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The Use of Technology to Continue Learning in Palestine Disrupted with COVID-19

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Abstract: This qualitative study examined how decision-makers and teachers have responded to offer education for all Palestinian students at the immediate onset of the COVID-19 outbreak and how technology is being used to continue education online. Semi-structured interviews were conducted with 20 participants from parents, teachers and decision-makers in Palestine. Interview transcripts were coded using a grounded theory design with a constant comparative method. The findings show that participants identified that technologies such as mobile devices, social media and cloud computing would be useful for design and delivery of educational materials as well as raising safety awareness, and communication during the COVID-19 pandemic in Palestine. The findings also identify various challenges including the widening of the education's digital divide and an increasingly negative attitude towards online education. The data also indicate that the first wave of the COVID-19 experience could be the roadmap for wave two and for the transition to sustainable online learning as a supplement to the traditional learning methods and not as a replacement. This research further demonstrates that teachers who are early adopters have a significant role in influencing both students and other teachers to adopt the transformation to online learning. In addition, the national and international initiatives with a multi-stakeholder partnership could provide sustained, long-term, real solutions for online learning.

Keywords: Online learning, technology, COVID-19, pandemic, emergency remote teaching.

Introduction

On March 4th 2020, UNESCO published the first global numbers of students disrupted due to COVID-19, with 290 million students out of school due to the virus (UNESCO, 2020a). The following day, Palestine closed their doors to traditional school-based learning, affecting 1.3 million students. This trend quickly continued and at the end of March 2020 education had been disrupted for over 1.5 billion students globally (UNESCO, 2020a). Emergency situations require alternative educational solutions for keeping the integrity of schools (Rainey et al., 2016). With the escalation of COVID-19, educators all over the world were encouraged to shift to online and distance education modality as schools were forced to close the educational buildings (Alvarez, 2020; Bozkurt et al., 2020; Daniel, 2020; Zhao, 2020). Extant empirical work highlights online education as part of an overall crisis response protocol to provide schooling (Bozkurt & Sharma, 2020; Rapanta, et al., 2020).

While governments and school leaders advocate for learning to continue online during the COVID-19 pandemic. Little is known about the online learning capacity, especially in developing countries to provide to achieve inclusive and equitable quality education for all students. During a five-step approach to implementing emergency online learning, Rush, et al., (2016) posit that feedback should be gathered from all parties involved in education to learn of what is effective. The purpose of this study is to gain feedback from those involved in online education in Palestine with the COVID-19 pandemic to examine the implications technologies have in supporting education during this emergency situation. The importance of this study is to gather information on COVID-19 from various countries to learn from them to support other countries

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Literature

School Disrupted

Schools have been closed due to various emergency situations, such as past hurricanes, tsunamis, and tornados earthquakes. Pandemics are different biological emergencies in that education is not moved out of the building due to damage to buildings; instead, the focus is on social distancing to increase space between people to reduce transmission of infection (Stage, et al., 2020). Children are thought to be important vectors of transmission (Vinner et al., 2020). Indeed, scholars report that analysis of past studies of severe acute respiratory syndrome, similar to COVID-19, show that the spread of the virus among humans was primarily driven by children (Gog et al., 2014; Vinner et al., 2020). During a pandemic, community strategies, such as school closures can slow the pandemic (Stage et al., 2020) and relieve pressure on health care systems and allow time for the production of vaccines (CDC, 2020). With the COVID-19 pandemic, as early as March 6, 2020, China showed evidence that social distancing can be used to effectively contain this virus (WHO, 2020).

Past scholars have warned about the next great pandemic and that it was highly conceivable that an entire academic year could be lost to “quarantine recess” (Appenzeller, 2005). However, empirical evidence shows that for past pandemics the community at large support unplanned school closures in these situations whether the closure is put in place prior to widespread viral transmission or after the spread has affected students (Agolory et al., 2013; Dooyema et al., 2014; Kiviniemi, et al., 2011). Recent reviews of support for school closure during COVID-19 show a missed response with some parents concerned with health while others struggling to work with children out of school (Garbe, et al., 2020). While the community understand the need for school closures, there are concerns during the COVID-19 pandemic with evidence of the negative effects on the physical and mental health of students due to the social distancing (Leung, et al., 2020); however, the major concern is how can learning continue if students are not attending school.

Emergency remote teaching

The untimely global pandemic crisis caused by COVID-19 has forced educational institutions, especially in developing countries, to prematurely learners into an emergency remote teaching (Alvarez, 2020; Bozkurt & Sharma, 2020; Daniel, 2020).

Bozkurt & Sharma (2020) reported three practical considerations for the implementation of an emergency remote teaching. First, since emergency remote teaching is an obligation, different strategies and approaches should be used according to the different priorities and situations taking into considerations many variables, including target group, age range, technological infrastructure, and social and economic context before the implementation process. Second, use terms carefully and intentionally. Shifting to emergency remote teaching is a temporary solution and it is unlike online distance education. While emergency remote teaching involves simply uploading educational content, the online distance education is a complex that requires careful planning, designing and determination of aims to create an effective learning ecology. Bozkurt and Sharma (2020) argued that using the wrong definitions will make more errors to prove the effectiveness of distance education on the long run. Third, focus on the emotional presence. during times of crises, delivering content is not the only issue of concern, caring and empathy in such times is also important.

Although emergency remote teaching during COVID-19 crisis provides learners with an opportunity for continue education through an online platform, there are many challenging for engaging in educational processes effectively. The most challenges cited in the literature is digital divide with some students not having resources or the digital skills to download and operate the programs (Alvarez, 2020; Bozkurt et al., 2020; Daniel, 2020; Rapanta et al., 2020)

Online Learning

In these emergency situations, the development of online learning as a replacement for face-to-face learning is the most efficient and cost-effective method to continue learning and should be part of a school's overall crisis response protocol (Bozkurt & Sharma, 2020; Rapanta, et al., 2020). The Internet and mobile networks are crucial modes of communication during emergencies (Atten, et al., 2011; Majchraz & Moore, 2011). In a thorough review of the literature of pandemic policies and practices, Uscher-Pines et al. (2018) found that there were no strategies on how to safely continue learning through face-to-face methods while trying to use social distancing. Two choices are presented to schools during the COVID-19 pandemic; 1) ceasing all instruction, or 2) using mobile phones and Internet access to deliver instruction online (Butcher, 2020).

Online learning allows teachers to continue teaching students, with a variety of online tools (Almaiah, et al., 2020). Plans should be made to transition online before emergency situations arise (Bozkurt & Sharma, 2020; Rapanta, et al., 2020). In the case of COVID-19, it appears that few countries were prepared to transition students online, in particular developing countries, such as Palestine that rarely use online learning due to the perception that it is not an effective learning approach (Shraim, 2012). Scholars have delineated emergency strategy plans for rapid development of emergency online schools that have not developed prior plans (viz., Rush, et al., 2016).

Rush et al. (2016) five step plan involves:

- Stage 1: Appraisal of school operations and community needs
- Stage 2: Key considerations for development and implementation
- Stage 3: Garnering resources and supports
- Stage 4: Outreach
- Stage 5: Execution, maintenance, & reintegration

In the case of the COVID-19 pandemic, in stage one, it was identified that school buildings cannot be accessed, and learning needs to be continued online. Stage two would have school leaders and educators assessing the online implementation and if students have access to computers and Internet connectivity which is not necessary readily available. In stage three online resources are sought. Butcher (2020) posits a partnership strategy with existing virtual learning providers rather than creating new virtual platforms. Stage four is keeping everyone informed of the online plan, including students, caregivers, and the general community. Stage five is the execution of online learning, maintenance and reintegration. In this stage, it is essential that feedback is obtained to determine the efficacy of the online learning strategies.

Feedback is crucial in determining not only how the emergency online schooling is achieving goals of providing instruction during this time. It is also crucial in understanding what changes are needed during the first wave of COVID-19. Scholars also report that we need information to inform practice during the second wave of COVID-19 (Anderson, at al., 2020; Leung, et al., 2020) that will disrupt learning again. Scholars postulate that many investigations, while informative, only provide information after schools are reopened (Epson et al., 2015; Russell et al., 2016), which is unhelpful in informing the current situation and could also result in recall bias (Rainey et al., 2016). Therefore, it is essential to gather immediate feedback during this current first wave to provide formative data to support immediately and during the predicted second wave.

Purpose of the Study

The purpose of this research is to study the emergency online learning strategies in Palestine gathering feedback from parents, teachers and decision-makers to provide information to educational leaders, policy makers, educators, and parents to support the efforts for COVID-19's possible multiple waves and future pandemics or any other emergencies in Palestine and other developing countries.

The research questions guiding this study are:

1) How were technological tools used to mitigate the effect of coronavirus on the Palestinian educational system?
2) How important are emerging technologies in responding to the COVID-19 outbreak?
3) What are the main challenges in implementing online education during the COVID-19 outbreak?
4) Will the COVID-19 emergency lead to change in the education system and a sustained increase in the mainstream adoption of online learning?

Methodology

Research Design

The current study is a qualitative study, involving semi-structured interviews. After 20 days into the closure of schools due to COVID-19, the researchers conducted semi-structured interviews for 25-40 minutes with the 20 participants. Interviews were held online due to the state of emergency. Participants were asked six major questions related to main concerns regarding schools closure, actions taken, perception of using technology, the type of technologies used during COVID-19 outbreak, major challenges and considerations required to shift to online education. The interviews were audio recorded and manually transcribed. These data were then coded using grounded theory design.

Participant Population

This study involved a total of 20 participants made up of seven teachers working with K-12 students, seven parents, and six decision makers. (two policymakers from the MoE, two district directors, two school principals). This was a convenience sample selected from different districts (Nablus, Qalqilia, Bethlehem, Ramallah,Gaza) in Palestine. Participants were eight females and all participants were between the ages 25 to 55 from Palestinian districts.

Study Context

The President of Palestine announced a state of emergency on 5 March 2020, closing all schools in both the West Bank and Gaza. This affects 1.3 million students and 70,500 teachers in 2885 schools run by the government (2095 schools), the United Nations Relief and Works Agency for Palestine Refugees (UNRWA, 349 schools), and 412 private schools. Although the education system is frequently interrupted by the ongoing conflict in Palestine, online education has not been widely accepted by many policymakers (Shraim, 2012). However, after deliberation with actors and partners, the Ministry of Education (MoE) announced March 10 that schools would move to online education as the main approach to keep students engaged with the learning process during school closures (MoE, 2020 March 9). Policymakers afforded districts and schools more flexibility with their resources and expertise to deliver online education. Online education was optional for government schools, but private schools decided that it would be mandatory for all students.

The MoE specified that schools use various technologies for:

1. The well-being of students and teachers, who should all be encouraged to use any appropriate technology for psychological support, to raise safety awareness through

competitions, and to encourage students and their families to help reduce the spread of COVID-19 in Palestine.

2. Lower schools (preschool to 4th grade) should focus on making learning fun through PowerPoint, animated video presentations, songs, worksheets, drawing, games, and YouTube videos.

3. Middle and upper schools (5th to 11th grades) should create Facebook groups and teachers should develop lesson plans according to grade and subject, uploading assignments, worksheets, materials, pictures, and videos.

4. For higher secondary (Twajihi; 12th grade) students, each District of Education should create a YouTube channel to upload videos recorded by teachers in different subjects.

Schools, teachers and students are using their own Facebook pages and YouTube channels in addition to the national e-School portal (MoE, 2020, March 30). Teachers and students in the Gaza Strip are further using the Rawafed online educational portal, UNRWA's Interactive Learning Program, and Voice of Education Radio (UNESCO, 2020, April 12). Communication among all stakeholders, including decision-makers at all levels, teachers, students, and parents, is via Facebook and WhatsApp, as these are the most popular social media in Palestine (Hamleh, 2019). They are used to share information, post opinions, and discuss issues surrounding the current outbreak of COVID-19. ZOOM is also being employed for virtual meetings.

The MoE is working closely with its partners to monitor the situation and take appropriate steps. On 2 April, the MoE decided to cancel all testing for the 2019-2020 school year, except the Tawijhi examination, and that all teachers will cover the essential topics by traditional face-to-face teaching at the beginning of next year (MoE, 2020, April 2). The MoE has also collaborated with Al-Quds Open University and the Palestinian Broadcasting Corporation to launch an Online Secondary initiative, broadcasting live lessons via YouTube, radio, and television to deliver a more rigorous schedule of daily online classes for 12th grade students. Various applications such as Zoom and Google Hangouts are also being deployed to connect students and teachers (MoE, 2020, April 2).

On April 1st, 2020, the MoE and UNESCO established the Taskforce for Distance Learning. The objective of the Task Force is to establish partnerships, mobilize funds, coordinate different interventions of partners and compile online resources (UNESCO, 2020, April 12). Finally, the MoE has recently launched an interactive online platform called Ta'mmol (Reflection), focusing on enrichment and extracurricular activities to keep students learning, rather than on teaching. This initiative will help students to stay connected with their teachers, to invest their time properly in developing their skills in using technologies for problem solving, and to develop cognitive learning. It will also motivate students for self-study and develop their adaptability to face any future emergency (MoE, 2020, April 2).

Data Collection Tools

In this study the researchers used the semi-structured interview as a tool for the collection of data. The "interview guide" was designed and used for the semi-structured interviews. Six main questions emerged from the main research questions. The questions are open-ended using Arabic language to be easily understood by interviewees, related to their own experiences, and opinion about how they have responded to offer education for all Palestinian students during COVID-19 outbreak and how

technology is being used to continue education online. All interviews followed the interview guide to ensure the reliability of the entire study. However, the questions were modified in their wording to appropriate the interviewees' role (decision-makers, teachers, parents).

During the interviews, the researchers used prompts to encourage the interviewee to consider the question further to get a complete picture of the experiences of different participants. For example, school decision-makers were asked questions, such as:

- What is the new approach for continuing education?
- How do you perceive the use of technology for raising awareness, communications and teaching as a feasible alternative?
- Did you develop an emergency plan to provide meaningful, relevant educational services to all students?
- Does the plan cover all levels of the whole education sector**?**
- Do you feel that schools ready to shift to teaching remotely in short time?

Additional probing questions were used to gather further information from what the interviewee had provided. These include asking for explanations to further details about the participants thinking or evidence where possible.

Individual teachers were asked questions, such as:

- How do you believe technology can support students affected by coronavirus measures?
- How are you communicating with parents and students?
- How are you developing digital material?
- How are you delivering online material/ teaching remotely?
- Which technological tools do your students see as being significantly effective in delivering education services?

Further probing questions asked about specific social media, mobile apps, web tools, that are used

Individual parents were asked to describe their experiences in teaching their children online, with questions such as:

- What are the usefulness of using technology for raising safety awareness?
- What are the usefulness of using communication and delivering content?
- What are the main challenges facing them in supporting their children?

Probing questions asked about technological infrastructure at home, schedules etc.

Data Analysis

Each interview transcript was coded individually using a grounded theory design with a constant comparative method (Strauss & Corbin, 1998). From the 20 interviews, the statements were open coded to identify important words or groups of words from the data. In vivo codes were also selected as the researchers' language provided appropriate descriptive coding terms (King, 2008). It was an iterative and inductive process. The initial codes led to intermediate coding and the constant comparison of data of interviewee perceptions with interviewee perceptions, of interviewee perceptions with codes and of codes with codes. The codes were deemed to be theoretically saturated once all the research purposes fit into one of the categories.

The coding of the research methods was based on the method reported by the researchers in their methodology section. To determine the labels, “in vivo coding” (Saldaña, 2013) was conducted using the researchers' terminology. The using technology during COVID-19 outbreak was coded as positive

and negative perceptions. The key challenges relating to the implementation of online education were coded into (e.g., digital divide, negative attitude). The considerations to online learning transformation were coded into the roles of actors in the three levels (teachers, national and international). The stakeholders were coded according to their educational responsibilities (e.g., decision-makers, teachers and parents). Finally, the types of technologies were coded by the term used by the researchers e.g. mobile devices, social media and cloud computing.

Findings and Discussions

From the interview data, the grounded coding revealed three overarching themes. The first theme is the perceived usefulness of using technology in responding to the COVID-19 crisis in Palestine in terms of raising safety awareness, communication, and the design and delivery of educational materials. The second theme is the perceived challenges facing decision-makers, teachers, students, and parents in the switch to online education in terms of the educations' digital divide and the negative attitude towards online education. The third theme is the commitments of transformation to sustainable online learning from teachers and decision-makers at the national and international levels. These three themes structure the organization of the findings and discussion section.

Perceived usefulness

All participants have signified that technologies such as mobile devices, social media and cloud computing are available to the Palestinian and would be useful and appropriate for raising safety awareness, communication, and the design and delivery of educational materials.

Raising safety awareness

All participants perceived the usefulness of technology in raising safety awareness during the school closure by giving all school-age learners the opportunity to participate in extra-curricular activities involving the use of technology to design a solution for reducing the transmission of COVID-19. The MoE announced several competitions such as ‘My Daily Life in the Time of COVID-19’ and recently launched an interactive platform called Ta'mmal (Reflection). Students are employing various technologies in different ways, such as using mobile devices (smartphones and tablets) to search for reliable health resources and to make videos for psychological support, creating posters on avoiding the risk of infection from free infographic apps, making podcasts on the coronavirus, creating a film about staying safe online, or writing short stories. Students with no internet connection are encouraged to write or draw their ideas using pencil and paper, then ask parents or friends to upload photographs to a Facebook group. Although these students have no opportunity to interact directly with their teachers and fellow students, this allows them to participate minimally. One decision-maker expressed the view that “these initiatives show clearly how the application of technology is helping students to develop their skills in research and enquiry, independent learning, collaboration, and interactivity”.

Some parents remarked that children were enjoying spending more time using various kinds of technology to design activities for the competitions, whereas they found that using technology to do their assignments was boring. These activities were perceived as important in teaching children how to stay safe in an attractive way, thus improving their knowledge and understanding and so reducing their anxiety. A science teacher gave some new examples of thinking outside the box by linking learning with reality. She encouraged her students to enact their social responsibility by designing sterilization materials to reduce transmission. They were using various technologies to search for resources, watch videos, and communicate with each other (e.g. via WhatsApp), thus strengthening discussion, interaction, and reflection. Utilizing various kinds of technology in such awareness-raising activities has proven their usefulness for building lifelong learning, if used effectively in teaching and learning. This means radically rethinking ways of using technology to meet students' needs. This

finding is consistent with that of Zhao (2020) who confirmed that COVID-19 disruption can inspire school leaders to reimagine education in terms of today's context and tomorrow's needs from the perspectives of the learners instead of the curriculum.

Communication

Using Internet and mobile networks for communication among all educational actors are critical, especially in an emergency (Atten et al., 2011; Majchraz & Moore, 2011; Bozkurt et al., 2020). All participants valued social media (Facebook and WhatsApp) as a useful means of interactive communication among interested parties. The decision-makers remarked on the high level of interaction among different stakeholders on the Ministry Facebook page during the school closures. This is an open dialogue platform for interested parties who are more knowledgeable of local communities' needs. In practice, this entails meeting their diverse and changing needs, expectations, and requirements, which helps to raise awareness among a broad range of interested parties and reach consensus, thus facilitating the successful implementation of online education. Teachers reported the usefulness of the Facebook, WhatsApp, and Imo apps to communicate guidance and critical information to students and parents very flexibly, as messages can be short and quick. Some teachers also used Zoom for virtual meetings with their students. This result reflects those of Bozkurt and Sharma (2020) and Rapanta et al. (2020) who also underlined that teachers must open a social presence through social communication tools to maintain and possibly enhance the lost spontaneous student-student and student-teacher interaction. Parents expressed mixed opinions. Many noted that social media were keeping students connected with their teachers and peers, reducing isolation and frustration while strengthening teachers' relationships with students and their parents. Others, however, were concerned that Facebook use could be addictive, distracting, and time-consuming and that it endangered their children's online safety.

The use of social media platforms such as Facebook by a large and growing number of stakeholders has the potential not only to inform practices for keeping people safe and taking precautions about the potential "second wave" of COVID-19 infections (Anderson et al., 2020), but also to facilitate the adoption of online education if used effectively for communication and raising awareness of the importance of online education. Almost all of teachers perceived the usefulness of social media especially Facebook for teachers, students and their parents to share tips, best practices, guidelines, request or offer help in the local communities and on the global " keeps local and global communities in-the-loop and connected during this time". This will facilitate the acceptance of global trends towards the online education.

Design and delivery of educational materials

Internet and mobile phones are widely utilized by schools all around the globe to deliver instruction online during the COVID-19 pandemic (Butcher, 2020). All decision-makers agreed that technology was important in delivering education services as a rapid emergency response. However, they saw moving to online education as no more than an optional and temporary alternative to traditional education, because students are easily distracted, teachers are not sufficiently trained, and the infrastructure is not well developed; therefore, "we should be careful about the effectiveness of the online education modality when implemented in such emergency circumstances".

There was no consensus among teachers regarding the usefulness of online education. Those with significant experience of integrating technology into their teaching practice tended to perceive online education positively, while their less experienced colleagues were not convinced. This finding is similar to one reported by Fox (2004) from a past study. The experienced teachers felt that they could benefit in several ways from using technology in designing and delivering online materials. Integrating various technologies in developing online activities would improve their teaching practices and strategies. Using special mobile apps such as Augmented Reality(AR) and Virtual Reality(VR) apps in teaching Chemistry, Podcast in teaching Arabic and English languages, Padlet for reflections, Khan

Academy in teaching Science and Maths, Google form and Kahoot for formative assessments through quizzes and quick question polls and Podcast in teaching literacy skills (reading or spelling) For Arabic and English languages, using video, camera and audio recorders to document learning (e.g. of speech and cognitive development). Using mobile apps made learning more enjoyable and facilitated personalization (Shraim, & Crompton, 2015), while cloud computing such as Google drive could be used for storing, organizing, and sharing material with their students and colleagues. Teachers also perceived social media as useful for synchronizing lessons via Zoom, Google Classroom and webinars and to facilitate the incorporation of varied media (e.g., print, photos, graphics, audio, video, or live streaming).

Another important benefit of social media highlighted by teachers was its use in building networks of teachers for sharing ideas, technical support, and best practices. Others reported that the use of technology had helped them to develop their IT skills such as in creating multimedia, operating YouTube channels, conducting online exams, and running live lessons. Many teachers underscored that designing online activities in an emergency requires careful attention, as students are in a very desperate and time-sensitive situation and they had to personalize their instruction to the individual student's needs. Many teachers have taken the opportunity to access many resources which are offered free for a limited period during the COVID-19 emergency. There is no dishonour in teaching through usable Open Educational Resources that prepared by others (Daniel, 2020). These resources are well-designed resources that seem to have the advantages of adaptability to diverse learning styles and of integrating new educational practices.

Teachers with limited IT skills were not satisfied because they were not prepared to teach online. They were more likely to use only social media such as Facebook and WhatsApp to send assignments, worksheets, and selected links to students and their parents. They used these few tools for passive content consumption, not for learning. Social media can, however, be used to support a social constructivist approach and to facilitate student-centered learning (Shraim, 2014). Teachers need training in how to use these tools to engage in collaborative activity, knowledge sharing, reflection, and debate with their students and fellow teachers.

The usefulness of online education from the parents' perspective is that it could make students more independent, improve their IT skills, deepen their understanding through reflection and interaction, and strengthen the parents' sense of responsibility. However, these advantages depend on teachers' practices and competencies. Parents reported that not all teachers understood how to teach in this situation; they were offering students fun and enjoyable learning, with little focus on meaning, by simply watching a mix of educational and entertainment videos on mobile devices or computers.

Challenges

Shifting to online education as a response to the COVID-19 emergency has exposed a number of challenges specific to the Palestinian context, including a widening of the education's digital divide and an increased negative attitude towards online education. These problems exist under normal circumstances for most countries, especially developing ones, but become increasingly prominent in an emergency.

The widening of the education's digital divide

It is widely believed that the online modality has the potential to maintain education in emergency situations. Since not all students have access to quality interactive content, the term 'education's digital divide' has often been used in discussing equity and inclusion for students in terms of not having the financial resources (UNESCO, 2020c). Decision-makers, teachers, and parents reported many instances of the challenges they faced in providing online education for all students during the crisis in Palestine, related mainly to accessibility and preparedness to develop quality interactive content.

Accessibility -Accessibility and connectivity were major concerns on which all participants agreed, for many reasons. First, not all students and teachers are able to connect computers or mobile devices to the reliable internet at home and the current quarantine and movement restrictions make it impossible for them to visit friends, internet cafés, or public places to gain internet access as they did during earlier emergency situations.. Another accessibility issue mentioned by one parent was that households in Palestine are typically large and "sharing one laptop for up to six family members is not realistic, especially as my wife and I are also working from home". The alternative, for each person to have a device, is not affordable for most families in Palestine and other developing countries. Also, the spaces available at home may not allow every child to have a space to interact with online learning effectively. Often times, online lessons coincide for more than one child in the same family. The teachers were also concerned about internet bandwidth. The average existing bandwidth in Palestine is 16 Mbps, which may not be robust enough to cope with working and teaching remotely, while recorded or online lesson videos are subject to interruption due to slow computers, slow loading, and poor network connectivity. This "just makes you frustrated and discouraged as the server crashed many times due to slow downloading". The result is poor engagement in online learning activities. Another accessibility issue highlighted by decision-makers was that not all government schools have been ready to respond to this sudden change and there is considerable diversity among them—and indeed among students and teachers—in implementing the online education modality. Decision-makers also remarked that while shifting to online education is optional for government schools, it is compulsory for all teachers and students in private schools. Therefore, wealthy children have more opportunities to take full advantage of online education during the full academic year, while students in rural areas and refugee camps lag behind. These results are in line with recent studies (Alvarez, 2020; Bozkurt et al., 2020; Olcott, 2020; Rapanta et al., 2020) indicating that accessibility and connectivity of the Internet are still the most important challenges for many developing countries.
There is an agreement between the MoE and the Palestinian Telecommunication Group (Paltel) to provide free internet connections to all public schools (MoE, 2020). It is very important that telecom companies express their cooperation by taking social responsibility for connectivity in times of crisis, but this service is unlikely to be provided to all homes of students and teachers, even in an emergency, let alone under normal conditions. Participants did not think that this was possible. The MoE should explore more partnerships with local mobile and telecom operators for low-cost access to basic internet services, especially for marginalized students. A global coalition such as UNESCO could put strong pressure on companies to provide access everywhere in the world at minimum prices.

Teachers' preparedness to develop quality interactive content - The effectiveness of online education depends on teachers' competence in designing and delivering the learning materials, a process which takes time and requires collaboration with individuals such as instructional designers, media specialists, and online learning specialists (Hodges et al., 2020). Developing digital materials at short notice is particularly challenging for teachers with limited IT skills (Bozkurt et al., 2020). Teachers reported having to gather resources from a variety of sites that are often not culturally compatible with the Palestinian context, resulting in students feeling detached and distracted. Plenty of online materials and resources had been provided to students and their parents for home study; however, these supported teaching rather than learning, the quality of the content was poor because teachers used a variety of sources which had not been evaluated according to online quality criteria, infrastructure requirements were not considered, not all students could access the materials, and searching for good resources proved time-consuming for students and parents.

Almost all participants also noted that teachers varied in their preparedness. Some were better prepared than others to integrate technology into their teaching practice and not all were ready to teach remotely. This result is consistent with findings of other studies (Alvarez, 2020; Bozkurt et al., 2020). They were unfamiliar with using educational tools such as multimedia and dealing with

technical problems while running synchronous lessons. Although almost all teachers used their mobile devices for social media, particularly Facebook and WhatsApp, in their daily lives, most lacked experience and knowledge of integrating them into their teaching activities (Shraim, & Crompton, 2015). Further, specific training in pedagogical strategies, instructional design and quality standards is needed in order to develop their skills and competence in effectively designing and delivering online activities (Shraim, 2012). In the short term, the MoE should initiate short online training episodes for teaching teachers, students, and parents in using selected educational technology tools. While social media are useful in delivering materials, it is important to set up an interactive online platform to collate resources for teachers, students, and parents, selecting curated free tools, strategies, tips, and best practices for teaching online.

Interaction is a major concern when designing online materials and activities. A failure to engage students in online learning may be due to limited access to the internet but may also arise from their lack of motivation for self-study (Shraim & Khlaif, 2010). An IT teacher said: “I have worked hard in making videos, creating assignments, and going synchronous or asynchronous with my students. I expected strong interaction with all of them …. but I am surprised by students’ apathy and lack of engagement and interaction.” She estimated that only between seven and ten students in a class of forty were engaged and added that “teaching online is completely different from face-to-face and teaching from home in these circumstances is a challenging experience”. Since, the situation is not normal, students are longing for affective or emotional support (Alvarez, 2020). So, learning should not be highly regarded as a matter of grades and content-based, but pedagogy of compassion and care must be present all the time (Bozkurt & Sharma, 2020). It is also important to maintain learners’ interest in learning by giving them varied assignments addressing all aspects of the current COVID-19 crisis in a wider global context (Daniel, 2020).

Parents’ responsibility for teaching their children is a crucial aspect of the emergency situation. Many have found it difficult to adjust to the rapid shift to homeschooling because they lack time or technological skills. One parent, a university professor, reported that he could not support his children: “My kids cannot study on their own … It is a heavy burden to teach them while doing my work remotely”. Such children will feel frustrated, bored and isolated from their usual leisure activities. He added “school not only a place of learning, but of socialization and friendships”. This makes it urgently necessary to develop online orientation sessions to support students, teachers, and parents by preparing them for the shift from the traditional school day to organizing themselves in the digital space while confined to their homes.

Negative attitudes towards online education - This research has found that moving quickly to online education has increased negative perceptions among stakeholders in terms of misconceptions and poor planning. Misconceptions regarding the terminology of online education has caused confusion in implementing it and fostered negative perceptions among stakeholders of all kinds, including decision-makers, teachers, students, parents, and the wider community, hampering the acceptance and adoption of online education. This study has found that there is no common understanding of the terminology or methodology of online education, because it can be seen from a variety of perspectives and dimensions, being referred to as online education, distance learning, e-learning, blended learning, online learning, mobile learning, and virtual learning, among other terms. Teaching remotely is completely different from online learning and distance education, so the misconception that they are identical leads to a failure to understand the requirements for successful implementation (Bozkurt & Sharma, 2020; Hodges et al., 2020). Bozkurt & Sharma (2020) caution that using the wrong definitions will make more errors to prove the effectiveness of distance education on the long term.

The results suggest that COVID-19 could be a turning point for reshape education through digital inclusion. Therefore, it is imperative to have a clear vision of the concept of technology-enhanced

learning that is appropriate for the Palestinian context. The introduction of full online education would be not appropriate for K-12 students not only for the Palestinian but also around the world. It is imperative for online education to be seen as a supplement to the traditional learning methods and not a replacement (Shraim & Khlaif, 2010).

The second misconception is poor planning. Emergencies require rapid responses, so online education should be integral to the MoE's strategic planning, not only during the current pandemic but also whenever schools have to be closed in a crisis, such as the ongoing conflict in Palestine. One teacher said that they expected " decision-makers to be proactive, rather than reacting to sudden and sometimes disruptive changes", while a majority of participants expressed the belief that the lack of a plan to guide teachers, students, and their parents in moving to online education had caused confusion in the implementation and consequently increased the negative perceptions of all stakeholders. Therefore, during the emergency phase, short-term plans for the urgent provision of services should be based on the results of a rapid assessment of stakeholders' needs, taking into consideration necessary modifications of formative evaluation to reflect the changing circumstances.

Almost all teachers found online teaching stressful and lacked confidence in their ability to deliver it, fearing negative consequences because of the very poor quality of material which had been designed and developed in haste, without training or technical support. They felt the additional burden of pressure to deliver learning in a time of crisis as well as to support their students' emotional needs. The results of this urgent implementation of online education lead in turn to the stakeholders developing negative attitudes towards online education. Therefore, a more organized effort to raise the levels of digital literacies of teachers, including how to support learners on the socioemotional level is needed (Bozkurt et al., 2020).

A notable cause of negative perceptions of online education among parents was the messy in delivery of materials on social media. Among the most common cybercrimes in Palestine related to social networks is cyber-extortion, which is particularly widespread among teenage girls (Kshetri, 2013). Local culture and social norms make most of its victims feel afraid to talk about this issue to their families. Decision-makers argued that dropout rates among girls might therefore be increased by their parents' concerns about their online safety when using social networks more heavily.

To sum up, the results of this study were based on the five-step plan proposed by Rush et al. (2016) describing the implementation of emergency online learning during the first wave of COVID-19 crisis as in Figure 1 below. This study has found that the urgent implementation of online education without the normal planning, training, and support has caused chaos and confusion for stakeholders. However, it has helped countries, especially developing ones, to highlight the challenges facing decision-makers, teachers, students, and parents in the switch to online learning; furthermore, it has given them the opportunity to determine the requirements of transformation to sustainable online learning and to identify ways to bridge disparities in the acceptance of online learning, not only among teachers and students in Palestine but also between developed and developing countries.

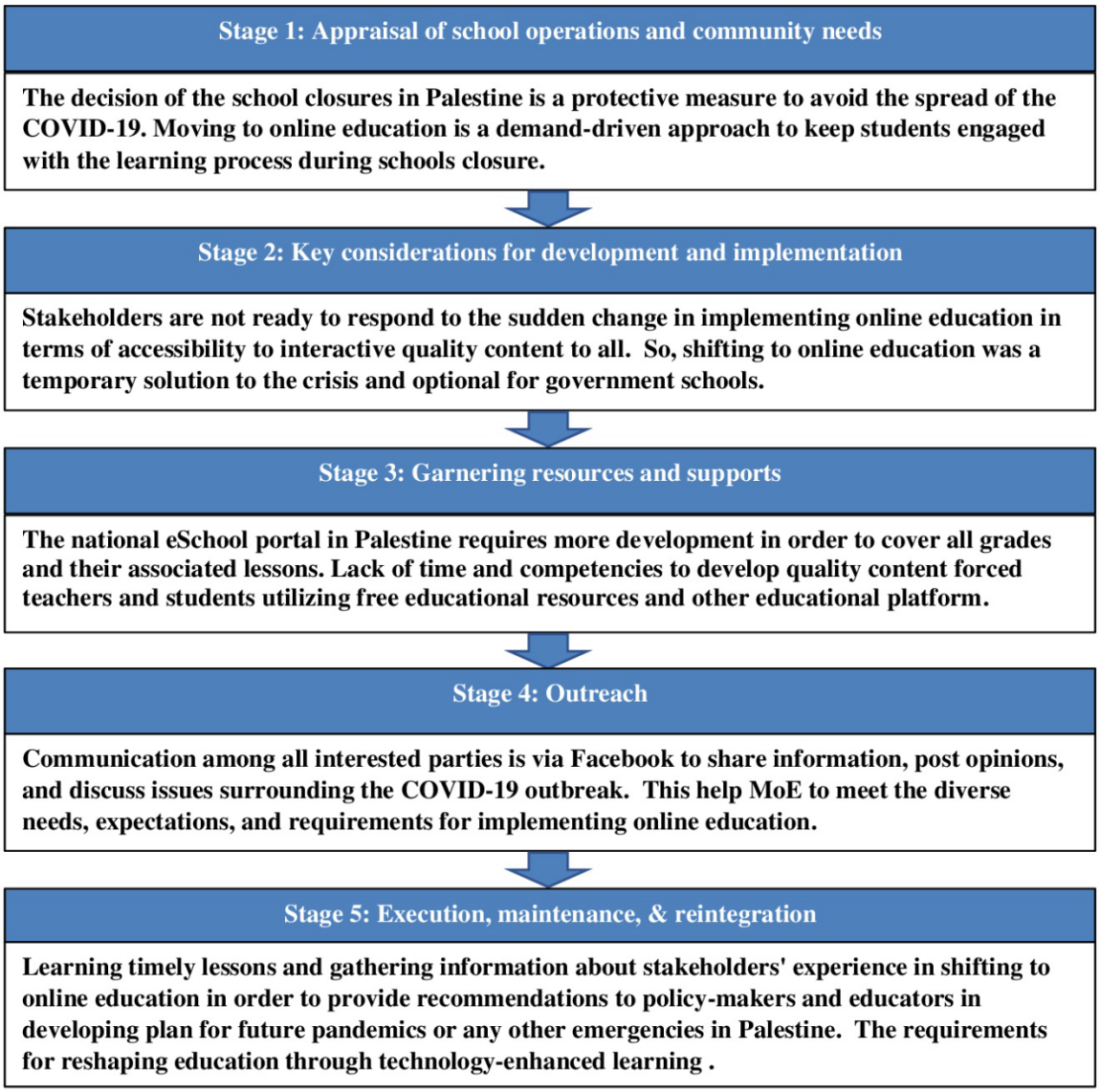

Fig. 1. Five-steps plan proposed by Rush et al. (2016) for implementing emergency online learning

Transformation to sustainable online learning

Online learning is a demand-driven approach to coping with the disruption of education by the COVID-19 pandemic. The first wave of the COVID-19 experience could be the roadmap for the transition to sustainable online learning. Making the change to online learning requires considerations of critical factors by teachers and decision-makers at the national and international levels.

Teachers' role

Most teachers reported having benefited from access to well-designed educational resources that enriched their pedagogical strategies and practices and developed their IT skills. Teachers, especially the early adopters, should therefore retain the skills acquired at this time by participating in national and international initiatives and networks. The most obvious advantage of these networks lies in the building of online communities to collaborate and share knowledge and best practices with teachers around the world to provide efficient and meaningful learning processes (Bozkurt & Sharma, 2020) .One female teacher in the West Bank village of Jinsafut, who has participated actively in several IT competitions, raised the importance of international initiatives to bring people around the world together to share responsibility for solving the problems of their communities. She described a global

initiative entitled ‘Challenge: Combating COVID-19’, which invites students aged 13 to 17 years from all countries to join Launchpad, an online collaboration platform where participants can work in teams to design technology-based solutions and integrate AI to slow the spread of COVID-19.

The example of Launchpad illustrates two important things. First, it is an exciting opportunity for girls from Arab countries to engage constructively in global sustainable development while remaining at home, as Arab culture prevents many of them from traveling abroad. Second, the need to explore and integrate AI in K-12 education and benefit from the promise of “artificial intelligence for all” that each student can take advantage of the technological revolution under way and access the innovation and knowledge generated.

A sustained increase in the mainstream adoption of online learning is evident from the large numbers of adopters (Tam & El-Azar, 2020). Teachers who are early adopters on the innovation curve (Rogers, 2003) will respond quickly, but it cannot be expected that most teachers will be rapidly convinced by online learning, so early adopters have a significant role in influencing both students and other teachers to adopt the innovation, through building interactive networks at national and international levels.

National advocacy

Large-scale, national efforts to utilize technology in support of online education during the COVID-19 pandemic are emerging and evolving quickly. The majority of participants expressed the view that the transformation to online learning in Palestine would depend on the MoE providing the resources required to create an enabling environment, by declaring a clear strategy and policy, raising awareness, delivering training, and improving the infrastructure (Shraim, 2012; Olcott, 2020).

Raising awareness

This study has shown that decision-makers are shifting to online education as a temporary solution to the crisis. The research has revealed the need to start by making decision-makers aware of online learning potential value in improving access to quality education for all students. Therefore, raising awareness at top management level of the need to accept these initiatives is the first important prerequisite for ensuring the adoption and implementation of online learning (Shraim, 2012).

It will be also necessary to raise awareness among all stakeholders to facilitate wider adoption and bridging of the gap between the early adopters or visionaries and the early majority or pragmatists, somewhat more reluctant to accept online learning, thus increasing the rate of diffusion. One valuable finding of this study concerns the usefulness of social media, especially Facebook pages that offer a platform for interactive dialogue, thus making stakeholders increasingly aware of the advantages of online learning and building bridges of communication among stakeholders.

Building a network of public-private partnerships

The success of online education rests on the social value of community participation. The involvement of a diverse range of bodies can build support in the community, expand the user base, and enhance sustainability by contributing to the bridging of the gap referred to above, thus reaching a majority of potential adopters. It is anticipated that considerable capital investment will initially be needed and that the financing of an improved ICT infrastructure and enhanced capacity will require links to be forged with international and local communities and dialogue to be maintained with multiple groups (Shraim, 2012). There is therefore a great need to launch national coalition and strengthen shared commitment and social responsibility as all partners work together to narrow the education's digital divide.

Infrastructure

The availability of strong digital infrastructure contributes to the overwhelming success of digital learning in these hard times of COVID-19 (Abdulrahim & Mabrouk, 2020). Infrastructure enhancement is among the most important challenges to the implementation of online learning in Palestine (Shraim & Khlaif, 2010). In an era of rapid technological change, the MoE should be investing in the latest technologies available for online learning. Therefore, the Ministry must have a clear plan for upgrading the infrastructure, with a focus on the most marginalized, those who do not have access to technology or who do not have a supportive home environment, in order to reduce the digital divide (UNESCO, 2020d).

Participants recognized the value of digital materials for motivating students. The MoE in Palestine spends millions of dollars each year on printing textbooks and parents complain of the weight of the schoolbag. The Ministry would benefit from the cost-effectiveness of digital textbooks and interactive materials including videos, infographics, animations, audio podcasts, websites, blogs, wikis, games, slideshows, virtual and augmented reality applications, mobile apps, and open educational resources with multimodal enhancements so that teachers can adapt them to the needs of their students (MGIEP, 2019). The existing cost of printed textbooks could be allocated to the purchase of computers and devices from which student would benefit during several years of schooling. At the same time, a focus on marginal students, in addition to fulfilling the social responsibility of partners, could be expected to contribute to reducing the digital divide.

Training

Teachers reported that they had not had sufficient training to move immediately to online learning. Delivering the necessary training programs seems to be another challenge for the MoE, due to time and financial constraints during the emergency, making it difficult to deliver traditional training programs in specific places. An important response highlighted during the interviews was the suggestion that online professional development would be cost-effective, so teachers should be encouraged to take advantage of such provisions, which should be well-resourced for using different kinds of educational technologies tools, online instructional design, new pedagogical strategies and the basic concepts of psychosocial support.

Several projects do appear to have achieved progress in introducing new technologies to enhance the accessibility and quality of the teaching-learning process in Palestine, but they lack integration and have not been followed up sustainably. If online learning is to be successfully implemented on a large scale, a centralized model, typical of relatively mature institutions, would deliver higher efficiency and better integration of online learning services. This underlines the need for a national body to regulate the design of innovative online learning materials meeting international quality standards, to deliver training, to ensure value for money by avoiding waste, and to implement initiatives that have been successfully trialed (Shraim, 2018).

International advocacy

There is a growing worldwide commitment to achieve the 2030 Sustainable Development Agenda (SDG 4). However, progress has not been as rapid as anticipated, particularly in developing countries due to emergencies such as wars and pandemics. The current research has highlighted that the COVID-19 pandemic is a crisis involving unparalleled disruption of education on a global scale and the need for online alternatives to maintain teaching and learning during the emergency and beyond. The link between online learning and the SDG4 has been translated meaningfully into innovative action during the coronavirus crisis. Almost all participants reported that the crisis had forced the majority of educational institutions to respond quickly by switching to online modalities. Participants also explored the value of using online education as a demand-driven response to the global challenge of meeting the SDG 4. One decision-maker asserted that a significant task of an international intervention should be to mandate all nations to engage in implementing online learning.

Another important factor with potential for enhancing the transformation to online learning is the growing recognition of the importance of international partnerships. The recent UNESCO declaration of a Global Education Coalition emphasizes the need to help countries in mobilizing resources and implementing innovative and context-appropriate solutions to provide education remotely by ensuring equitable solutions and universal access to all students. Following the announcement of this initiative on 26 March 2020, with the full commitment of the UN, many private and non-profit organizations (Microsoft, Google, Facebook, Zoom, Coursera. Khan Academy, Dubai Cares) immediately joined the Coalition. Bringing international partners together to address connectivity and content challenges, among others, ensures a coordinated response and avoids the wasteful overlapping of efforts. It also highlights the importance of permanently sustainable solutions and of the social responsibility of the partners (UNESCO, 2020e). The initiative is thus a significant example of a multi-stakeholder partnership to provide sustained, long-term, real solutions for online learning.

It is therefore possible to conclude that a growing awareness of the value of global initiatives and of the importance of putting greater emphasis on integrating technology as a vital part of the teaching and learning process provides a major opportunity for a transformation to online learning. These initiatives will enable all education stakeholders (decision-makers, teachers, students, and parents) in Palestine to balance the local with the global and will help to overcome limitations of scale and restricted attitudes by thinking globally while acting locally; and this will accelerate the transformation to sustainable online learning.

To summarise, the most significant findings of this study is the usefulness of using technologies in responding to the COVID-19 crisis in Palestine and other countries in terms of raising safety awareness, communication, and the design and delivery of educational materials. Furthermore, the results revealed many challenges facing decision-makers, teachers, students, and parents in providing online education for all students during the crisis in Palestine, related mainly to the educations' digital divide (accessibility and preparedness to develop quality interactive content) and the negative attitude towards online education in terms of misconceptions and poor planning. This research has also made a substantial contribution to the impact of COVID-19 crisis for reimagining education and accelerating positive change in teaching and learning through digital inclusion. The fundamental of transformation to sustainable online learning requires deeper connection to the needs of teachers and learners. Consequently, the study highlighted the essential resources to create an enabling environment including declaring a clear strategy and policy, raising awareness, delivering training, and improving the infrastructure.

Conclusion and Suggestions

The school closures due to the first wave of COVID-19 in early 2020 required specific consideration by all educational actors to achieve flexible learning approaches for all students through technology-enhanced learning. Therefore, the importance of using technology during the outbreak in Palestine has been discussed from the perspectives of decision-makers, teachers, and parents. All participants have signified that technologies such as mobile devices, social media and cloud computing are available to the Palestinian and would be useful and appropriate for raising safety awareness, communication, and the design and delivery of educational materials. However, given the uncertain and disruptive nature of the conditions in which online education has been planned, designed, and implemented, it would be misleading to conclude that it has provided effective learning opportunities for all school-age children. The main challenges of implementing online education as a response to the coronavirus crisis in Palestine are the widening of the education' digital divide and an increasingly negative attitude towards online education. Nevertheless, this documentation of the COVID-19 wave one highlights future opportunities as well as challenges for decision-makers, who can be expected to

introduce further changes as they rethink the usefulness of integrating technology into education reform, not only for future waves of the pandemic, but also in the long term and on a large scale.

Hence, this suggests the need for policymakers at the MoE to have a clear vision of the concept of technology-enhanced learning that is appropriate for the Palestinian context for rapid development of online learning strategic plan. First, it is necessary to raise awareness among all stakeholders to facilitate wider adoption of online learning and building bridges of communication among stakeholders via social media. Likewise, MoE should consider the importance of building a network of public-private partnerships. Therefore, a great need to launch national coalition and strengthen shared commitment and social responsibility as all partners work together to narrow the education's digital divide. Additionally, the need to invest in upgrading the infrastructure, with a focus on the most marginalized students. Lastly, it would also be essential to investigate teachers' needs.

A key limitation to this study was gaining access to educational stakeholders during a very difficult time when they were immediately within the emergency situation. While a great deal can be gained from qualitative interviews with 20 participants, the findings would have been more robust with more participants. Furthermore, in-person interviews may have been more personable, and the participants may have shared further insights into their experiences. At the time of the interviews and up to this point in time, Covid-19 is still prevalent and in person interviews are not appropriate or allowed by the Palestinian government. These interviews provide data from the onset of Covid-19 school closure, which is a unique opportunity to learn about the perceptions of those navigating Covid-19 emergency teaching and learning. Going forward, it may also be interesting to compare data from interviews of those providing retrospective perceptions on those early days, as well as education in Palestine after months into the pandemic and post-pandemic. Future researchers may be prudent in using this data as a springboard for developing plans for future pandemics and other emergency situations. Also, did the necessary use of online learning change perceptions on the efficacy of the online tools and pedagogies.

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