' achievement, by reviewing some previous studies and the associated theoretical literature.

7.1.2 Purpose of the Study

The main purpose of this study is to investigate the impact of employing Google Apps on students' achievement, through reviewing some of the previous studies.

7.1.3 Study Objectives

The objectives of methodical review are:

1. To present the previous studies that have employed Google Apps in education.
2. To identify the impact of employing Google Apps in education on students' achievement.

7.1.4 Procedural Definition of Terms

Google Apps: Are services from Google supplying independently customizable versions of sundry Google products under a custom domain name, a college or university can offer the functionality of Google Apps in package (and with a URL) (Asomba, 2015).

Google Apps for Education: Free Web-based email, calendar & documents for collaborative study anytime, anywhere. Google Apps for Education consist of Google Apps set, Mail, Docs, Drive, Calendar, and Sites—that offer useful and attractive options (Asomba, 2015).

Academic achievement: Is the students' achievement through quantitative and qualitative evaluations (Novo & Calixto, 2009).

7.2 Theoretical Background

7.2.1 Google Apps for Education

In 1998, Google was a new search engine, its features continued to improve until it became the most world's visited website. Later, new tools and applications were developed from Google. Included Google Apps for business, Google for Work, and Google Apps for education. The latter included promising apps for learning and teaching, and among Google's Apps for education Google Docs, Slides, Sheets, Drawings, and Forms. They are secure web applications that save data automatically with minimal chances of losing it (Strasma, 2010).

Google Apps were designed to facilitate the purveyance of the Google set of applications and other collaborative tools, such as Gmail, Google Drive, Google Sites, Google Calendar, Google Docs, Google+ , and Google Chat. To face the defiance of twenty-first-century educational objectives, a radical change should be directed toward the applicability of apps in teaching, research, learning, and colleges' management. Educational apps have been contributory in converting educational institutions. In mobile computing, for example, Android and iOS smartphone operating systems have made a massive impact and continue to alter teaching and learning in higher education (Enis, 2013).

Google's educational Apps play an important role on students' performance, especially when integrated into online learning platforms. According to research by Babson's Investigative Group, the number of students taking at least one course online increased by more than 411,000 to 7.1 million from 2012 to 2013. The report stated that the percentage of students in higher education who take at least one course was rated 33.5%. The learning process is beginning to come in line with the ever-changing technologies that are being created through distance learning and online platforms (Hodge & Harman, 2013).

7.2.2 Benefits of Google Apps for Education

Google Apps for education are easy to use relatively for most users, even those unfamiliar with Google Apps. The involvement and collaboration capabilities of Google Apps for education enable participants to improve their structural skills. Students can access the technology anytime, anyplace, sharing documents, collaboration, and commenting were the three most useful features (Brown & Hocutt, 2015).

The usage of Google Apps in education has impact on the development of basic competencies in science, technology, and mathematics for the stages of K-12, where these applications supply unique services of electronic-messaging, work, participation, and active exchange of ideas simultaneously with the same document in real time and without attachments, this is useful in working in evaluation projects, this makes students participate, learn, and think about the involvement of their colleagues according to their potential and abilities to progress, this was reflected in the achievement of students and the development of new social and technical skills not Available in traditional learning, it also puts the teacher in the real picture of students' participation in the work provided by the group, a feature offered by Google Apps through which the teacher learns about the contributions of each student to work (Railean, 2012).

7.2.3   *The Impact of the Employing Google Apps on Students' Achievement*

Albawy and Ghazi (2019) indicate that the biggest challenges that officials in the Ministry of Education face are raising the level of students' achievement. Due to the wide interest in the students' achievement, the focus of this study was on the impact of employing Google Apps on students' achievement. Among the studies that dealt with this topic is the study of Al-qahtani (2019), which he explained in his study a positive impact of the usage of Google Cloud applications (Google Drive, Google Plus, and Google Classroom) on the students' achievement, due to the advantages of Google classroom that can be used easily in educational institutions, it is completely free, and includes the e-learning's strategies based on the principle of blended learning.

Google educational applications provide the opportunity for students to search on the Internet, which opens new horizons for students and strengthens their current information, to provide them with missing information, or to clarify what is not understood, and this in turn increases their level of knowledge, skills, and academic achievement (Oyarinde & Komolafe, 2020).

7.3   Literature Review

Previous studies investigated the effectiveness of using Google apps in educational process in various subjects. Therefore, a review of previous studies is needed to get appropriate insight into the effectiveness of Google Apps. This section presents the results of the study that obtained from previous studies. This paper reviewed some studies that used Google Apps in various subjects. The results of the reviewed previous studies illustrated the impact of employing Google Apps on students' achievement. In this study seven previous studies dealt with Google Apps and

students' achievement. The results of the previous studies showed a positive impact of Google Apps on the students' achievement, and the effectiveness of using Google Apps in the educational process.

Amin (2020) conducted a study aimed to provide a general picture of previous studies during the past ten years that examined the usage of Google Apps in the process of learning and teaching of the English language. 34 studies were examined and analyzed with NVivo software. These studies covered five areas: learning and teaching English, writing, reading, speaking, and translation. The results showed the importance of Google Apps in the process of teaching and learning the English language in three areas: The researchers showed that the usage of Google Docs, Google Machine Translation, Google Speech Recognition Systems and Google Earth have had a great impact in improving English among the learners. The positive impact of Google Apps had an emotional aspects at the student level, such as motivation, attitudes, self-esteem, encouragement, pleasure, and anxiety reduction. Google Apps have advantages such as ease and benefit of use. These three aspects are sufficient to increase students' achievement.

Alqahtani (2019) conducted a study on the impact of the employing Google Apps (Google Classroom, Google Plus, and Google Drive) in education and to determine the most suitable Web-based training environment in terms of the level of usability. The experimental method was applied to a sample of 200 students from Imam Abdul Rahman bin Faisal University. Two tools were used; The System Usability Scale (SUS), and both the pre-test and the post-test to examine the knowledge of the students in the investigated course. The results showed that there was some convergence in the usability, and also showed statistically significant differences in instructional achievement in the application of Google Classroom in the educational process.

Khalil (2018) conducted a study on the effectiveness of employing Google Apps, namely Google Docs (and Google Classroom) in building a collaborative learning environment and adhering to the principles of a flipped classroom. To achieve this purpose, pre- and post-questionnaires and a semi-structured interview were used. The results of the study showed that using Google Apps contributes to achieve success and success of cooperative learning and enhancing interactions between students and between students with their teachers from the students' point of view, and students expressed their desire to employ these applications in future courses because they provide them with materials and enable them to benefit from the teacher's observation.

Albawy and Ghazi (2019) conducted a study on the impact of employing Google Classroom on the students' achievement of computer department in "image processing" topic, and their attitudes toward e-learning. The study experiment has been applied to a sample of 95 computer department students at faculty of education for pure science—Ibn al-Haitham from Baghdad university in Iraq. Over a full academic year, one day per week. Two tools were used; achievement test and direction scale for e-learning. The experimental group was taught by the "Google Classroom" method, while the control group was taught by the traditional method. The results showed a positive effect of employing the "Google Classroom" Apps on students' achievement

of the experimental group and their attitudes toward e-learning compared with the traditional method.

Oyarinde and Komolafe (2020) conducted a study on the impact of employing Google Classroom as the primary system for delivering high school online learning during COVID-19 Pandemic. The experimental method was applied to a sample of 140 students from Preston International School Akure, Ondo State, Nigeria. Two tools were used; Google Classroom Attitude Scale (GCAS) and online Semi-Structured Interview Guide (SSIG). The results showed that the Google classroom platform positively affected the academic achievement of high school students, their attitudes and perceptions during the COVID-19 pandemic. Google classroom platform helped students and teachers communicate and work together, as well as helped teachers create assignments, evaluate students, and publish educational materials. Likewise, Google Classroom has given students an opportunity to ask their questions about areas that they do not understand.

Hafour and Al-Rashidy (2020) conducted a study on the impact of storyboarding-based collaborative narrative writing by employing Google Docs on EFL students' writing fluency, syntactic complexity, and overall performance. The experimental method was applied to a sample of (30) junior students from the Faculty of Education, Tanta University in Egypt, ages of 20–21. Two tools were used; pre- and post-narrative writing tests, and students' reflection forms. The results showed a positive impact of storyboarding through Google Docs on EFL students' writing fluency, and overall writing performance with a large effect size, and the most students appreciated the storyboarding-based collaborative narrative writing activities on Google Docs and reported that they were of much benefit to them.

Alsubaie and Ashuraidah (2017) conducted a study on the impact of employing Google Docs on students' achievement in EFL contexts. The experimental method was applied to a sample of twenty-two Saudi female students in their fifth academic level majoring in Arabic language et al.-Imam Muhammad Ibn Saud Islamic University in Riyadh. Five tools were used; Participants writing portfolio, Questionnaires, Written tasks, A rubric, and Interviews. The results showed a significant increase in the students' scores using Google Docs. Further, the results were consistent as students perceived Google Docs as a useful tool for both individual and group work.

7.4 Discussion and Conclusion

The present study aimed to investigate the impact of Google Apps on students' achievement. To do so, the researchers reviewed the previous studies related to the study. Below, we discuss each one of the previous studies.

Amin (2020) study represented the results of studying the literature reviews of employing Google Apps in the learning and teaching process of the English language. The results showed that employing Google Apps and Docs developed students' learning and increased their motivation, the students have positive perceptions of employing Google Docs and Google+ inside the class. The effectiveness of Google

Docs and Google search engines in developing students' writing performance. And the impact of employing Google Forms in reducing students' anxiety in the exam.

Alqahtani (2019) in his study discussed the employment of cloud computing environments (Google Classroom, Google Plus, and Google Drive). The results showed a positive impact of employing Google Apps on students' achievement. He mentioned that the Google Apps such as Google+ and Google drive fulfilled acceptable levels and increased the students' achievement slightly. This study enthuses teachers to employ Google Apps in their daily assignments, and recommended a comparative study on students and faculties perceptions toward Google Classroom for adopting it in higher education.

Khalil (2018) study which dealt with investigating students' perceptions toward employing Google Docs and Google Classroom in creating an online collaborative environment in learning grammar. The results showed a positive impact of these Apps on students' achievement. These results were based on the students' belief that even if the teacher explained the key concepts through feedback outside of the classroom, their focus was directed to their mistakes, so, they were able to improve their grammar skills. The effectiveness of teacher's feedback through Google Docs in understanding grammatical concepts, students stated that they can understand the grammatical concepts better because the teacher can highlight the mistakes in the assignment and present a full description of why these mistakes were made and how it can be fixed.

Albawy and Ghazi (2019) study aimed to know the impact of employing Google Classroom Apps on students' achievement and their attitude toward e-learning. The results showed a positive impact of employing Google Classroom Apps on students' achievement. The Google Classroom Apps help provide a greater opportunity for students with poor achievement to facilitate their learning process and their understanding of theoretical concepts and information. The students' sense of the pleasure of studying through the Google Classroom Apps increases the sense of the importance of e-learning, which leads to an increase in the positive trend toward e-learning. The study recommended conducting a study to measure the effect of using the Google Classroom Apps on the ability to make decisions, critical thinking, and social intelligence.

Another study dealt with Google Classroom Apps was Oyarinde & Komolafe (2020) study that aimed to investigate the impact of Google Classroom as an online learning delivery platform in the secondary school during the COVID-19 pandemic. The results showed a positive effect of employing Google Classroom during pandemic. Employment of Google classroom Apps is effective in reinforcing students' self-directed learning (SDL) cognitive skills in an e-learning environment. A positive correlation between students' attitudes and the usage of Google classroom Apps, and it has contributed to the students' academic success at secondary school during pandemic. The study recommended that the future studies can comprise pretest–post-test control group quasi experimental design due to get results that are more comprehensive.

The last two studies that dealt with the impact of employing Google Docs on students' achievement (Alsubaie & Ashuraidah, 2017; Hafour & Al-Rashidy, 2020).

Hafour and Al-Rashidy (2020) study examined the impact of employing Google Docs with storyboarding-based collaborative narrative writing on EFL students' writing fluency, syntactic complexity, and overall performance. The results showed a positive impact of employing Google Docs on students' overall performance. There was an improvement in students' overall writing performance and writing fluency after being exposed to the proposed intervention. Actually, performing the computer-mediated writing tasks repeatedly enabled students to develop their writing automaticity and freer attentional capacity so that they could attend to other aspects of written production more effectively, improvements in students' overall writing performance and writing fluency could be a result of the storyboarding-based activities they practiced on Google Docs. Alsubaie and Ashuraidah (2017) study explored the impact of employing Google Docs as an online learning tool with writing skills outside the classroom. The results showed a positive impact of employing Google Docs on students' achievement. The researchers illustrated that Google Docs can enhance learning writing positively outside the classroom. Students interacted through the comment sections and accepted the feedback more than the face-to-face feedback. The majority of the participants rated their experience with Google Docs helpful and useful.

According to the results of the studies mentioned in the theoretical literature, several studies (Baghestan et al., 2009; Kagima & Hausafus, 2001) concluded that there is an urgent need to use modern technological tools provided by the Internet that contribute to achieve learning goals and increase communication between faculty members and their students, as this is considered a major role in achieving education goals. Both (Enis, 2010; Strasma, 2013) see Google Apps as critical in facing the challenges of the educational goals of the twenty-first century. Fundamental change should be directed toward the applicability of applications in teaching, research, learning, and management, because the educational applications have brought about positive change in education and teaching. Also, the usage of Google Apps in education has a clear impact on students' achievement and the development of new social and technical skills that are not available in traditional learning (Alqahtani, 2019; Hodge & Harman, 2013; Railean, 2012), they concluded that Google Apps put the teacher in the real picture of the student's participation in the work that he presents in the work group.

The implications concluded from the results support the impact of employing Google Apps on students' achievement. These Apps can be used as online learning tools and blended learning practices. Teachers have an excellent opportunity to use these applications in education. Teachers can explore and create more ideas for a better learning experience (Leem & Sung, 2019). Learning can be achieved in the twenty-first century, through more modern approaches that develop and are in line with the skills and technological requirements of the twenty-first century. Educators, and parents play an important role in ensuring that Google Apps are used in education. Although this study highlighted the impact of employing Google apps on students' achievement. It is important to perceive that the study has limitations. This study was based on reviewed the previous study only, without applying it to a sample of students. This review may be an introductory guide to research in the field of

e-learning applications such as Facebook or WhatsApp, including Google Apps in teaching and learning processes, and may enable researchers to know their impact on the pillars of the educational process as a whole.

7.5   Recommendations

1. The necessity of working to educate the parties to the educational process about the role that Google Educational Apps can play in serving the educational process and its impact on increasing students' achievement.
2. Providing computers and internet service in universities and schools to enable students to use Google Apps in the educational process and to provide an appropriate educational environment.
3. Training students in Universities and educational institutions to use educational Google Apps in the educational process.
4. Official accreditation for the usage of educational Google Apps in Universities and schools in the teaching curricula to keep pace with recent trends in the use of e-learning methods and cloud computing technology.
5. Develop plans to adopt e-learning in educational institutions and expand the usage of cloud computing technology in the educational process.
6. Holding training courses and workshops for teachers in universities in order to train them on how to use educational Google Apps in the educational process.
7. Conducting more research on the usage of educational Google Apps and its impact on increasing the academic achievement of students in Universities and schools in various courses.

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Chapter 8
The Importance of the Lesson Plan Elements in Education and Teachers' Practices of Them

Mahasen Sehweil, Samira Mahmoud, and Mai Jeidi

Abstract Lesson planning is a crucial element of constructive teaching–learning process supplying the teacher with a coherent framework of teaching and assisting with the smooth flow of the lesson. It can be considered as a teacher's road map of what students ought to learn and how it will be done effectively during the class time. The objectives of this study are to find out to which extent teachers apply the design elements of the lesson plan and to investigate their perceptions of the importance of these elements. Descriptive design with a quantitative approach was used in order to achieve these objectives, involving teachers in public schools in Ramallah, Qalqilya, and Tulkarem directories in the scholastic year 2020–2021, and a random representative sample was chosen to answer a questionnaire, which was developed based on review of the literature, and included (30) items which were distributed into two domains. Results showed that teachers apply the design of the lesson plan and their perception of the importance of the lesson plan is high. Moreover, there was no statistically significant differences in teacher's practices and perception according to gender or experience years. While there were a statistically significant difference in their perception according to academic qualification, teacher who has educational qualification certificate was significantly higher than those who haven't. Our result suggests the necessity for teachers to obtain educational qualification certificates.

Keywords Instructional design · Lesson plan · Elements of lesson plan · Teacher practices

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8.1 Introduction

The seek for the understanding of the learning and the teaching processes leads to instructional design, which is a field of study related to describing theoretical principles and practical procedures of how to prepare school curricula, educational projects, and lesson plans in a manner aimed at achieving the set goals (Edgar, 2012). It is thus considered a science related to the methods of planning the educational process in form of plans before starting to implement them.

One of the main characteristics of any educational program is that it has a clear and good plan. The daily lesson is considered one of the most important, which was of interest to educational researchers who emphasized its importance in the success of the educational process (Sahin-Taskin, 2017).

The educational lesson plan is a part of the annual general planning, and responsible for organizing the teachings of each subject during the corresponding educational period, it consists of a number of elements, the basic elements of any a lesson plan must be having, basic competencies, learning material, learning activities, evaluation, and educational strategies (Anaktototy et. al., 2020).

This study aims to find out how well teachers apply the design elements in the lesson plan and to check teachers' perceptions of the importance of instructional design elements. More specifically, the research poses three questions:

- How well do teachers apply the instructional design elements in the lesson plan?
- WHAT perceptions of teachers about the importance of instructional design elements?
- Are there statistically significant differences in teacher's application and perceptions of the importance of designing education according to demographic variables?

This study deals with an important topic in education which is instructional design and its great role in facilitating the education process for the teacher and the students. Therefore, research on this topic will add a theoretical aspect that educators can benefit from in improving the educational process. Also, it will help in evaluating teachers' application of the elements of instructional design, and identifying their weaknesses in the future, as the study will present a number of recommendations for those interested in the educational field that help in evaluating teachers' practices in designing the daily lesson plan.

Although many studies have dealt with the subject of educational design and the importance of educational design elements, but we did not find a recent Palestinian study that examined teachers' perceptions about the importance of educational design elements in the lesson plan, through which the elements of the lesson plan can be conceptualized.

8.2   Theoretical Background

8.2.1   The Instructional Design

8.2.1.1   The Importance of Instructional Design

The origins of instructional design go back to research in the fields of psychology and education, which provided much of the knowledge and skills needed to develop educational strategies and techniques. Druzeh (2021) defines instructional design as: "A field of study related to the development of a detailed and studied plan for the material that includes a description and procedures for each of the educational goals, external conditions related to the elements of the educational situation, and internal conditions related to the characteristics, educational content, goals and behaviors, teaching strategies, formative and collective evaluation processes.

Instructional design is important in directing attention toward educational objectives, saving time and effort, increasing the teacher's chances of success in teaching the subject, facilitating interaction, communication and coordination among the members, evaluating the student learning and teacher work, reducing the tension and confusion that may arise among teachers from following randomized instructional methods, providing the teacher and the learner with a learning environment based on high technological foundations, helping the learners gain high professional competencies, providing the teachers with instructional design models guide them in designing the teaching material, developing teaching and learning processes (Gawlik-Kobylinska, 2018; Ozdamli & Ozdal, 2018; Philip, 2018).

8.2.1.2   Participants in the Design Process

Four people participate in instructional design process: Teaching designer, subject specialist, the evaluator, and the teacher for whom and with whom the teaching plan was drawn up. Because of his knowledge about learners, activities, procedures, the curriculum, which enables him to implement the details for a large number of planning elements and to test the developed teaching plan, whether it is related to designing curriculum or lesson plan (Matić, 2019).

8.2.2   Lesson Plan

The teacher's role has evolved from a transmitter of knowledge to a learning designer, so it has become a fundamental for the teacher to design, manage: learning environment, curriculum, time, activities, strategies, the evaluation, and adapt educational resources that suits students' backgrounds and characteristics (Matić, 2019). The

lesson plan is defined as the document written by the teacher explaining the planning processes for the lesson (Hejji Alanazi, 2019), in which he puts his ideas into a written template within a specified time frame that requires good educational knowledge, creative ideas in teaching and skills in critical thinking (Sahin-Taskin, 2017). Preparing a lesson plan is not an easy process, it needs good training and qualification, (Hejji Alanazi, 2019).

With the great technological progress, several computer programs support the lesson planning (Strickroth, 2019). So, teachers need to develop their skills in using technology, and take advantages of the technological programs to support their planning, especially in crises, like the Covid-19 crisis, where education transformed into distance learning. Developing a lesson plan makes it meaningful, it needs to be developed from year to year and from class to another, to suit the students' characteristics and the surrounding conditions (Douglas, 2015). Also, the teacher can change and modify his plan during teaching according unexpected events, whenever necessary in the classroom (Zeng, 2018). The lesson plan passes through three main stages, namely: introduction, core, closing; the introduction includes introductory activities to stimulate students' motivation, inform them of the lesson objectives and link the new lesson with previous experiences of the students; the core includes activities, the presentation, students' discussions and inquiries, then the closing activities, which include making a summary of the lesson and a final evaluation, which facilitates the sequence of the lesson activities, and helps in presenting the lesson according to a logical scenario (Fouryza et al., 2019).

The elements of the lesson plan are: assessment, duration, objectives, activities, strategies and learning outcomes (Burgul Adiguzel, 2021). In addition to students' previous experiences, competencies, and materials (Hejji Alanazi, 2019), we must take the lesson plan as a whole, taking into account all its elements, and pay attention to the harmony between these elements, which gives the plan good quality and consistency between its elements (Burgul Adiguzel, 2021). Various templates are used to link the lesson plan elements with each other (Martin, 2011). Teachers are free in choosing lesson plan template, but they must follow the general principles of lesson planning, which focus on the way to achieve the goals of the curriculum (Nurtanto, 2021).

8.2.2.1 Elements of Lesson Plan

Competences

Competence is the ability of doing job, successfully and effectively, and include the combination of knowledge, skills, attitudes, values and one's life experiences (Kim, 2019; Kulik et al., 2020). It is impossible to develop students' competence without paying attention to developing their learning environment, by analyzing its elements, predicting threats, opportunities, weaknesses, strengths, and investing its resources: curricula, teachers, students, materials, teaching strategies, evaluation. Competencies are divided into: core competencies and technical competencies, the

core competencies have been classified into three groups: personal competencies, social competencies, and tool competencies (Kim, 2019). The teacher can develop the personal competencies through activities that enhance skills of creative thinking, problem solving, and self-learning and he can build up social competencies through the activities of cooperative groups and stimulate communication between students through various channels. While tool competencies can improve through enhancing computer use.

Lesson Objective

A lesson objective are teacher determinations of what he wants and expects the students to acquire from specific educational curriculum, and to achieve within a specific period of time, this can be measured using different evaluation tools (Clark et al., 2020). The lesson objectives should be applicable, specific, and measurable, on the other hand, they must have basic elements; the final behavior which is expected to achieve by the student, the content, the learning condition and performance criteria (Msaedeh, 2018).

Teachers sometimes are confused between learning goals and learning objectives. Learning goals have a purpose related to the curriculum as a whole, and therefore it takes a long period of time to achieve, and it cannot be measured, while learning objectives are related to lessons or units, can be measured and the period of achieving them is relatively small (James, 2020). Bloom has classified learning objectives into three domains: cognitive domain which is related to mental skills; psychological domain which related to psychomotor skills; emotional domain that contains interests, trends, tendencies. He also classified cognitive domain into six levels: remembering, understanding, applying, analyzing, synthesizing, and evaluating (Msaedeh, 2018).

Learning Outcomes

Learning outcomes define what students should be able to demonstrate, know and do after completing the lesson, it can be formulated by referring to the lesson learning objectives (Clark et al., 2020). Learning outcomes are arranged in four levels: knowledge, comprehension, application, invention. Good learning outcomes must meet the SMART criteria; Specific, Measurable, Achievable, Relevant, and Timed (Solikhah & Budiharso, 2019).

Evaluation

Evaluation is an important element in the development of educational processes, it is the tool that measures the level of educational processes, to make a judgment on the quality and suitability in achieving the learning objectives (Mohammadi, 2021).

Technological advancement shifted the evaluation from the traditional evaluation to the alternative evaluation such as performance and realistic evaluation, portfolio, and others, which concerned with the use of higher thinking skills, solving problems, creating positive trends toward work, achievement, and creativity (Bland & Gareis, 2018).

Educational Tool

The educational tool defined as a tool that helps the student understand the concepts of the educational material, visualize abstract concepts into perceptions. Teachers can create educational tools, or modify them according to the concepts they teach and manufacture at a reasonable cost (Priyambodo & Wulaningrum, 2017). The nature of educational tools has been affected by technical developments, and the use of them posed in a challenge because teachers need skills to use them in an effective manner (Lombillo Rivero et al., 2012).

Learning Activities

Teachers should design rich lesson activities such as laboratory, simulation, science trip because they can help engage students in their learning, present good outcomes and achievement, and develop lifelong skills, increase students' motivation, change their behavior for the better, and increase their deep understanding of content (Achinewhu-nworgu & Achinewhu-nworgu, 2020).

Educational Strategy

Teachers use educational strategies to achieve educational goals, educational strategies should be changed due to the technological advancement and the scientific explosion (Seechaliao, 2017).

Reflection

Reflection is a review on what the teacher teaches and students learn, with the intention to improve it. Reflection helps the teachers in documenting their educational experience and providing suggestions for improving their skills continuously (Chang, 2019). The teacher must do reflection at the end of each lesson, and pay attention to its parts that happen during the reflection process, which are the reflection about the teaching experience and the analysis of all elements of the teaching experience including, and the impressions and feelings that were generated from the situations that teacher faced in his educational experience, whether they were positive or were negative (Tiessen, 2018).

8.2.2.2 The Importance of the Lesson Plan

Successful teaching process starts from successful planning, effective teaching requires effective planning with high accuracy and with great interest. Lesson plan can help teacher recognize and understand the needs of his students, integrate them in planning, prepare an effective learning environment for teaching students effectively, manage the lesson activities and time, evaluate the curricula and the teaching process, make a bridge between the theoretical and the practical side, progress in the educational material in an orderly manner, schedule the curriculum, increase the teacher's self-confidence, make the lesson easier, and predict problems that may occur, stimulating students' skills, and provide them with specific personal and social competencies (Burgul Adiguzel, 2021; Hejji Alanazi, 2019; Sahin-Taskin, 2017).

Preparing the lesson plan in consistency with teaching strategies, helps students develop their ways of thinking and life skills (Kim, 2019), and assist students focus on the most important information contained in the content (James, 2020).

8.2.2.3 Teachers' Practices of Lesson Planning

Burgul Adiguzel (2021) indicates that teachers' practicing of the lesson plans should be moderate in terms of process, language use, activity, method and technique use, but the shortcomings in the lesson plans appeared in identifying too many learning outcomes to cover in the time available, preparing activities for all the learning outcomes. Bland and Gareis (2018) see that teachers pay great attention for performance assessments because they can develop a task or product, necessitate subjective judgment to measure students' abilities to demonstrate knowledge, skills, and processes in a way that provides value, interest, and motivation to students beyond the actual score or grade. Chang (2019) indicates that teachers attempt to improve the reflection on lesson plan since it influences their learning experience, increases their awareness of their thoughts and actions, refines, develops, and enhances teaching skills. As for Hejji Alanazi (2019), he sees that teachers spend more time on designing lesson plans, especially planning materials, so teachers focus on creating learning objectives which create more meaningful learning experiences, enable students to become more effective and efficient researchers, and help the lesson become student-focused and assessable (James, 2020).

8.3 Methodology

Descriptive research design was taken in this study by random representative sample, consisted of 166 teachers in public schools in Tulkarem, Qalqilya and Ramallah directories, in the scholastic year 2020–2021. Researchers developed a questionnaire based on review of the literature, which consists of two parts. The first, includes demographic variables: gender, educational qualification, years of experience, the

educational stage taught by the teacher, the teacher has an educational qualification certificate. The second, included (30) items distributed into two domains: teachers applying the lesson plan elements in their practices and their perceptions of the importance of lesson plan elements. These items were examined by using a five-point Likert-type.

The validity of the first-version of the questionnaire was examined by (4) experts working in educational science institutions, and the necessary modification was made. The Cronbach Alpha reliability for the two domains was 0.89, 0.90 respectively, and it is an acceptable level of reliability.

8.4 Data Analysis and Finding

8.4.1 Descriptive Statistics of Teachers Responses for Applying and Perceptions of the Importance of Lesson Plan Elements

Descriptive statistics of the teacher's responses toward applying the lesson plan elements in their practices and their perceptions of the importance of lesson plan elements, is shown in Table 8.1.

According to Table 8.1, teachers had higher mean in applying the lesson plan elements in their practice than the mean in their perceptions of the importance of lesson plan elements. The result of the descriptive analysis for the eight elements of the lesson plan showed that, for the two domains: the highest mean for the lesson plan information and the lowest mean for reflection on the lesson.

Table 8.1 Descriptive Statistics for applying and perception of lesson plane

Domain		N	Minimum	Maximum	Mean	Std. Deviation
1	Teachers apply the design elements of the lesson plan	166.0	2.00	5.00	3.89	0.50
2	Teacher's perceptions of the importance of lesson plan	166.0	2.00	5.00	3.88	0.47

8.4.2   Comparison of Teachers Responses for Applying and Perceptions of Lesson Plan Elements by Gender

To examine the difference between male and female teacher's responses toward applying the lesson plan elements in their practices and their perceptions of the importance of lesson plan elements a descriptive analysis was conducted, the result showed that, the mean score of male teachers exceeded 0.13 and 0.52 than that of female teachers in teachers applying the design elements in the lesson plan in their practices, and their perceptions of the importance of instructional design element respectively. An independent sample t-test was conducted to determine whether these differences were significant or not. The result indicated no significant differences between males and females in applying the lesson plan elements in their practices domain (t (164) $= -1.41, p = 0.15$), perceptions of the importance of lesson plan elements (t (164) $= -0.55, p = 0.10$).

8.4.3   Comparison of Teachers Responses for Applying and Perceptions of Lesson Plan Elements by Academic Qualification

To investigate the difference in applying and perception of lesson plan element for each domain by academic qualification, descriptive statistics were made. As mentioned in the result, generally the mean score of teacher's responses for applying and perceptions of lesson plan elements was different according to teacher academic qualification. One-way ANOVA used test if there is a significant difference in the mean score of teacher's responses for applying and perceptions of lesson plan elements by academic qualifications variable. There were no statistically significant differences between group means determined by one-way ANOVA in applying teachers the lesson plan elements in their practices (F (2,163) $= 2.59, p = 0.08$), while there are statistically significant differences between group means in their perceptions of the importance of lesson plan elements (F (2,163) $= 4.47, p = 0.01$). To obtain more detailed information in each educational qualification for teacher's perceptions of the importance of lesson plan elements, a post-Hoc test was executed by the Tukey HSD method as shown in Table 8.2.

According to Table 8.2, teachers with Master degree or more were significantly higher in their perceptions of the importance of lesson plan elements than both teachers who have Diploma or BA degree. But Diploma or BA degree teachers were not different in their perceptions of the importance of lesson plan elements.

Table 8.2 Result of Tukey (HSD) for teacher's perceptions of the importance of lesson plan elements among three selected academic qualification

(I) Academic qualification	(J) Academic qualification	Mean difference (I–J)	Sig.
Diploma	BA	−0.03	0.97
	MA or more	−0.29	0.19
BA	Diploma	0.03	0.973
	MA or more	−0.25[*]	0.01
MA or more	Diploma	0.27	0.19
	BA	0.25[*]	0.01

8.4.4 Comparison of Teachers Responses for Applying and Perceptions of Lesson Plan Elements by Number of Experience Years

To investigate the difference in applying and perception of lesson plan element for each domain by number of experience years, a descriptive statistic mentioned generally the mean score of teacher's responses for applying and perceptions of lesson plan elements was different according to number of experience years. A one-way ANOVA used to test if there is a significant difference in the mean score of teacher's responses for applying and perceptions of lesson plan elements by number of experience years variable. There were no statistically significant differences between group means as determined by one-way ANOVA in: applying teachers the lesson plan elements in their practices (F (163, 2) = 0.08, p = 0.99), and teachers' perceptions of the importance of lesson plan elements (F (163, 2) = 0.22, p = 0.80).

8.4.5 Comparison of Teachers Responses for Applying and Perceptions of Lesson Plan Elements by Educational Stage Taught by the Teacher

To investigate the difference in applying and perception of lesson plan element for each domain by educational stage taught by the teacher, descriptive statistics mentioned, generally the mean score of teacher's responses for applying and perceptions of lesson plan elements was different according to educational stage taught by the teacher. A one-way ANOVA used to test if there is a significant difference in the mean score of teacher's responses for applying and perceptions of lesson plan elements by educational stage taught by the teacher variable. There were a statistically significant differences between group means as determined by one-way ANOVA in: applying teachers the lesson plan elements in their practices (F (162, 3) = 3.79, p = 0.01), and teacher's perceptions of the importance of lesson plan elements (F (163, 3) = 3.86, p = 0.01)). To obtain more detailed information for each domain, a post-Hoc test was executed by the Tukey HSD method. The result showed, that the mean value

of teacher's perceptions of the importance of lesson plan elements was significantly different between teachers with Master degree or more and teachers with BA degree ($p = 0.01$, 95% C.I. $= [-85.3, 85.8]$). While there was no statistically significant difference in mean scores between teachers with Master degree or more and Diploma ($p = 0.19$) or between teachers with BA and Diploma ($p = 0.97$).

8.4.6 Comparison of Teachers Responses for Applying and the Perceptions of Lesson Plan Elements by Posing the Teacher Educational Qualification Certificate

To examine the difference between teacher's responses toward applying the lesson plan elements in their practices and their perceptions of the importance of lesson plan elements according to posing educational qualification certificate a descriptive analysis was conducted, the result showed that, the mean score of teachers has educational qualification certificate exceeded 0.0.25 and 0.22 than that of teachers haven't educational qualification certificate in applying the design elements in the lesson plan in their practices and their perceptions of the importance of instructional design element respectively. To determine whether these differences were significant or not, the independent sample t-test was conducted. And the result indicated a statistically significant differences between teachers according to posing educational qualification certificate in the two domains: applying the lesson plan elements in their practices domain (t (164) = 2.09, $p = 0.004$), and perceptions of the importance of lesson plan elements (t (164) = 3.46, $p = 0.001$). Also, teachers who have educational qualification certificate were significantly higher than teachers who haven't.

8.5 Discussion and Conclusion

This study aimed to find out the extent to which teachers apply the design elements of the lesson plan and to investigate teachers' perceptions of the importance of these elements. According to descriptive statistics, the teacher's responses for applying the design of the lesson plan and the importance of its elements in education was high, this means that Palestinian teachers, are aware of the importance of the lesson plan in improving education, therefore they care about their lesson plan practice to be good. This result agrees with the results of (Bland & Gareis, 2018; Hejji Alanazi, 2019; James, 2020; Sahin-Taskin, 2017) and disagree with results of (Burgul Adiguzel, 202).

Also, the results of the study showed that teachers with Master degree or more were significantly higher in applying the element of lesson plan than the teachers who have Diploma or BA degree. Most of teachers with a Master's degree or higher in

Palestine are specialized in the field of education, so through what they have learned they realize the importance of these elements during planning.

While, teachers teach secondary stage significantly higher in applying the elements of lesson plan than teachers who teach low primary stage. Teachers believe that lower primary stage has easy content and students are of a young age group, so that teaching in lower primary stage does not need a lot of effort, as in the upper secondary and high primary stage. The result that related to the teachers who have educational qualification certificate were significantly higher in applying the element of lesson plan who haven't. Teachers with a pre-service or in-service educational qualification, certificate learn about teaching and learning theories, in addition to the foundations of education planning. Finally, teachers are interested in preparing a good lesson plan and realize the importance of this in improving education, so it is necessary for teachers to keep abreast of developments in design science and follow their practices in building their plans.

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Chapter 9
The Role of an Instructional Design Model Integrated with OERS in Developing Teachers' Competencies to Adopt E-Learning

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Abstract The current chapter includes a paper aims at developing an instructional design model integrated with OER's and examining its role in developing Palestinian teachers' professional competencies in adopting e-learning. To achieve this aim, an instructional design model named GHOSHEH ID Model was developed. Accordingly, teachers got a special training to apply the model in designing e-content and delivering it to learners online. Three instruments were used: First, a case study with a group of technology teachers who were trained to apply the model with students. Second, a questionnaire answered by teachers to evaluate the model. Third, a focus group of teachers who applied the model. Analysis of data revealed that applying GHOSHEH ID Model contributed effectively in developing teachers' professional competencies in adopting e-learning due to integrating OER's with instructional design and multiple learners centered strategies in parallel to continuous assessment and authentic evaluation. Accordingly, the researchers recommended adopting GHOSHEH ID Model in designing e-content and applying it.

Keywords Open educational resources · Instructional design model · Teacher competencies · E-learning

9.1 Introduction

Covid-19 is a virus that affected different aspects of life worldwide, mainly education; education suddenly shifted from face-to-face to e-learning challenging different countries, especially developing ones including Palestine that was stuck with the unplanned shift, due to the lack of infrastructure and instructional design of the

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e-content leading to disappointing quality of learning (Khlaif & Salha, 2020). Moreover, teachers had limited prior experience in e-learning, and lack of professionalism to apply e-learning.

Professionalism is measured by professional competencies related to the teachers' demands (Wardoyo, Herdiani, & Sulikah, 2017). These competencies address attitudes, values, knowledge, and individual skills (Tapani & Salonen, 2019), associated with adapting appropriate pedagogies. It also concerns to content and technological competencies such as planning, developing activities, and learning resources to achieve learning objectives, integrating technology into education.

Professional competencies also relate to supporting student during learning and assessment, managing classroom and providing an attractive and safe learning environment for students (Kopish, 2017; Wardoyo, Herdiani, & Sulikah, 2017). In addition to designing accurate and engaging online e-content, using technology to enhance learning, applying media, choosing relevant resources, employing effective strategies, and designing activities that lead to the best learning and collaboration, providing proper feedback, organizing discussions, monitoring progress, and assisting learners with technical issues (Quiroz, Ritter, Newton, & Palkar, 2016). Professional training programs is vital to develop teachers' competencies (Abu-Moghli & Shuayb, 2020) including knowledge of subject matter, pedagogical skills, and assessment (Kim, 2018; Kopish, 2017; Panda & Santosh, 2017; Stracke, 2019).

Open educational resources (OERs), relate to free learning, teaching, or research materials that promote lifelong learning by sharing them publicly to be used, reused, revised, remixed, or redistributed freely in order to benefit and empower learners despite of different barriers (Conole & Brown, 2018; Lambert, 2018; Urbancic, Polajnar, & Jermol, 2019). OER's provide a space to develop teachers' pedagogical skills, like supporting active learning, motivating students, and promoting learning communities (Paskevicius & Irvine, 2019). Adding that, OERs provide opportunities to develop teachers' digital literacy and open educational practice (OEP) which promotes individuals' innovative thinking and building knowledge and notions to assist the open digital world (Conole & Brown, 2018). Accordingly, OERs help teachers assist learners to contribute meaningfully by sharing their assignments as new OERs all over the world (Al Abri & Dabbagh, 2019; Conole & Brown, 2018; Van & Katz, 2019). Despite of the OER's merits, teachers have negative attitudes toward using OER's in teaching; due to the poor infrastructure, and lack of appropriate training programs that raise teachers' awareness toward the benefits of employing OERs (Baas, Admiraal, & van den Berg, 2019; Fandiño &, Yamith, 2012; Orwenjo & Erastus, 2018). Therefore, educators proposed such training programs that assist teachers to develop instructional materials and practice learning design (Conole & Brown, 2018; Paskevicius & Irvine, 2019).

Professional training programs are expected to provide teachers with clear insights about the sequence of the OERs implementation in education within different contexts using appropriate technologies in teaching any content (Baas, Admiraal, & van den Berg, 2019). However, if these training programs lack either the appropriate models of instructional design or experts' assistance in instructional design, it is more

likely to miss the alignment between assessments and learning objectives (Quiroz, Ritter, Newton, & Palkar, 2016).

Instructional design serves teachers to support analysis skills, innovate instructions, develop contents that support OERs implementation (Ren, 2019). Meanwhile, it is more effective to design the training programs with the same instructional design models that develop teachers' technological and pedagogical competencies specifically e-learning content (Quiroz, Ritter, Newton, & Palkar, 2016).

Instructional design (ID) aims at developing an effective training program, by assisting teachers to use models with systematic planning, instructional development, and increasing efficiency ending with facilitating students' learning (Khalil & Elkhider, 2016). During COVID 19 emergencies, there was a need for an ID model that enables teachers to benefit from OERs to design e-content and deliver it to learners. As a result, Dua' Ghosheh Wahbeh, the first author, developed an ID model integrated with OER's, which named (GHOSHEH ID MODEL), then the researchers evaluated this model regarding to its role in enhancing teachers' competencies in adopting e-learning.

The current chapter includes more details about (GHOSHEH ID Model) in addition to a study conducted by the authors to explore the role of GHOSHEH ID Model in developing teachers' competencies in adopting e-learning.

9.2 GHOSHEH ID Model

GHOSHEH ID Model was developed after studying literature and investigating the Palestinian teachers' needs in emergencies. Ghosheh also depended on her experience in instructional design and e-learning for more than 11 years to develop the model shown in Fig. 9.1.

As shown in Fig. 9.1, the first letter of each step of the model formed the word GHOSHEH from which the name of GHOSHEH ID Model was derived.

9.2.1 Theoretical Foundation

GHOSHEH ID MODEL based on the following theories.

9.2.1.1 Cognitive Constructivist (Piaget)

Cognitive constructivist perspective based on Piaget's theory of cognitive development and learning; Firstly, learning is accumulation of previous and new knowledge which may lead to disequilibrium state of cognition. Accordingly, individuals try to
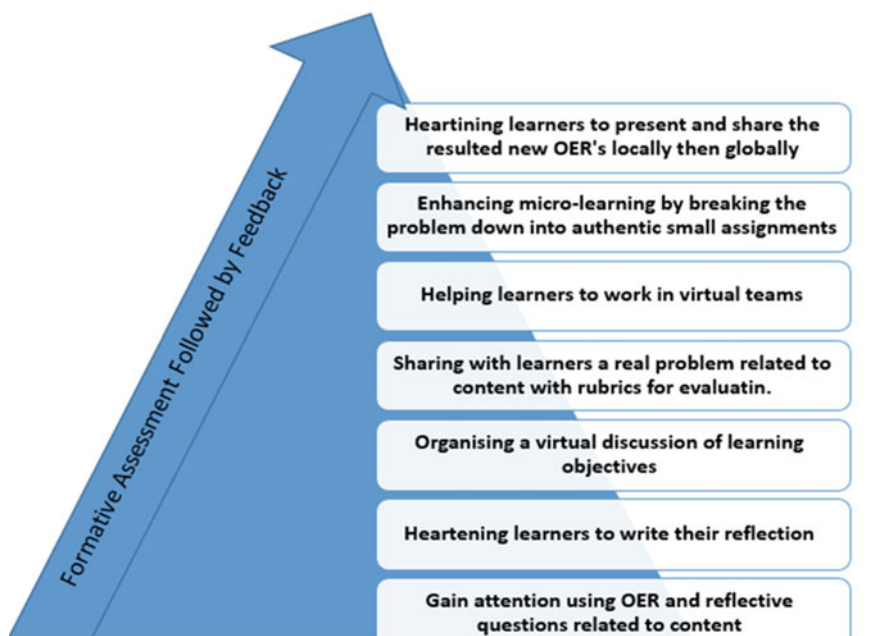
Fig. 9.1 GHOSHEH ID model

make sense of their knowledge to achieve equilibrium and assimilate the new knowledge (Khalil & Elkhider, 2016). Secondly, the model is considered as constructivist since it enables learners to reflect and create new OER (Feldman, 2004).

9.2.1.2 Sociocultural Theory (Vygotsky)

GHOSHEH ID Model depends secondly on the sociocultural theory (Vygotsky, 1978) which focuses on the role of social interactions in learning considering the concept of Zone of Proximal Development (ZPD) believing that learners do better with some help of peers or teachers' scaffolding. The model demands dividing students into virtual teams to support others and share experiences, in addition to teachers' scaffolding and continuous assessment.

9.2.1.3 Systematic Approach of Instructional Design Theory (Gagne)

The model relates to Robert Gagne's theory that contributes to the systematic approach of instructional design and the information processing model of the mental events when stimulating learners while focusing on the learning outcomes achieved by specific instructional events. Gagne who is considered as cognitivist, proposed
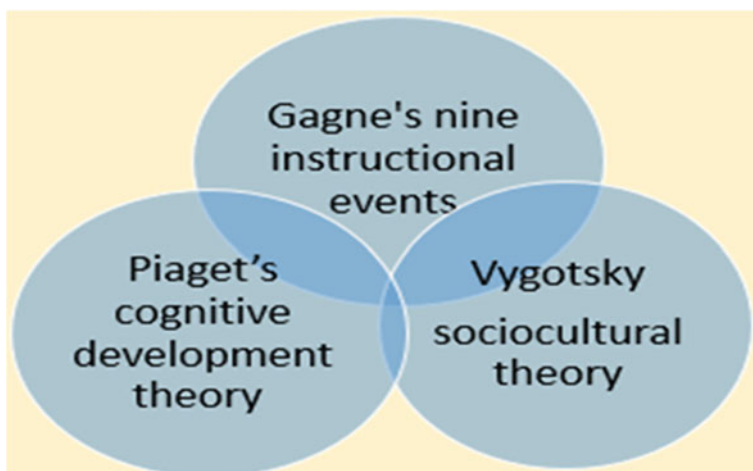
Fig. 9.2 Integrations of theories that form GHOSHEH ID model

nine instructional events, cascaded beginning with gaining attention, and ending with assessing the learners' performance and enhancing retention and transfer (Khadjooi, Rostami, & Ishaq, 2011). GHOSHEH Model based on some of Gagne's nine instructional events and associated them with context. The resulted model integrated the three theories as shown in Fig. 9.2.

Relying on theory, the model integrates different strategies aiming to help learners construct new experiences, in addition to conduct reflection, authentic assignments, and continuous formative assessment as shown in Fig. 9.3.

Figure 9.3 presents that GHOSHEH ID Model benefits from the potential of OER's, cooperative learning and problem solving that contribute to the development of entrepreneurial and life skills, including professional, personal, cognitive, self-directed, time management skills, critical thinking, teamwork, communication, and mutual respect (Sungur & Tekayya, 2006). The model also provides rubrics of cooperation with students to evaluate their performance, which contributes to developing students' metacognitive skills and controlling their self-control of learning (Earl & Katz, 2006).

The model focuses on reflection in learning and the procedures at the beginning of each lesson, starting from describing an OER, then gradually asking each student to write a reflection and express feelings and attitudes toward OER. This reflection contributes to deepening learners' knowledge, identifying strengths in what they have learned, points that need to be developed, thus leads to self-assessment, and personalized learning (Chang, 2019).
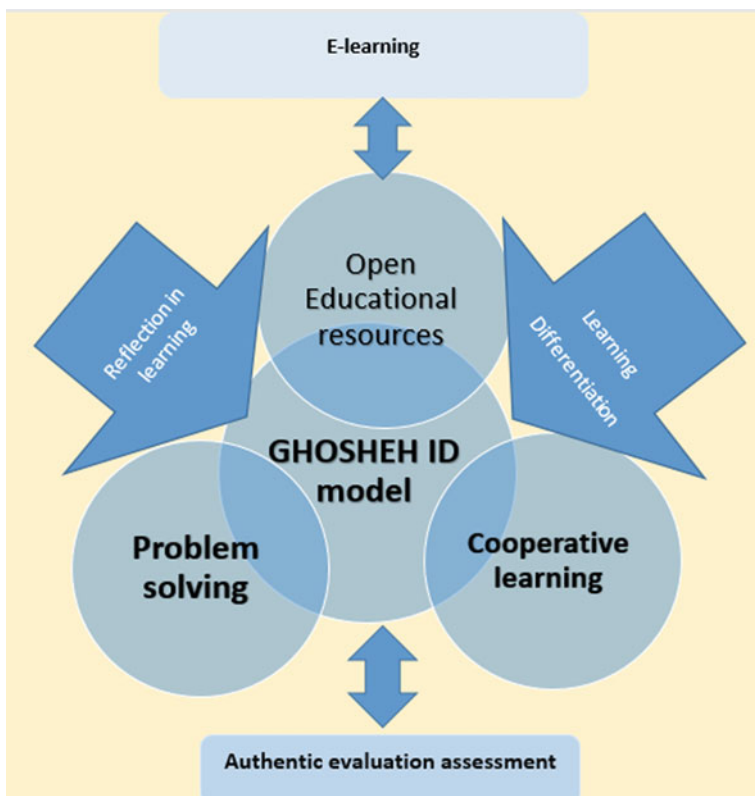
Fig. 9.3 Strategies and approaches of GHOSHEH ID Model

9.2.2   Evaluation of the Model

To evaluate the role of (GHOSHEH ID Model) in developing teachers' competencies in adopting e-learning, the authors conducted a study aiming to examine its role after applying the model within a professional training program that integrates teachers training with instant application with learners.

9.2.2.1   Questions of the Study

The study tried to answer the following main question: What is the role of (GHOSHEH ID Model) in developing Palestinian teachers' professional competencies in adopting e-learning?

This was achieved by answering the following sub-questions:

How did teachers apply GHOSHEH ID Model in designing technology e-lessons and delivering them?

How did teachers who applied GHOSHEH ID Model evaluate it?

9.2.2.2   Method

The study was conducted by reviewing related literature and analyzing studies then developing GHOSHEH ID Model by Ghosheh and reviewing it by the authors in addition to judging the model by ten experts in education and instructional design. After that, a training program was designed to train teachers to use the model synchronously with applying it with students online, so that teachers experienced the model and reflected their experiences. Data was collected by three instruments then it was analyzed, and results were discussed.

Mixed methods of qualitative and quantitative approaches were applied to integrate quantitative statistical results with qualitative findings. Data has been gathered since (March-June, 2020) and has been triangulated by using three instruments; The first was a descriptive case study for a sample of technology teachers, who were trained on GHOSHEH ID Model in Ramallah, Palestine.

The second was two recorded focus group interviews that were conducted through ZOOM. Permission was obtained to record the discussion with participants. Questions of the focus groups were developed previously by the researchers and were judged by three educational experts.

The third was a questionnaire designed to evaluate the developed model, consisting of three parts: The first section included personal questions related to gender, educational qualification, specialization, experience, and training on the model. The second part included 34 items that evaluated the role of the model in developing teachers' e-learning competencies. Likert's five-point scale was used, so that (5) indicated strong agreement, whereas (1) indicated strong disagreement.

9.2.2.3   Validity

Content validity of the questionnaire was examined, by three educational experts (two of them have a Ph.D. degree in education, whereas, one has a master's degree. Experts had 8–10 years' experience in professional education training programs). The questionnaire was developed according to their recommendations. The internal consistency of the questionnaire was examined by calculating the Pearson Correlation coefficient between the degrees of each domain. The results indicated a great degree of internal consistency within the domains and the overall score of the scale. Construct validity was examined by applying factorial analysis; three eigenvalues were more than 1. These factors explained %74.86 of the total variance. Accordingly, no item was deleted, so the number of items was 34 divided into 3 domains. Appendix 1 shows the expressions and loadings of the items of the questionnaire. Alpha-Cronbach scale was calculated and was 0.973 indicating very high reliability.
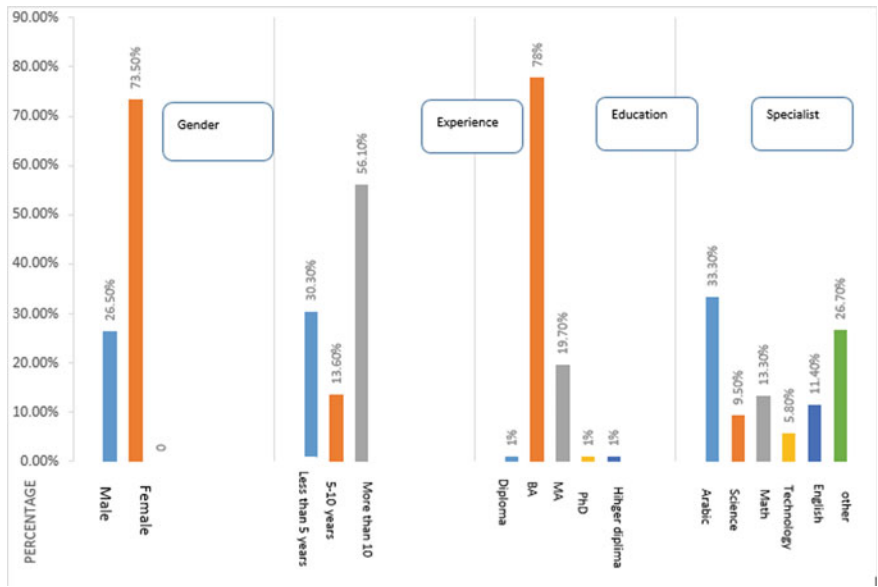
Fig. 9.4 Characteristics of the sample that responded to the questionnaire for evaluating GHOSHEH ID model

9.2.2.4　Sample

The study was implemented by an intentional and purposive sample of accessible teachers who enrolled in a training program implemented by the National Institute for Educational Training (NIET) in Palestine, and employed the model with students. The total number of the target teachers was 165; 20 of them are the members of case study, 22 teachers (20 females and 2 males) participated in the two focus groups (11 in each group). The first focus group consisted of 11 teachers (10 females and a male), the second consisted of 10 teachers (9 females and a male); the number of males was less because females welcomed joining groups than men. 123 teachers responded to the questionnaire as shown in Fig. 9.4.

9.2.2.5　Data Analysis and Findings

First Question

The first question was answered using a descriptive case study with a group of technology teachers (7 males, 13 females) who teach juniors and were enrolled in the training program implemented by NIET. These teachers from Ramallah public schools in Palestine, were trained to employ GHOSHEH ID Model in designing e-content and implementing it with students, their trainer was one of the researchers

(Sartawi), who holds a master's degree in curricula and teaching methods, with over than 23 years of experience in education and teachers' training. Training on GHOSHEH ID Model was online due to the spread of COVID 19 and schools' closure, then followed by consulting teachers during the process of application.

Thematic Analysis of the trainer's observation revealed these categories:

- Challenges caused by the sudden transformation from face to face to online teaching. The trainer noticed that teachers enrolled in the training program were not ready and even anxious to deal with the new approach that depended on e-learning. Therefore, there was a need to provide teachers with a model to guide and assist them in adopting e-learning.
- Application of GHOSHEH ID Model: Teachers applied the model steps with students during the training program. The trainer described one of the designed e-lessons aimed at conducting an awareness campaign by students to stop the spread of COVID 19 as follows:

  - Teachers presented selected OER's related to Coronavirus to students through many platforms and social media applications, which enabled teachers to communicate with students. Teachers asked each student to reflect on the OER and to write his reflection. This step was conducted asynchronous, and students were given enough time to express their experiences, knowledge, and skills, then sent their writing to their teacher.
  - Teachers applied the second step of the model by asking reflective questions to students about the OER. Later, their answers were recorded.
  - Through the third step, teachers discussed the objectives of the lesson and summarized it with students.
  - In the fourth step, teachers presented a problem to learners to encourage them to launch an online awareness campaign to limit the spread of Coronavirus.
  - Teachers implemented the fifth step by assisting students to join virtual groups in order to solve the problem; this was done by continuous communication between teachers and students, and students themselves who worked collaboratively in virtual groups.
  - In the sixth step, teachers gradually assigned students with basic tasks such as: Writing a story to narrate the history of Coronavirus in different countries, creating short sensitization videos, gathering information about it in different countries around the world, writing phrases explaining dangers of the spreading virus, suggesting ways to limit the spread of it, selecting a name for each campaign, such as (Stop Corona) and finally, posting the students products worldwide. To achieve these steps, teachers cooperated with students to build specific rubrics that enable students evaluate their works and their colleagues. Two weeks were enough for students to do these assignments and solve the problem. During this period the teachers were following the students up as they carried out the tasks one by one and provided them with feedback using some open educational resources such as: Zoom, Kahoot Site, Google Forms, Quizizz and Nearpod.

Table 9.1 Means and standard deviations (SD) of teachers' responses to the domains of the model evaluation questionnaire

No.	Domain	Mean	Standard deviation	Degree of agreement
1	Developing teachers' professional competencies required to enhance learners' skills online	3.61	0.085	High
2	Developing teachers' competencies related to e-learning design	3.59	0.081	High
3	Developing teachers' competencies required to evaluate and follow students up	3.49	0.088	High

Students were accordingly learning technology, languages in integration with other disciplines such as science, art, and mathematics, in parallel with serving their community by trying to minimize the spread of COVID 19. Teachers evaluated students' work using rubrics and provided them with constructive feedback.

Finally, teachers encouraged students to share their products including new educational resources such as stories, videos, students' voices, computer programs, and reports of Coronavirus worldwide.

Second Question

To answer the second question, data was retrieved from the questionnaire, and analyzed using SPSS to calculate means and standard deviations within and between the questionnaire domains. Data showed that the total mean of the questionnaire items was (M = 3.56) and the standard deviation was (SD = 0.080) which indicates high degree of agreement with the role of the model in developing the professional teachers' competencies as shown in Table 9.1.

Table 9.1 reveals that teachers highly agreed on the role of GHOSHEH ID Model in developing their professional competencies related to designing e-learning, adopting, and assessing and following students up. Appendix 1 shows the means for each item, where the highest means were for the items (4, 2, 14, 34) which focused on the role of the model in helping teachers to employ technology in teaching, and to use OER's to achieve learning goals, employ e-learning in emergency contexts, and developing students' technological skills.

The questionnaire included a (yes, no) questions to explore teachers' opinions about the appropriateness of the model for e-learning. Analysis of teachers' responses on this question indicated that (79.6%) of teachers considered the model suitable for e-learning.

In order to answer the same question, a thematic analysis of the data was collected through the two focus groups, and the following themes were identified:

- GHOSHEH ID Model contributed in developing these e-learning competencies for teachers:

  – Planning: The model helped teachers to design and plan e-lessons. These lessons were student-centered and related to the context, teacher (N) described this by saying: "*I followed the model's steps to design educational lessons, students participated and enjoyed the lessons activities. We worked hand by hand with students, and the educational process didn't stop*".

  – Technological Competences: The model depended on producing new OER's and sharing them via online platforms and social networks. This required teachers to develop their digital literacies to be able to employ the model in teaching and maintaining continuous communication with students, Teacher (M) said: "*We searched applications, created a YouTube channel, employed technology in teaching effectively, began designing online lessons, and we contacted continuously our students online*".

  – Assessment and Evaluation: Teachers were trained to develop authentic assignments for evaluation that focused on solving life's problems, helped to highlight the students' talents as teacher (S) stated: "*Assignments encouraged students to design pictures of the Coronavirus, write stories, draw and color them, make videos with sounds and images, write articles about it and ways of spread… Which helped to provoke the power of students*".

  – Open Practices: The model focused on employing OER's to create others and share them. Teachers have trained to create the new OER's and then assisted students to create and post. This have developed teachers' open practices as described by teacher (R): "*I tried to get students to interact with Mother's Day, so I gave them a related open image selected from Internet that inspired them to produce new images or videos and present them. Students were happy and thoughtful. Moreover, I assisted students to create new realistic OER's that reflected the effect of learning on real life. These OER's were posted online through school websites, and internationally through YouTube channels by students and teachers*".

  – Attitudes toward e-learning and GHOSHEH ID Model: The optimistic outputs observed by teachers who applied the model promoted their positive attitudes toward e-learning through the model; some preferred to continue teaching according to this model online more than face to face such as teacher (B), who stated: "*My students excelled and won awards, because of this model, which was more interesting than face-to-face meetings, this is a shift in learning, and the model was distinguished because it includes appropriate sequence. Moreover, it attracted the students' attention*".

- Continuity of Educational Process: The model enabled teachers to continue teaching despite all the barriers imposed by the Corona Pandemic. Teacher (O) said "*During the Corona period, I was able to contact my students, I did not lose touch with them…The continuation of the learning process enhanced everyone's motivation*".

- Challenges of Implementing GHOSHEH ID Model:

– Poor technological environment, including: lack of computers, low infrastructure of Internet, especially if a family has several members online at the same time.
– Applying this model depends on different abilities of teachers to communicate with learners and parents.
– The model needs extra time and efforts by teachers to achieve continuous communication with students.

9.3   Discussion and Conclusion

The current chapter aimed at exploring the role of a developed ID model integrated with OER's called (GHOSHEH ID Model) in developing Palestinian teachers' professional competencies to adopt e-learning. Results showed that GHOSHEH ID Model has developed teachers' content, technological and pedagogical competencies related to planning, designing, implementation of e-content that integrates OER's with ID to engage students in learning, assessment, and authentic evaluation. These competencies were developed when teachers applied the model's steps that assisted learners to develop their knowledge, life skills, leadership skills related to decision-making, communication, and teamwork in addition to develop learners' talents such as drawing, photography, acting, programming, writing stories…. etc., that were discovered through working with authentic assignments.

Results of the questionnaire highlighted a high agreement of teachers on the role of the model in developing competencies necessary for designing and implementing e-learning. The highest responses were to the items that emphasized the model ability to help teachers for employing technology and OER's in education to achieve learning objectives, employ e-learning in emergencies, and developing students' technological skills, matching with studies that found positive role of trainings based on instructional design models in developing technological, cognitive, and pedagogical competencies of teachers. This was confirmed by the focus groups that expressed the role of both using OER's with appropriate strategies in developing teachers professional competences in consistency with the results of (Kim, 2018; Kopish, 2017; Panda & Santosh, 2017; Stracke, 2019), which enabled them to reuse OER's and create in cooperation with learners new OER's then share them all over the world, as an evidence of the development of digital literacy and open educational practices as stated by Paskevicius and Irvine (2019) and Van and Katz (2019).

Despite of challenges that teachers and learners faced due to emergencies and sudden shift of education; the results of the study revealed the positive contribution of GHOSHEH ID Model that provided opportunities for applying several constructive strategies in educational social context. Thus, the strengths of these different strategies were integrated, while the weakness were improved. Moreover, aligning the developed model with Gagne's ID Model increased its efficiency along with integrating sociocultural theory with cognitive constructivist Piaget's theory, supported

GHOSHEH ID Model effectively, and explained its contribution to the development of teachers' e-learning competencies related to engaging students in learning, and developing higher thinking skills through reflective questions reinforced by problem-based strategy and cooperative learning with integration of authentic assignments that promote learners to create OER's and share them.

Moreover, applying GHOSHEH ID Model allowed teachers to facilitate what is called micro-learning; OER's allowed teachers to use several short contents, followed by reflective questions and discussion that enabled learners to absorb and retain information then apply the gained knowledge in solving a real problem that was divided into small chunks to enable personalization of learning. In addition to that, teachers supported micro-learning by facilitating social interaction between learners through virtual teams, which encouraged collaborated learning. Teachers assisted learners to participate in a process of co-creation of new OER's and share their products. The promising products enhanced teachers' attitudes to adopt e-learning in addition to enhancement of their skills and knowledge and thus teachers' competencies to adopt e-learning. Considering these findings, the study recommended to:

- Conduct more research on GHOSHEH ID Model in order to explore the effect of the model on students' performance and skills in various disciplines.
- Design e-contents according to the model and share them with teachers.
- Reduce challenges related to infrastructure, overloaded teachers, and crowded curricula.

Appendix 1

Analysis of the questionnaire assessing GHSHEH ID Model and examining the factors with loadings.

No.	Item	Loadings	Mean	Standard deviation	Agreement degree
The role of the model in developing teachers' competencies related to e-learning design					
1	Plan for student-cantered lessons	0.585	3.50	1.15	High
2	Utilize open learning resources (such as pictures and videos available on the Internet for free) to achieve learning objectives	0.779	3.85	1.09	High
3	Design electronic learning resources (such as videos) to achieve learning objectives	0.747	3.59	1.16	High

(continued)

(continued)

No.	Item	Loadings	Mean	Standard deviation	Agreement degree
4	Activate technology in education	0.727	3.86	1.03	High
5	Continuous online communication with students	0.659	3.44	1.14	High
6	Communicate with parents to support student learning	0.527	3.36	1.09	High
11	Post the students production on internet	0.529	3.49	1.18	High
18	Present attractive learning resources (pictures and movies) to students at the beginning of each lesson	0.618	3.69	1.14	High
Total mean and standard deviation of the second domain			3.59	0.081	High
The role of the model in developing teachers competencies required to evaluate and follow up students					
7	Take into account the differences between students	0.772	3.54	1.19	High
3	Design lessons that take into account different learning styles	0.599	3.48	1.18	High
9	Design real evaluation tasks	0.671	3.31	1.17	High
10	Online monitoring of students work	0.673	3.50	1.11	High
13	Communicate online with fellow teachers to solve professional problems	0.563	3.64	1.16	High
Total mean and the standard deviation of the third domain			3.49	0.088	High

No.	Item	Loadings	mean	Standard deviation	Agreement degree
The role of the model in developing teachers professional competencies required to enhance learners' skills					
12	Emphasize the students' role in the educational process	0.513	3.59	1.14	High

(continued)

No.	Item	Loadings	mean	Standard deviation	Agreement degree
14	Utilize e-learning in emergency contexts	0.610	3.82	1.15	High
15	Utilize learning to serve society	0.693	3.67	1.17	High
16	Learn the technological skills necessary for the educational process	0.617	3.77	1.18	High
17	Continuous reflection on educational practices	0.633	3.58	1.12	High
19	Asking questions that stimulate students higher-order thinking skills	0.690	3.63	1.21	High
20	Provide opportunities for students to reflect on knowledge	0.772	3.52	1.15	High
21	Provide opportunities for students to apply their knowledge	0.730	3.63	1.13	High
22	Develop students teamwork skills	0.707	3.56	1.15	High
23	Ask the students' to have responsibility* of their work	0.331	3.52	1.14	High
24	Facilitate employing of what students learnt in serving their community	0.674	3.46	1.13	High
25	Support students to become knowledge producers	0.763	3.58	1.11	High
26	Enhance students' self-assessment skills	0.761	3.55	1.12	High
27	Enhance peer assessment skills within the students	0.717	3.42	1.06	High
2S	Show the students' different talents	0.746	3.53	1.15	High
29	Enhance the students' communication skills	0.740	3.69	1.12	High
30	Take into account the differences between students (their tendencies, learning styles, intelligences)	0.743	3.59	1.13	High

(continued)

(continued)

No.	Item	Loadings	mean	Standard deviation	Agreement degree
31	Enhance students' self-confidence	0.699	3.67	1.16	High
32	Enhance students' scientific research skills	0.666	3.66	1.19	High
33	Develop students' problem-solving skills	0.701	3.67	1.07	High
34	Develop students' technological skills	0.698	3.82	1.15	High
Total mean and standard deviation of the first domain			3.61	0.035	High

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Chapter 10
Challenges Facing Online Learning During COVID-19

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Abstract Technology became the main pillar of our life. This importance has increased during the spread of COVID-19. This study came to reveal the challenges that face online learning during COVID-19 period. To achieve the study aims, the researchers used a qualitative approach to explore the factors and the teaching strategies that influence students, engagement in the online learning from the perspective of teachers and students. They were selected from different schools and background were selected to participate in this study survey. SPSS was used to analyze the data. The results showed that there is no difference between male and female in using online learning. There are challenges such as the negative attitudes toward online learning. They don't have enough competences to use it. The result showed that students, teachers, parents didn't prepare well to the closure. The study recommended that

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the Ministry of education should enforce the schools' infrastructure on the other. Besides, students have to employ their smart and digital tools in benefit way. They also have to recognize the importance of online learning during crises as a suitable solution to many challenges by enhancing their ICT skills.

Keywords COVID-19 · Challenges of learning · Online learning · Emergency remote learning

10.1   Introduction

No one can refute the importance of technology in our life (Soro et al., 2019). This importance has increased during the spread of covid-19 pandemic, which causes clause down to all sectors of our life. The shift to online lessons and adopting the remote learning was the solution. COVID-19 pandemic grew quickly to become a global phenomenon. Moreover, it became as a shock infecting and killing thousands of people around the world. As a matter of fact, educational sector is the most sectors affected by the spread of COVID-19. Of course, countries around the world closed schools, universities, and institutions. This has led to alternative modes of learning in many universities and institutions around the world (Mulenga & Marbin, 2020).

E-learning is the solution. In general, the development of technology and assessment system have taken headway solutions for education to continue the learning process and to reduce the gap which will arise during the lockdown (Vitoria et al., 2018). This sudden shift causes some challenges at all the stages of education in particular learning process and learners (Ali, 2020). To mention, more than 1.7 billion students were out of their schools and universities in more than 190 countries (Abbasi et al., 2020) with the rapidly spread of Corona virus in many countries. These challenges were different from one place to another referring to culture, readiness and content. Despite the adoption of e-learning all over the world, it wasn't considered as a formal education in Palestine because both students and teacher are still in the process of getting acquainted with e-learning.

The Palestinian educational system which adopted remote learning faced various challenges and difficulties, too. As a result of these crisis, researchers in this study shed light on the most important challenges which faced the learning process in Palestine during COVID-19 pandemic. They included teachers, learners and some suggested solutions to overcome these obstacles.

Questions of the study

– What are the challenges that face online learning?
– Are the challenges that face online learning differ according to the gender, place of residence, college, year of study and the level of the study?

Purpose of the study

This study came to investigate challenges facing online learning during COVID-19. This study may introduce suggestions to the most of the challenges which appeared during the crisis.

The importance of the study

This is a qualitative study came to shed light on the challenges that faced students and structures during the spread of COVID-19 pandemic. During the closures, the whole world shifted from face to face to online learning. During this shift, many challenges have appeared need to study and conduct them. This study will be very benefit to reveal the challenges that faced students and instructor during the spread of COVID-19.

10.2   Literature Review

10.2.1   Challenges Facing E-learning

10.2.1.1   Schools and Teachers

The spread of Covid-19 has changed the world suddenly. In this case, barriers were appeared in education sector.

Actually, School closure in COVID-19 have left 45.5 million school students and about 3.1 million teachers change to online learning and teaching (Mailizar, 2018). It is clear this pandemic has had a very big effect on schools, students and teachers. Therefore, schools have limited experience with e-learning; they didn't prepare e-learning resources. In addition, teachers don't understand how to use online application (Zaharah et al., 2020). Moreover, many teachers suffered from many challenges: First, hardware access and technical support while the second relates to pedagogy, belief of personal performance. Mailizar (2018) proposed two classifications of barriers: Material and non-material barriers; material barriers refer to lack of ICT resources while non-material barriers relate to teachers' knowledge and skills, this will be discussed later.

Firstly, teachers' e-learning barriers consist of various aspects such as knowledge limitations and assessment challenge. In addition to the lack of their confidence, teacher's unwillingness to change their practice, teachers lack of understanding of e-learning advantages, teachers' attitudes and beliefs to ICT and teachers' knowledge and experience. Other important limitations were lack of adequate professional development concerning technology, limited physical resources, inadequacy of resources, lack of technical support competence and confidence lack of assessment tools teachers' attitudes to online instruction impact how and if learner will learn. Thus, they were unable to read the face to face and mood of students, besides the lack of immediate feedback, simulation techniques in laboratory practical, some

teachers were not sure if students switched on the computer at the moment of sitting (Lee, 2020).

Secondly, first thing to remember that students' engagement plays crucial role for students learning and satisfaction in distance education (Popovici, 2015). Above all, engagement defined as the "ability to hold the attention of an individual or to induce the individual to participate in some sort of activity" (Chen et al., 2020, p. 1). While student engagement has been defined as "the student's psychological investment in an effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote".

The findings of previous studies assert the importance of engagement to mitigate rate of dropout, student's isolation in online environment, and retention (Banna, et al., 2015; Khlaif et al., 2017). Khlaif et al. (2017) stated three types of engagement including learner-learner engagement, learner-content engagement, and learner-instructor engagement.

Besides, during the lockdown, the physical access to the classroom has been restricted by the closing of educational institutes affected children and young primarily. The successful implementation of e-learning system depends on how the program is performed by students and instructors (Thongsri et al., 2019). In the light of the above reasons, students showed a negative perceptions of online learning behavior. They are anxious because of lack of enjoyment at classroom.

Thirdly, a rising number of students are from lower-income families (Richard & Anthony, 2019). In other words, around 25% of students in this world don't have computers (Auxier & Anderson, 2020). Sintema (2020) reported that students suffered from multiple stressors. Meanwhile, Crooks et al. (2020) stated that some students suffer from the lack of IT knowledge.

Finally, ICT infrastructure, to start, some of students don't have laptops and the mobile phones were not enough to participate in online learning. Some students were suffering from financial problems and they didn't have conductive learning environment and students had to leave the school immediately without carrying their books and it was not possible for them to take part in e-learning (Huffman, 2018). At the same time, excessive internet cost is another obstacle (Adamet al., 2020). In other words, most of the challenges were related to the students and their responses to the needs of online teaching, which include uninterrupted electricity connection and intermittent signal issue (Khan & Yu, 2020).

10.3   Methodology

A quantitative approach was used to explore the factors and the teaching strategies used that influencing students' engagement in the online learning environment under COVID 19 crisis from instructors and students' perspectives, a questionnaire was used for data collection.

10.3.1   Context of the Study

The proposed conducted in Palestine which is a country that is still suffering from violence and unstable country (ANNU).

10.3.1.1   Participants and Data Collection

Students from different schools and from different background will be selected to participate in survey. The same students have been chosen to participate in a quantitative part: online survey through the student's university email. Using the university portal. Survey with open-ended questions (faculty members: 610 males and females): The open-ended questions were about student's readiness from faculty members' perspective based on their lived experience during the second part of the second semester at the university. The link of the online survey will be sent to the student in both universities by using the email system in the universities.

10.3.2   Ethical Issues

Before conduct data collection, the researchers will inform the participants about the purpose of the study and get their permission to record the interviews and the focus group sessions. Furthermore, the research will ask the instructors to observe some online courses and take notes about student's interaction.

10.3.3   Data Analysis

– SPSS was used for quantitative data analysis.

10.3.4   Sample of the Study

Table 10.1 represents the characteristics of study sample, shows the result of the first hypothesis and the first question.

10.3.5   Questions of the Study

– What are the challenges that face online learning?
– Are the challenges that face online learning differ according to the gender?

Table 10.1 Characteristics of study sample

Variable	Type	N	%
Gender	Male	1336	36.7
	Female	2206	63.3
Place of residence	Village	1938	54.7
	City	1495	42.2
	Camp	109	3.1
College	Economic and social sciences	516	14.6
	Graduate studies	125	3.5
	Agriculture and veterinary medicine	77	2.2
	Islamic law	52	1.5
	Medicine and health sciences	883	24.9
	Science	116	3.3
	Human sciences	182	5.1
	Educational Sciences	158	4.5
	Fine arts	99	2.8
	Law	113	3.2
	Engineering and IT	1090	30.8
	Hisham Hijawi	131	3.7
Year of study	First	1103	31.1
	Second	900	25.4
	Third	753	21.3
	Fourth	593	16.7
	Fifth	162	4.6
	Sixth	31	0.9
Level of study	Ph.D	31	0.9
	M.A	156	4.4
	B.A	3118	88.0
	Diploma	237	6.7
Total		3542	100

Table 10.2 shows about 95% of the students had smart phones, while 76% had internet access at home and half of them believes e-Learning is a partially good solution. It worth noting 70% of the students prefer to have future face to face lectures instead of eLearning.

The result of question two:

Questions of the study

– Are the challenges that face online learning differ according to the place of residence?

Table 10.2 Students' access to digital technologies

Item	Yes		No	
	N	%	N	%
I have a computer or laptop	2134	60.2	1408	39.8
I have a smart phone	3362	94.9	180	5.1
I have internet access at home	2703	76.3	839	23.7
I believe eLearning is a good solution	552	15.6	2990	84.4
I believe eLearning is a partially good solution	1808	51.0	1734	49.0
I studied courses thought Moodle	706	19.9	2836	80.1
I used social media in my courses	1247	35.2	2295	64.8
I have knowledge of Microsoft Word and PowerPoint	2179	61.5	1363	38.5
I prefer to substitute lectures in future	2495	70.4	1047	29.6
The existence of supportive technical center at the university will help me in overcoming technical challenges	1265	35.7	2277	64.3

Table 10.3 indicates the low level of technological competencies that students have as less than 15% of them use Moodle as learning management system. While about 20% use live steaming platforms. One third of the students uses YouTube in their learning in a good manner.

Table 10.3 Students' technology competencies

Competency	High		Moderate		Low	
	N	%	N	%	N	%
Using smart phone for distance learning purposes	764	21.6	1623	45.8	1155	32.6
Using Moodle as learning management system	500	14.1	1368	38.6	1674	47.3
Using synchronous live streaming platforms as Zoom, BigBlueButton (BBB) and Google Classroomto achieve group learning tasks	735	20.8	1313	37.1	1494	42.2
Using internet of things in learning as Cloud Computing, wearable technology	336	9.5	944	26.7	2262	63.9
Using YouTube in learning	1179	33.3	1271	35.9	1092	30.8
Using Google free tools for learning (forms, shared documents, drive)	767	21.7	1242	35.1	1533	43.2

Result of question three:

Questions of the study

– Are the challenges that face online learning differ according to the college?

Table 10.4 presents the negative students attitudes toward distance learning as almost 67% were not ready to online learning, their achievement was affected badly and didn't have the desire to participate in future online learning.

Institution facilitate transition to ERL.

Results of question four:

Questions of the study.

– Are the challenges that face online learning differ according to the year of the study?

Table 10.4 Students' attitudes toward distance learning

Attitude	Agree		Neutral		Disagree	
	N	%	N	%	N	%
I was ready to distance learning in emergency case	584	16.5	589	16.6	2369	66.9
I accepted the idea of distance learning because of the emergency case	1253	35.4	690	19.5	1599	45.1
I preferred synchronous learning more than asynchronous learning	1373	38.8	1217	34.4	952	26.9
I'll continue on distance learning even after emergency case is over	667	18.8	493	13.9	2382	67.3
Employing distance learning increased my interest in lectures	608	17.2	515	14.5	2419	68.3
Employing distance learning enhanced my participation in lectures	458	12.9	459	13.0	2625	74.1
Employing distance learning had a positive role in improving my achievements	522	14.7	534	15.1	2486	70.2
Employing distance learning change the learning to be learner centered	775	21.9	553	15.6	2214	62.5

Table 10.5 The availability of technical support to facilitate distance learning

Item	Agree		Neutral		Disagree	
	N	%	N	N	%	N
There are several guides available for student to use distance learning systems	773	21.8	863	24.4	1906	53.8
I easily got a technical support when I faced technical problem	441	12.5	1075	30.4	2026	57.2
Training on solving technical problems is sufficient	511	14.4	1054	29.8	1977	55.8
There are no updated software to facilitate distance learning	1679	47.4	728	20.6	1135	32.0
There were different ways of technical support before and within distance learning lectures	557	15.7	1042	29.4	1943	54.9

Table 10.5 clarifies the lack of technical support and training that students had. More than 50% were left alone when they faced problems, no guides or instructions were available.

Results of hypothesis five and question five

– Hypothesis of the study
– There is no statistically differences at ($\alpha \leq 0.05$) in the means of challenges facing online learning during COVID-19 due to the level of the study.

Questions of the study

– Are the challenges that face online learning differ according to the level of the study?

Table 10.6 shows the lack of infrastructure which supported distance learning. A high percentage of students haven't an access to the university learning management system. They can't determine the relevant online tools. Moreover, they believed the internet services were slow to upload assignments and homework.

10.4 Study Results' and Discussion

This study came to investigate challenges facing online learning during COVID-19.

Table 10.6 The availability of infrastructure at the university to facilitate distance learning

Item	Agree		Neutral		Disagree	
	N	%	N	N	%	N
The accessibility of LMS on university network	757	21.4	776	21.9	2009	56.7
There are several facilities to use technology in learning	872	24.6	771	21.8	1899	53.6
I have appropriate technology to use in distance learning	951	26.8	618	17.4	1973	55.7
The technical possibilities (infrastructure) decreased the opportunities of distance learning	1753	49.5	867	24.5	922	26.0
The slowness of uploading files and assignments on Moodle	1952	55.1	619	17.5	971	27.4

The first table shows the characteristics of study sample with these variables (Gender, place of residence, college, year of study and level of study). The sample amounted to about 3542, of whom 2206 are females and 1336 are males. This indicates that the number of females exceeds males in this study. As for the place of residence, the largest number of the sample lived in villages around 1938 and the least number of them lived in the camp 109. The third variable is the college, where the largest number of the sample in the college of Engineering and Information Technology was 1090 and it comes in the second place in the College of Medicine and Health Sciences. As for the fewest numbers taken from Islamic Sciences, and for years of study, the largest number of first-year students was 1103, and the lowest number was sixth-year students 31. The last in the sample was about the educational level, as the largest number of Bachelor's students was 3118 and the least number of PhD students were 31.

The results of the first table show that there is no difference between male and female in using online learning. The researchers due this results because all Palestinian people lived under the same conditions during the pandemic. Besides of the fear from trying anything new they feel isolated. This result agrees with previous studies such as Banna, et al. (2015) and Khlaif et al. (2017). The answers to the first sentence of this table showed that students who own computers account for 60% while those who do not have 40%, and that the number of students who own smart mobile devices is 95% while they do not have smart devices only 5%, and that the number of students who have home internet networks 76% of those without networks 24%,

and the fourth paragraph was about students' view of e-learning as a good solution. 84.5% did not see that e-learning solves the problem of education, and 16.5% saw it as a good solution to the education problem during this period. The table indicates that about 80% do not use Moodle in education, and their use of communication sites for education is 35.2%. The majority of students prefer face-to-face education (70.5%).

Although most of students have computers, smart phones and internet networks, few of them use the tools in studying via Model or social media sites, as it can be said that they use them in areas other than education, the results indicate that students prefer face education over distance learning. They have smart phones and other technological tools but they don't use them in learning. This may be because they turned their learning into distance learning suddenly. They prefer face to face learning instead of distance learning because they don't accustom of using distance learning tools in education, even they don't get enough training to use other apps in teaching and learning. Additionally, the financial and the educational situation of Palestine is fragile, and the infrastructure is weak. This result is confirmed with Tartir and Hawari (2020) and Johnson et al. (2018).

According to the result of the third table, students have low level of technological competencies; it seems that they use some platforms like model and YouTube in their learning and they lack of competences to use many other apps and platforms. This gives impression that students use special apps and platform for special purposes not in a permanent way. In the researchers' point of view this refers to school double burden; this didn't give them much time to use technology effectively. Then, the dangerous of Covid-19. They stayed at home thinking with it, this causes misuse of technology. This result agrees with Tartir and Hawari (2020) study which revealed that students, teachers, and parents didn't prepare very well to face the closure caused by the spread of Covid-19 suddenly. In addition, students don't have enough experience to deal with technological apps and tools. This result confirmed with Johnson et al. (2018) result; parents, and students lack of seriousness and of experience in dealing with these technological tools. In addition to the curriculum, there is no interactive or digital that suits the new situation as Lee (2020) study shows.

The result of Table 10.4 assured the result of the previous Table 10.3. It shows that students had negative attitudes toward distance learning. This means that the lack of ICT skills causes negative attitudes toward online learning, this was assured by Crooks et al. (2020). In fact, the sudden spread of Covid-19, unfamiliarity of this kind of learning, the lack of technological infrastructure and the boredom of using distance learning are the main reasons behind that negative trend toward distance learning. This result agreed with Zaharah et al. (2020) study which shows that both teachers and learners don't understand how to use online application. In addition, students feel isolated during distance learning this ensured by Khlaif et al. (2017) study. At the same time, teachers lack of suitable assessment tools, digital material and lack of synchronized engagement. This affect student's learning negatively. It showed clearly by Bergdal et al. (2018) and Khlaif et al. (2017) studies. Besides, Barriers related to the learners, the learners' motivation, this agreed with Leonardi,

et al. (2020) which confirmed that learners don't employ technological apps because of the lack of motivation toward them.

As for the availability of technical support to facilitate distance learning, it became clear according to Table 10.5 the lack of technical support and training for students where it appeared that more than 50% were left alone when they faced problems, and there were no available evidence or instructions. This is a result of the speed of schools and universities in implementing e-learning, at the beginning of the COVID-19 epidemic around the world due to the lack of other options. Therefore, universities have limited with e-learning; they didn't prepare e-learning resources and technical support to provide services and guidance to students (Zaharah et al., 2020). Thus some problems remain unresolved in times of crisis; in addition, there are no regulations, instructions for, and technical support in times of crisis. This agreement with the Zaharah et al. (2020) study in which the study showed that many teachers and student have experienced several challenges in e-learning in Covid 19: First, hardware access and technical support while the second relates to pedagogy, belief of personal performance. Mailizar (2018) proposed two classifications of barriers: Material and non-material barriers; material barriers refer to lack of ICT resources while non-material barriers relate to teachers' knowledge and skills.

With regard to the availability of infrastructure at the university to facilitate distance learning, the results, according to Table 10.6, showed the lack of infrastructure which supported distance learning. A high percentage of students haven't an access to the university learning management system. They can't determine the relevant online tools. Moreover, they believed the internet services were slow to upload assignments and homework, and this could be explained that around 25% of students in this world don't have computers (Auxier & Anderson, 2020). In other words, there are challenges related to the students and their responses to the needs of online teaching, which include electricity interruption and difficulties in access to the internet resources, this confirmed by Khan and Yu (2020).

10.5   Conclusion and Recommendations

Students feel afraid of using something new. Some students don't have smart phone which stay in their way of using online learning. They don't see online learning as a solution to the crises of education during COVID-19. Few of students use their smart phones to study. We can say that most of them prefer face to face education. They may do receive enough training to use e-learning. In addition to the lack of infrastructure and less competences in using online learning. This causes misuse of technology. It is clear that teachers, students, and parents left alone to face to face challenges of COVID-19 closure.

This study recommended that The Ministry of education should enforce the schools' infrastructure on the other. Stakeholders have to increase teachers and students' technological knowledge. They have to held new training sessions to train teachers how to employ technological apps, digital material and online assessment

to use it in their teaching. Students, also should trust their teachers and employ the technological apps in their learning. Besides, students have to employ their smart and digital tools in benefit way. They also have to recognize the importance of online learning during crises as a suitable solution to many challenges by enhancing their ICT skills.

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Chapter 11
Creative Drama in Language Education: A Systematic Literature Review

Laila K. A. Dawoud, Zuwati Hasim, and Mohd Rashid Mohd Saad

Abstract Recently, creative drama (CD) in education has become popular in different educational systems worldwide. Creative drama in the classroom is still new to students and teachers in Palestine. This chapter includes a systematic literature review that aims at extending the body of knowledge about creative drama by summarising its effect on students' linguistic and non-linguistic skills in EFL/ESL classrooms. After scanning the Web of Science, Science Direct, and EBSCO databases for publications published between 2009 and 2019, twenty-nine researches was found to be eligible for inclusion. The findings revealed the crucial role of creative drama in enhancing the four linguistic skills, listening, speaking, reading, and writing. The significant impact on supporting students' social, emotional, and critical thinking skills is also elaborated.

Keywords Creative drama · Drama in education · Educational drama · English teaching · English learning · Linguistic skills · Non-linguistic skills

Abbreviations

CDM	Creative drama method
CD	Creative drama
CDTs	Creative drama techniques
EFL	English as a foreign language
ESL	English as a second language
HOTs	Higher order thinking skills

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11.1 Introduction

Recently, English has become an international language spoken all over the world and facilitates people's lives. It is the language of technology, science, medicine, research, politics, trade and study (Wonglekha, 2010). Moreover, learning this language allows academic success and improves social dispositions. It also allows future professionals to communicate in a variety of social circumstances. The need for learning and teaching EFL is increasing, and this is not surprising. According to the British linguist, Graddol (2006), in his study "English Next", between 2015 and 2030, English learners will record two billion worldwide. And people know the importance of English in communication and data searching because of globalisation.

Furthermore, the success of English as a second or foreign language instruction is determined by the teacher's methodological approach in delivering his courses. Many institutions where English is taught as a second or foreign language still focus on the traditional teaching techniques, such as drilling and memorisation, have failed to improve students English skills, particularly their communication skills (Araki-Metcalfe, 2012; Gabitova et al., 2018; Greenfader & Brouillette, 2013). These techniques are problematic in many ways since learners are not permitted to study the language in real-life situations, restricting their engagement with native speakers of the target language (Athiemoolam, 2004). According to Fong et al. (2018), games and role-play are missing inside English classrooms. Therefore, a variety of methods are used to help students learn English. One of the most effective methods and powerful means of teaching and learning is the creative drama method CDM (Lei & Huang, 2012; Schneider & Jackson, 2000), which balances cognitive and emotional skills (Gabitova et al., 2018).

Throughout history, developmental drama, creative dramatics, educational drama, the mantle of the expert, informal drama, and process drama are all nomenclatures used to describe drama in education (Dawoud et al., 2020). However, the drama was first set as a pedagogy in language classrooms by Dorothy Heathcote during the 1950s (Uzuner, n.d). Creative drama is a set of classroom activities that put learners in imaginary situations where they play others' roles apart from classroom walls. Learners do this individually or in groups responding to others' actions or speech using their language in their communication (Holden, 2012). According to Shraiber and Yaroslavova (2016), CD in foreign language teaching is a mixture of procedures coordinating learners' role-related actions in specifically designed situations. Because these exercises provide language in a meaningful context and include vocal, physical, cultural, and intellectual components of communicative competence, drama oriented verbal and nonverbal activities encourage learners to speak spontaneously, think more deeply, and use body language (Uysal & Yavuz, 2018). In Palestine, Arabic is the people's mother tongue, and it is the official language in governmental institutions. It is also the medium of instruction in schools and universities. English language in Palestine is taught as a foreign language (EFL). It is introduced as a separate compulsory subject from the first grade until twelfth in schools. Likewise, in university, first-year students are supposed to pass two compulsory courses. Students

do not communicate in English outside their classrooms. Thus, their English language background is poor. According to Yasin (2019), students' general English language level in public and private schools that follow the Ministry's system is awful. He also added that the Educational Ministry itself is primarily responsible for this weakness, followed by those responsible for the curriculum, the English language supervisors, the school principals, the English language teachers, the end of the parents, and the negligence of many students. He said, "Our teachers teach things about the English Language; they do not teach the language itself".

The overall objective of this study is to push the Palestinian educational system and teachers to use CDTs by introducing them to the effects of creative drama techniques on linguistic and non-linguistic skills in EFL/ESL classrooms. Thus, a systematic literature review is done to accomplish the goal. This study is organised around two questions:

(a) What is the effect of creative drama techniques on EFL/ESL linguistic skills?
(b) What is the effect of creative drama techniques on non-linguistic skills in EFL/ESL classrooms?

The answers to these research questions are essential toward understanding the role of creative drama techniques on the students' linguistic and non-linguistic skills inside EFL/ESL classrooms to update the learning and teaching community.

11.2 Method

11.2.1 Data Collection

The authors conducted a systematic review of the following databases to use creative drama to teach English in classrooms: Web of Science, Science Direct, and EBSCO. The appropriate literature search was performed on November 8 and 9, 2019. English language, education, teaching, drama, educational drama, imagination, role play, and storytelling were utilised as search queries. The protocols specified in the Preferred Reporting Items for Systematic Reviews (PRISMA) statement were followed to ensure study quality (Moher et al., 2009). The PRISMA diagram of the selection approach is shown in Fig. 11.1.

The following criteria were used to obtain articles: produced in EFL/ESL education between 2009 and 2019 (10-year period), studied linguistic or non-linguistic skills, written in the English language, and classed as an article.
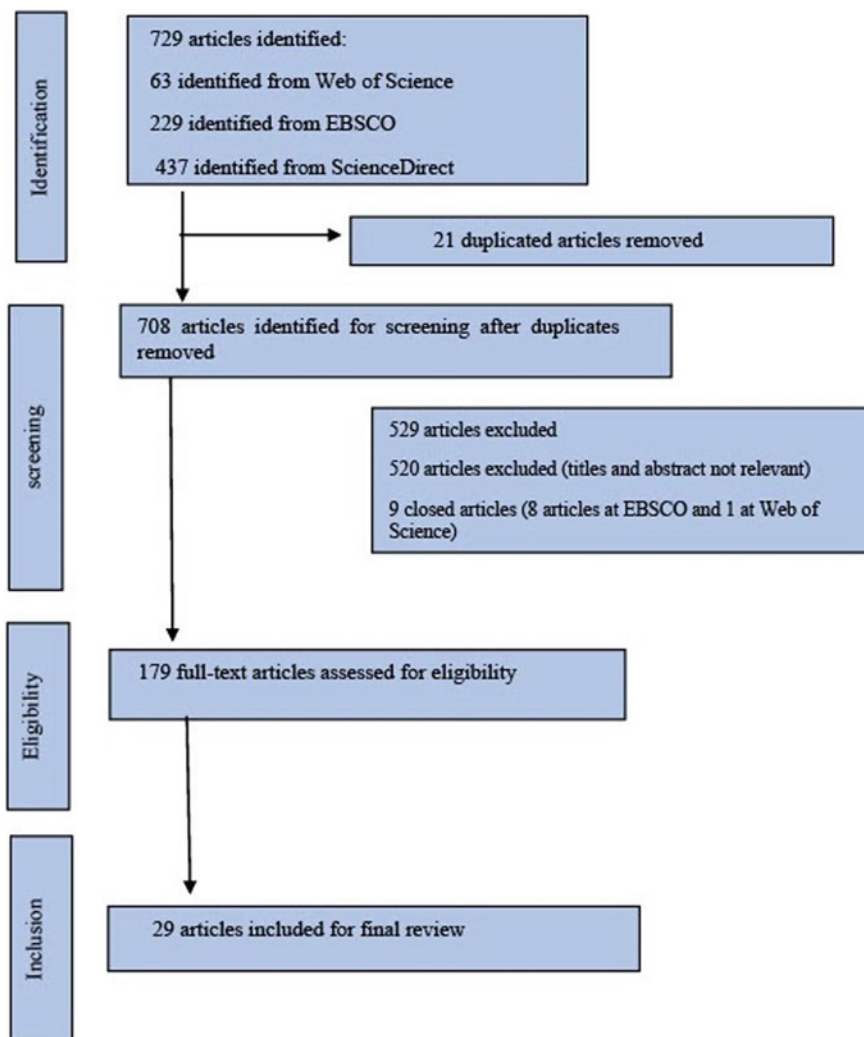
Fig. 11.1 Flow diagram of the search process and selection

11.2.2   Data Analysis and Category Identification

All publications' titles and abstracts were analysed to remove those that did not match the search criteria. When an analysis of the abstract was insufficient for selecting an article, the entire text was read. Following that, the examination and selection of articles took place. The papers were catalogued by journal name, year, author, title, objective, English skills (area), motives and findings in a database. In this study, data are extracted according to two types of criteria, linguistic and non-linguistic skills**.**

The researchers individually conducted a qualitative analysis using a category system construction to determine each article's study line. The categories were set by an inductive approach using abstract analysis, if doubt, a thorough reading of the text. The researchers' separate techniques were combined to validate the category categorisation, and the findings were argued until a consensus-oriented on the criteria for establishing each category. Later on, it was decided that some items may be categorised into multiple categories.

The first category is linguistic skills, which includes articles related to learning vocabulary, oral communication skills and literacy skills (reading and writing). The second is the non-linguistic skills, which investigated social skills, emotional skills, critical thinking, engagement and learner autonomy. They are shown in Table 11.2.

11.3   Results

Following the application of the analytic criteria, a total of 29 articles were selected as a final sample. Twenty-five articles have investigated linguistic skills, as shown in Table 11.1. Moreover, fourteen studies talked about non-linguistic skills; and nine of them are included in both categories. They are shown in Table 11.2.

11.3.1   Linguistic Skills Development Through CDTs

Classroom drama participation is linked to numerous literacy outcomes, including oral language use, reading comprehension, and writing, in a significant, reliable, and meaningful manner. Dramatic activities in class encourage learner's creative and

Table 11.1 Linguistic skills analysis (2009–2019)

Linguistic skills	Author
Vocabulary and idiomatic competence	(Abolfazli Khonbi & Sadeghi, 2017; Demircioğlu, 2010; Kalogirou et al., 2019; Uchiyama, 2011)
Communication skills (intercultural communication, speaking and listening)	(Anderson & Loughlin, 2014; Al-Gahtani & Roever, 2013; Atas, 2015; Haag, 2018; Fong et al., 2018; Gabitova et al., 2018; Galante & Thomson, 2016; Greenfader & Brouillette, 2013; Greenfader & Brouillette, 2017; Greenfader et al., 2015; Leon-Henri & Jain, 2017; Lei & Huang, 2012; Nordin et al., 2012; Mokhtar et al., 2011; Stinson, 2015; Sağlamel & Kayaoğlu, 2013)
Language literacy (reading and writing)	(Anderson & Loughlin, 2014; Nordin et al., 2012; O'Neill et al., 2016; Sanacore & Palumbo, 2010)
Learning english as a foreign language	(Araki-Metcalfe, 2012; Dundar, 2013)

Table 11.2 Non-linguistic skills analysis (2009–2019)

Non-linguistic skills	Authors
Critical thinking/negotiation	(Fong et al., 2018; Haag, 2018; Talhelm, 2015)
Engagement	(DeCoursey & Trent, 2016; Gonen & Veziroglu, 2010; Haag, 2018; Greenfader & Brouillette, 2017; Kalogirou et al. 2019; Stinson, 2015)
Learner autonomy	(Baranovskaya & Shaforostova, 2018)
Motivation/interest to drama	(Gabitova et al., 2018)
Social skills	(Baranovskaya & Shaforostova, 2018; Gonen & Veziroglu, 2010; Léon-Henri & Jain, 2017; Li et al., 2015; Mokhtar et al., 2011; Stinson, 2015)
Emotional skills	(Atas, 2015; Fong et al., 2018; Gonen & Veziroglu, 2010)

linguistic improvement (Anderson & Loughlin, 2014). The research lines generated during the period under review can be divided into four categories based on the content analysis. Notably, speaking skills constitute the lion's share of investigation with sixteen studies. Literacy and vocabulary skills form four studies each. In comparison, another two studies' aims were general to learn EFL.

The following sub-sections answer the first question, what is the effect of creative drama techniques on EFL/ESL linguistic skills?

11.3.1.1　Vocabulary Acquisition

Learning vocabulary is a vital skill. Nation (2011) stated that language use and vocabulary knowledge are mutually beneficial: language use enhances vocabulary knowledge, and vocabulary knowledge facilitates language usage. Moreover, some research in the vocabulary acquisition field suggests that various exposure to the target language and practice opportunities should be used, including receptive and productive forms (Nation & Chung, 2009). According to Kalogirou et al. (2019), drama assists learners in acquiring new vocabulary in a non-structured learning setting and promotes vocabulary acquisition effectively and accurately in various situations. According to Greenfader and Brouillette (2013), gestures and movements offered by drama techniques help students comprehend and remember the vocabulary presented in the lesson.

11.3.1.2　Communication Skills

Because language is one of the most evident parts of the drama, it is not sudden that drama research has a place in improving oracy. Greenfader and Brouillette (2017) reported that drama activities improve verbal engagement opportunities by encouraging collaborative and threat-free environments that allow learners to feel comfy

in oral practice. They went on to say that their CD program was most beneficial to English language learners who had the most limited English-speaking skill at the start.

It provides learners with situations to use different communication skills, e.g., delivering views, discussing and persuading, solving problems, etc. (Dundar, 2013). In these situations, learners take turns of speakers and listeners simultaneously. According to Lei and Huang (2012), drama activities encourage learners to participate rather than learn passively. So, automatic speaking and listening were observed among student–student interactions and teacher-students interactions while playing the given role (Araki-Metcalfe, 2012). Throughout speaking activities in a non-threatening atmosphere, fluency and pronunciation are improved (Al-Gahtani & Roever, 2013; Gabitova et al., 2018; Greenfader et al., 2015; Greenfader & Brouillette, 2017; KaÇMaz & Aksu AtaÇ, 2017).

11.3.1.3 Reading and Writing

In creative drama activities, learners' exposure to new texts with frequent words builds their reading skills (O'Neill et al., 2016). They also elevate independent reading ability across the syllabus (Sanacore & Palumbo, 2010; Talhelm, 2015). All in all, learners' reading comprehension skills and life interests are improved (Demircioğlu, 2010; Dundar, 2013; Li et al., 2015; Nordin et al., 2012).

In general, CDTs enhance writing skills' outcomes (Nordin et al., 2012) since they provide opportunities for learners to improve their writing skills (Demircioğlu, 2010). Dramatic script handwriting is the most used technique linked to writing skills' improvement among learners (Dundar, 2013).

11.3.2 Non-Linguistic Skills Through CDTs

Since one of the main criteria for data collection was English language subject, most of the included studies connected CDTs with linguistic skills. On the other hand, some studies investigated other non-linguistic skills. These skills were analysed to answer the second question, what is the effect of creative drama techniques on non-linguistic skills? Table 11.2 summarises them.

11.3.2.1 Social Skills

Creative drama attracts learners' attention (Mokhtar et al., 2011), put them at the centre of the learning process (Baranovskaya & Shaforostova, 2018) and transfer authority between student–student, student–teacher, and role-role (Stinson, 2015). Drama techniques often improve social skills and interaction since students are put

in situations that need them to communicate or work in groups. Thus, communication, social and linguistic obstacles are gotten through.

Through engagement in real-life situations, learners' positive social skills are improved versus passive ones (Gonen & Veziroglu, 2010; Li et al., 2015). Moreover, CDM put learners in others' shoes to improve their attitudes toward others and reduce racial discrimination based on colour, religion, race, gender (Gonen & Veziroglu, 2010; Leon-Henri & Jain, 2017). Accordingly, negative feelings of isolation and fear of refusal are lowered to the maximum (Demircioğlu, 2010). CD inquiry-based learning also enables learners to apply their acquired knowledge and skills to social issues from their academic subjects (Araki-Metcalfe, 2012).

11.3.2.2 Emotional Skills

CDM creates a closer relationship between students. When learners are put in others' shoes, they experience how others feel. As a result, their sense of empathy for others and depicts their reactions and feelings are improved. Notably, CDM expands learner's acceptance of others' problems and differences (Gonen & Veziroglu, 2010). Here, students face the confusion of decision making without stress and fear of being\doing wrong (Araki-Metcalfe, 2012; Fong et al., 2018). In other words, feelings of anxiety, tension, and stress decrease to the minimum (Atas, 2015).

11.3.2.3 Critical Thinking Skills

Teachers like to impart facts in the classroom and ask pupils to listen to their explanations. Making analogies to similar issues is the sole problem-solving approach utilised by teachers. This is demonstrated when pupils in the Palestinian classrooms struggle to answer higher-order thinking skills (HOTs) questions and are not exposed to thinking-based activities (Qablan et al., 2019). Critical thinking is a type of HOTs that involves analysing arguments and self-organising to investigate, research, and connect all aspects of a situation or problem. Data collection, organisation, memory, analysis, and the ability to develop insight through data are all aspects of thinking.

Critical thinking is not deep-rooted in human beings since birth. It is a skill that is learned, developed, and trained, and everyone can do so depending on mental, sensory, and abstract capacities. Many researchers like Fong et al. (2018), Haag (2018) and Talhelm (2015) reported the positive influence of CDTs on training and enhancing learners to think critically and solve problems.

11.3.2.4 Learner's Autonomy

In traditional classrooms, a teacher is a dominant power who symbolises the source of data and authority. Herein, teachers have complete control over the materials, learning environment, and the learners' right to speak. Nothing is allowed to go

beyond his control. Moreover, teachers prepare students for examinations by studying from textbooks and grasping the teachers' explanations (Wang, 2019). Students are dependent on their teachers.

Learner autonomy is defined as a learner's inherent abilities. It is accomplished by providing conditions and settings for language learners that encourage them to control all or part of their language learning programme (Esch, 1996).

Through CDTs, innovations in teacher and student roles are among the most significant changes that drama brought to FL instruction. Thanks to drama, these two characters are no longer bound by their traditional roles and can engage in a considerably more open and comfortable connection in the classroom. Herein, learners' role is not limited to be receivers and providers but expanded to be creators (Araki-Metcalfe, 2012). In other words, they become dependent and responsible for their own learning since drama-based teaching encourages learners' personal identity. (Baranovskaya & Shaforostova, 2018; Léon-Henri & Jain, 2017). Thus, the learner will use the foreign language without fear of being judged or making mistakes.

11.3.2.5 Motivation and Engagement

Motivation is classified into two types, intrinsic and extrinsic. CDTs attract students' attention, especially poor language learners, and motivate them to explore new data with others and learn English (Gabitova et al., 2018).

On the other hand, drama-based teaching creates a collaborative environment where students are trained and motivated to engage with others and be a part of all (Gonen & Veziroglu, 2010; Kalogirou et al., 2019;Stinson, 2015).

11.4 Summary

Notably, CDM is a promising tool in education. It includes several techniques to help students grasp data by putting them in an imaginary world where they practise authentic situations in different characters away from their real ones in a peaceful atmosphere. These activities are student-centred, where teachers become facilitators, sometimes participants, guides, and motivators. This shift in authority in classrooms allows students to feel free to verbally express their ideas, thoughts, opinions, and feelings in the target language without being afraid of making mistakes or laughing at them by others. All these characteristics make it a popular tool for teaching, and it is noticeable in the literature review that its influence is investigated on teaching ESL. Still, it is relatively slim on EFL teaching.

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Chapter 12
Effect of Implementing Technology-Enhanced Learning (TEL) on Students' Motivation—A Literature Review

Razan Mukhemar, Maysa Bsharat, Reema Jaber, and Suhair Shawar

Abstract This study investigates the effect of implementing technology-enhanced learning on students' motivation. It is an overview revision of educational literature related to the research topic. After the revision of educational literature, it can be said that technology-enhanced learning has an intrinsic educational value as a good way to motivate students and stimulate their motivation to learn. In addition to the need to integrate the education system with the new digital media in order to create a creative, innovative, and interactive generation. The study deals with some exciting topics related to technology-enhanced learning and its effect on students' motivation and the ways this effect is transferred through applying technology in learning on both intrinsic and extrinsic motivation. The study provides some recommendations that could help to develop successful methods to ensure that technology is used in teaching which serves the educational process to achieve educational goals.

Keywords Technology-enhanced learning · E-learning · Intrinsic motivation · Extrinsic motivation

12.1 Introduction

12.1.1 Background and Introduction

Our world today experiences challenges and crises that are accompanied by continuous change and development in various directions. This makes it imperative for different educational institutions to use modern methods that keep pace with the progress in all fields, especially the field of Technology and the digital world. Reflective and intellectual schools came to challenge the traditional attitudes toward education that had always prevailed in educational processes (Harandi, 2015).

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In education, modern methods aim at a positive transformation of student learning away from passive sitting in the classroom, and for the teaching experience to be more active, interactive, and dynamic. The primary concern for the use of digital technologies lies in intellectual expression and creativity, not just the transfer of scientific knowledge. Therefore, it has become imperative for any educational system to incorporate new digital media as tools for intellectual expression and to link educational goals with innovation, practice, and use of technology-enhanced learning (Laurillard et al., 2009). However, how can the teacher increase students' interaction and motivation to learn using modern technological methods?

The advent of technology and internet augmented education made it possible to deliver lessons all over the world through a single internet connection. Hence, it became the solution to increasing students' digital literacy, which means that learning technologies are easily accessible and usable. Despite the disadvantages of technology-enhanced learning, many students and teachers take this path to obtain better learning and education for its advantages compared to traditional learning. The abundance of regular mobile devices now means that students are well-positioned to use these technologies to interact with teachers and contribute to educational sessions (Sen & Leong, 2020).

There is a difference in motivation between students who use technology and students who learn traditionally (Laurillard et al., 2009). Recent studies have indicated that students who are enroll in technology-enhanced learning and e- learning courses outperform their classmates who are traditionally taught. Therefore, the establishment of an educational system capable of quickly adapting to its technological environment has become very necessary (Johnson et al., 2016). The question now is what is required of teachers to motivate students in a technology-enhanced learning environment? Teachers' understanding of students' motivations is essential, as it determines the success or failure of teaching and technological interaction. Therefore, in this paper, we are trying to find out whether technology-enhanced learning affects students' motivation toward learning on Students' Motivation.

12.1.2 Problem Statement and Research Questions

Students grow today in a world where interest in applications, social media, and websites is growing. Electronic devices, whether portable or computers, and the electronic games they contain have become common in our society today. In this changing and technology-driven world, teachers are under tremendous pressure to provide students with a quality education. And the constant search for technological tools that will enhance their learning and increase their motivation (Carstens et al., 2021).

With the increasing importance and reliance on the use of technology, it is important to investigate the impact of modern technology-enhanced learning interventions on student motivation. This analysis paper aims to answer the following research question:

With the rising importance and heavy reliance on the use of technology, it is important to investigate the effect of modern interventions of technology- enhanced learning on students' motivation. This analytical paper aims at answering the following research question:

1. What is the effect of Technology-Enhanced Learning on students' motivation?
2. What is the impact of Technology-Enhanced Learning effect on students' learning?

12.1.3 Methodology of Work

To address the research questions, an analytical review of the literature was conducted. We investigated the three main pillars of the topic that are technology-enhanced learning, motivation (both intrinsic and extrinsic), and the effect of technology on students' motivation.

The paper presents different views of previous researches on the topic with an analysis of these reviews and concluding remarks.

12.1.3.1 Selection of Articles

Since this is a general overview of literature, it uses articles that are in published journal articles. The selected articles were the ones that combine key words of "technology" AND "Enhanced learning" or equivalent synonyms along with "Motivation".

12.2 Literature Review

12.2.1 Technology-Enhanced Learning (TEL)

The learning and teaching process is greatly affected by technological developments, as it is not isolated from technology and its capabilities. Technology can be used to serve the educational process in order to achieve the required goals and avoid the negative effects of employing technology in the educational process. Therefore, it is necessary to aim at reaching the largest expected benefit from the employment of technology in the educational process (Linda et al., 2018).

Technology-enhanced Learning (TEL) deals with how to integrate and exploit the enabling technologies in the educational process. Thus, it focuses on teaching and processes that we adopt and are based on the use of technology (Conole & Oliver., 2002).

Wild also emphasized that TEL seeks to find a learner who creates knowledge and human development for efficiency, and to record and document it in the media such as books, instant messages, and the Internet, thus supporting learners' activity and their achievements in creating, developing, and disseminating knowledge, as well as developing the necessary capabilities using appropriate tools (Wild, 2016).

It is evident from many studies that there is a common characteristic in education, especially higher education, which is the use of technology- enhanced education. In higher education, there is an intensive focus on the use of various technologies and the time required to use many technologies, determining the ease of students' access to the required materials and the number of times they access them, as well as activating the hyperlink feature (Fikes et al, 2018).

Opinions differed about technology and its capabilities and effect on the educational process. Technology is a broad extensive field and can be developed to increase its ability to transform various educational practices. In spite of that, other researches took a different position represented by less certainty. They believed in the ability of technology-enhanced education to make education more flexible and accessible than traditional education. Also, they argued on the existence of a relationship between technology and different educational processes. Consequently, it becomes evident that there are multiple and different opinions about the link between technology and different educational practices (Sara et al. 2014).

Due to the many challenges facing education, especially in our present time and its developments, technology has played an important role in the educational process. However, to achieve the required goals, it was necessary to provide tools that help and support the technology process in promoting education, and among those proposed tools may be computers, tablets, and various Internet sites and applications. Moreover, the process of activating technology in education represented an additional challenge for both teachers and students as well (Johnson et al., 2016).

In their study, Li et al. (2010) explained that in order to achieve a successful integration of technology in the learning process, heavy efforts need to be made. He illustrates that the reliance of education on technology in order to accomplish an effective context that achieves the required learning goals demands intensive studies and Preperations.

While the results of Dunna and Kennedy (2019) study clarified that, based on previous studies, the behavioral participation with TEL should be taken into account. They highlighted the role and effect in the frequency of technology use, the duration of use and the ability to access. Moreover, they illustrated that the existence and correct use of IT resources, are vital pre- requisites to assure the behavioral participation effect and achieve the planned goals.

12.2.2   Motivation: Intrinsic and Extrinsic

Before investigating the effects of using technology on students' motivation.

A brief analysis of the term has been provided.

Student motivation has two types: Intrinsic motivation and extrinsic motivation. Intrinsic motivation arises from within an individual and results in learning for the sake of internal satisfaction; it is related with cognitive engagement. Students are intrinsically motivated when they are involved in learning, interested, or when they achieve their own personal objectives. They usually use strategies that need more struggle and that make them process more information. Extrinsically motivated students are tending to have the least amount of struggle necessary to get the most reward (Ozdemiri, 2020).

Kaya and Çenesiz (2020) explained some examples on intrinsic motivation so that responses developed within the individual toward inner needs such as curiosity, interest, knowing, understanding, sufficiency, and feeling of development. While intrinsic motivation is related to one's beliefs and values, extrinsic motivation is related to the existing conditions outside the person and is influenced by general judgments of the community about the profession. As for Kaya and Çenesiz, their study revealed that intrinsic motivation and life satisfaction were found to have a predictive effect on the psychological well- being of the pre-service teachers, but extrinsic motivation was not a predictor. The results revealed psychological well-being, motivation, and life satisfaction are important variables supporting the success in teaching profession.

Many studies discussed the issues of the relation between intrinsic motivation and academic achievement, and explored the use of digital technology (video or multimedia) to enhance subject matter and to support classroom teaching. As for Caldero'n et al. (2020), their study discussed the relationship of a student-centered digital technology approach on pre-service teachers' (PSTs') intrinsic motivation, learning climate, and academic achievement, also they investigated the relations among learning climate and intrinsic motivation as possible predictors of PSTs' academic achievement. They found that the involvement of social media and digital technology into educational processes must be based on pedagogical principles, with the construction of a relevant student-centered and active learning environment.

Hung et al. (2017) explain that the most autonomous forms of motivation, including intrinsic motivation, would lead to adaptive behavior, cognitive, and affective outcomes. They clarify that there is a consistent positive relationship between intrinsic motivation, self-efficacy, and academic achievement.

E-learning has a major role in instruction of students in education, a paper presented in 3rd International Conference on Leadership, Technology, and Innovation Management, Harandi (2015), her hypothesis was: "there is a relationship between e-learning and students' motivation". The study revealed that there is a considerable strength of the relationship between e-learning and students' motivation among students participating in the research. This research was conducted in Tehran Alzahra University, the outcomes of this study have confirmed that e-learning is an element which affects students' motivation. She added that some scholars have predicted that the traditional classroom will vanish soon. E-learning has entered the instruction as well as the corporate world in a main way and it also completes the traditional delivery styles. Also, E- learning is an important device that professors can use to enhance students' motivation and education.

Tarans (2005) as cited in Harandi (2015) discussed in his study on Motivation Techniques in e-Learning 10 techniques (Manding stimuli, Anticipation, Incongruity, Concreteness, Variability, Humor, Inquiry, Participation, Breaks and energizers, Storytelling) for catching and keeping students' attention, which are regarded as the most important elements in obtaining motivation while learning online. Also, in their research showed that improving well programming skills usually needs students to train a lot, which cannot be achieved if they aren't sufficiently motivated. A research model was adopted relating many motivating factors, self-efficacy, and the influence as a result of e-learning system, the results revealed that a well assisted e-learning situation increases learning motivation.

12.2.3   Effect of Technology-Enhanced Learning (TEL) on Motivation and Learning Outcomes

Technology-Enhanced Learning also has a positive effect on the learning outcomes of the students. Costley (2014) recently discussed evidence of the positive relationship between technology and learning expectations. Results show that public and private schools are expanding their technology-enhanced learning and integration. Integration is considered functional in different age groups and learners' styles. Hence, Costly argues that effective technology integration leads to various benefits represented in the increase of student motivation, collaboration, engagement, confidence, practical learning opportunities, and technology skills.

A technology-rich learning environment stimulates learners' motivation. Research conducted in technology-enhanced classrooms indicated that learners who experience technology in their learning process are more interactive and engaged with their learning. This relationship explained that the technology-enhanced learning environment creates a supportive and collaborative setting which results in developing learners' self-awareness and motivation (Li et al., 2010).

There are possible systematic approaches to increase students' motivation by using online technological settings. An empirical study by Keller and Suzuki (2004) focused on the models, which trigger Learner's motivation and technological learning design. Their study expressed the possibility of identifying and increasing motivational requirements of learners in online technological learning settings when applying a pre-identified design and approach. The change was noted with regard to diminishing dropout rates and other positive motivational indicators increase.

However, changes in learners' motivation have been tested with reference to other different factors of online learning. Kim and Frick's (2011) study concluded that the best predictor of learners' positive motivation in technology-enhanced environments was during self-directed e-learning (SDEL). In their study, they referred to the significance of appropriate technology integrated curriculum plan as one of the main factors for e-learning application. Another mediating factor that affects students' motivation is teacher motivation. They argued that motivated teachers can make a real effort in

integrating technological tools in the learning activities; which leads to an increase in the positive effect on students.

In addition to the importance of integrated curriculum plan, teachers' motivation and self-directed methods in teaching, specific devices' integration, as one of the TEL applications, reported an increase in learning aspects. A study by Keengwe et al. (2012) conducted on a 1:1 laptop integration program to enhance the technological environment. The study reported that there has been an increase in student learning, motivation, and self-directed initiatives. The increase was not limited to one type of learner. At-risk students, medium achievers, and high achievers, all showed positive results as an outcome of the technological integration in the learning system.

Teachers believe that students' increase in motivation with Technology integrated learning can be due to several reasons. Liu (2016) conducted a study among elementary school classrooms. In this study targeting 31 teachers, 18 stated different reasons for them to use technology. Several different responses were ranging from 14.8% stating that it met the individual needs of the learners (differentiation and inclusion), to 17% stating it helped with behavior management and routines. The largest set of respondents (31.1%) stated that it helped with student engagement, which led to motivations and helped the teachers to make more literature-based connections that were more entertaining and interesting to students.

An example of integrating technology that caused a change in students' learning outcome and motivation was conducted by Isiaka et al. (2016). The outcome of their study revealed that students that were taught chemistry using computer simulation instructional package (CSIP), performed better than those exposed to computer tutorial Instructional package (CTIP) and also better than the conventional teaching method CTM groups. The CSIP and CTIP were found also to be gender friendly. Moreover, students taught with CSIP had higher intrinsic and extrinsic motivation than their counterparts in CTIP and CTM respectively.

An explanation of this positive effect of e-learning and the learner's motivation lies in the increase of students' active participation and engagement. With the paper presented by Jurkovic et al. (2013), they explained that effective learning for adults or children occurs when they are given opportunities to engage in learning through practical experience as part of the learning process. Learners should be able to test their knowledge via interacting in an enquiring way with their learning context and solve real-world problems. In the twenty-first century, there have been several reports on students' lack of engagement. Research indicates that distance and online learning presents different settings from the conventional classroom, which have to be taken into account to promote learning.

The motivational increase is not limited to a specific type of motivation. With the advent of technology in learning, learners' both intrinsic and extrinsic motivations witnessed a change. Intrinsic motivations included challenge, curiosity, and control. Whereas extrinsic motivations are represented in cooperation, collaboration, competition, and recognition. Ciampa (2014) research revealed that technology, carefully and selectively integrated into the lesson plans, positively impacts the intrinsic and extrinsic motivators for learning. Ciampa's conclusion identified a distinct connection between technology and motivation for student learning. The study correctly

determines that tasks assigned to students must be meaningful, take into account student interest, emphasize mastery, and focus on learning. These factors will help to motivate learners.

12.3 Discussion and Conclusion

12.3.1 Analysis and Discussion

The study data were analyzed based on the previous research, results that were adopted in the study, which are appropriate to the current study and are compatible with it in terms of the study questions.

The results of the study supported the ability and potential of technology-enhanced learning to support students' learning process and achieve the envisaged educational goals and increase students' motivation. Most of the researches have also agreed that achieving the expected goals of activating technology-enhanced learning requires capabilities, resources, tools, and equipment that would facilitate the role and work of technology-enhanced learning.

Technology-enhanced learning has proven its capabilities in education among students who have access to information and the ability to deal with it in a manner commensurate with the educational situation, as the availability of tablets, computers, and equipment is an obstacle to the implementation and support of technology-enhanced learning.

The previously mentioned studies illustrate that the use of technology affects both behavioral characteristics and learning outcomes for the students. They relate the change in the behaviors to the learners' collaboration and increase in self-awareness that result from the correct integration of technology in their learning. Whereas they link the increase of learning outcomes when applying TEL to the learners' individualized needs that might be met with technology, which increases their self-efficacy and performance.

In both cases, most researchers referred to the mediating role of both intrinsic motivation, as in the increase of self-efficacy, self-awareness, and extrinsic motivation, as in teachers' motivation and colleagues collaborative settings, that causes this enhancement in students' behavior and performance. However, they defined some effective requirements that should be available to fulfill the learning outcomes while applying technology-enhanced learning. They suggest that technology integrated curriculum plan along with motivated and skilled teacher is one of the main factors for TEL success. Also, they mention the importance of good-fit devices that suit students' needs and learning requirements. These tools can be considered as pre-requirements pillars of success.

It is evident that technology-enhanced learning has positive results on the impact of student learning, whether in public or private schools, especially with the existence

of effective technological integration, as it plays an important role when all the possibilities and resources available to students and teachers are available alike, achieving results and benefits for the teacher and the learner in the form of increased motivation. Students to learn and cooperate during and outside the educational process, as well as increase confidence, whether in oneself or in the ability to learn, and develop his technological skills and employ them in the service of his learning process.

The educational environment for technology-enhanced education has an important role in increasing its effectiveness, as well as the process of providing appropriate curricula for technology-enhanced education that increases the enthusiasm and motivation of students for education.

12.3.2   Conclusion

The main aim of this study was to investigate the relationship between technology-enhanced learning (TEL) and student motivation. The study relied on theoretical literature analysis to find out the extent to which technology-enhanced learning (TEL) affected students' motivation toward learning. The study showed the importance of using technology to serve the educational process in order to achieve educational goals. It shed the light on the importance of motivation and its impact on student achievement and interaction. Technology-enhanced learning was found to have a positive effect on students' learning outcomes and motivation. This effect has an impact in that students become more interactive and involved in their learning. The reason lies in the increase in students' participation and collaboration which externally motivates and helps them form more exciting bonds with their environment, in addition to the increase in their self-awareness, self-efficacy which allows them to be more intrinsically motivated which appears through their behavioral change and learning outcomes.

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