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Educators' Perceptions of the Influence of Culture on Social Media Use in Education in Palestine

Rami Muhtaseb, John Traxler, Howard Scott

Abstract: The advance in employing digital technology in education is often accompanied by a dominance of Anglophone digital corporations and tools, and a dominance of Western models of education, resources, practices, and concepts. This influences many aspects of teaching and learning and causes ongoing threat to societies, cultures and communities outside the global and national mainstream, especially those that are small, marginal or fragile in terms of the preservation and enhancement of their own culture and institutions. This paper addresses these threats within the Palestinian context by reporting on a study that explored educators' perceptions of the influence of culture on social media use in education. The conceptual framework that guided this study includes theories of Connectivism such as Siemens' and theories of cultural dimensions such as Hofstede's'. The study used semi-structured interviews with 18 educators at three Palestinian educational institutions who apply different teaching modes. The findings reveal nine cultural aspects that influence educators' perceptions of social media and its use for educational purposes. They also demonstrate the influence of culture on some Connectivist practices in the Palestinian context. Other factors, such as the Israeli occupation were found to affect educators' practices and perceptions. The study reveals cultural aspects that are not included in Hofstede's Cultural Dimensions theory, and this serves to underline that Hofstede's cultural dimensions only provides a partial or incomplete understanding of how culture influences educational technology use in the Palestinian context. The study provides a foundation for future thinking about decolonizing research methods, developing modern pedagogies and appropriating some global concepts within the Arab context.

Keywords: Arab Culture, Connectivism, Digital Learning, Informal Learning, Social Media

Highlights

What is already known about this topic:

- Social media offers various tools and resources that can support formal and informal learning.
- Local culture impacts educators' and learners' use and acceptance of emerging technologies, but our understanding of this is currently not systematic or objective nor applied.

What this paper contributes:

- Educators identify a set of cultural factors affecting Palestinian educators' use and selection of social media tools and resources.
- The Connectivist Cultural Synthesis of the two theories - Connectivism and Hofstede's cultural dimensions - within the Palestinian education context.

Implications for theory, practice and/or policy:

- More efforts are needed to promote culturally responsive integration of digital technology in education.
- The study highlights the necessity to examine western theories before being applied in the Palestinian context.



Introduction

Fast-growing advances in digital technologies have increased the opportunity of investing in these technologies in education. Educators and learners have used diverse tools to form learning communities where they can connect, interact, and share content and resources. This advance is often accompanied by a dominance of Anglophone digital corporations and tools, as well as a dominance of Western models of education, resources, practices, and conceptions. Additionally, this has an impact on many aspects of teaching and learning and poses a persistent threat to societies, cultures and communities that are not part of the global mainstream, particularly those that are small, marginal or vulnerable in terms of the preservation and development of their own culture and institutions. Mawasi et al. (2020) observe: "What we see as a "new" digital divide, however, are the disparities between the increasing use of technologies to automate, control, and surveil students of historically marginalized communities, in contrast to more creative, humanizing, and interest-based applications of digital technologies in more affluent communities" (p. 2).

Many studies criticize the hegemony of Westernized constructions of online learning (e.g., Spring 2008; Goodfellow & Lamy, 2009; McDermott, 2017; Traxler, 2018; Creely, 2022). Goodfellow and Lamy (2009) argue that applying Western/Anglo educational pedagogical philosophy to online learning in multicultural contexts should not go unquestioned. They highlight the importance of critically exploring 'What kinds of knowledge are being promoted? And how?' and conversely, 'what kinds of knowledge are being neglected or obscured?'. In addition, several studies suggest that it is necessary to critically examine the cultural appropriateness of any technology used in education (Sanchez et al., 1998; Joy et al., 2009; Yoon, 2015; Huang et al., 2019; Dong & Mertala, 2021; Bhatnagar & Many, 2022).

The Palestinian Context

Palestine has unique political circumstances, Palestinians live in divided areas, mainly; East Jerusalem, Palestine 48 areas¹, the West Bank², the Gaza Strip, refugee camps in Palestine, and camps in Jordan, Syria, Lebanon. The refugee status has different and slightly conflicting definitions in the neighbouring countries, and each area has its own specialties and challenges.

The education of Palestinians is confronted by many challenges including lack of support, lack of sufficient infrastructure (especially for scientific laboratories and equipment), and lack of informal science learning venues³, such as science museums and science centres (Wahbeh, 2006; Darwish, 2009; Robinson, 2010; Wahbeh, 2015; Abualrob, 2019). According to Ramahi (2015), students in Palestinian schools, colleges and universities are taught to become passive recipients of pre-packaged knowledge, she related that to an outdated pedagogy that is associated with power structures and patriarchal elites.

The Israeli occupation and its associated practices and policies have undermined the Palestinians' capacity to fulfil the right to education (Palestine Human Development Report, 2015). It has an immediate impact on many aspects of Palestinian life, and it is most obviously evidenced in the Palestinian educational process, including a high level of physical control, restrictions on movement and privacy, abuses of digital rights, a lack of freedom of expression and censorship and association (Taha, 2020). The United Nations Development Programme (UNDP) reported that "the education system is in disrepair and failing, due largely to effects of the Israeli occupation: insufficient school infrastructure, lack of adequately trained teachers, separation between Palestinian areas, and a lack of access to schooling in marginalized areas" (The 2014 Palestine Human Development Report, 2015, p. 63).

¹ Palestinians 48, also called Arab 48, are the Palestinians that have remained within Israel's 1948 borders when the Israeli state was founded.

² The Westbank is divided into three zones (called Area A, B, C), only one, that around the city of Ramallah, has some slight autonomy.

³ Towards an Interactive Science Centre in Palestine, Master Plan, A.M. Qattan Foundation

In a study that explores the impact of the occupation on the professional lives of Palestinian teachers around the city of Nablus, teachers describe the daily suffering of children who suffered trauma due to the invasions of houses, arrests or the death of a relative (Traxler et al., 2019). Saffarini (2010) describes how the Israeli military has strongly interfered in the Palestinian higher educational process since the year 2000 by imposing frequent prolonged curfews, military roadblocks and checkpoints, frequent closure of cities which prevent thousands of students and professors from reaching their universities.

A report by *The Arab Center for the Advancement of Social Media* refer to the Israeli control over critical aspects of the ICT sector that make it impossible for Palestinians to develop an independent network and thereby enjoy a greater safety and flow of information. This control of the Palestinian ICT infrastructure and mobile networks has also allowed Israel to subject Palestinians to mass surveillance, and restrict their access to digital rights, specifically rights to internet security, privacy and freedom of opinion and expression (AbuShanab, 2018; Itmazi & Khlaif, 2022), and more recently, to increase its monitoring and censorship of Palestinian content online. The aforementioned challenges highlight the need for more efforts to understand the specialities, needs, and challenges that confront the Palestinian education sector, and to critically explore the possibilities and threats of current and emerging technologies.

This article reports on the findings of a study that explores the influence of culture on the use social media tools and resources in formal and informal learning in Palestine. The study used personal interviews with 18 educators at three Palestinian educational institutions who apply different teaching modes, specifically informal community learning, formal campus learning and formal blended learning. The research participants are educators who work in formal and informal science education in the Palestinian city of Ramallah. In this study, semi-structured interviews are conducted with open-ended questions, enabling participants to talk about their experiences, perceptions and concerns. Data are analysed using inductive coding methods that identify, analyse and compare open codes before grouping them into categories.

Literature

In the last few years, a significant number of studies have focused on the use of social media in formal learning settings. Many studies focus on student and faculty perceptions of social media use in formal and informal learning in higher education (Diamond, 2017; Evans, 2017; Stathopoulou et al., 2019; Aburagaga et al., 2020; Ashour, 2020; Mpungose, 2020; Lacka et al., 2021; Lambton-Howard, 2021), and specifically address their perceived affordances, limitations and concerns about social media use in a higher education context (Won, 2015; Diamond, 2017; O'Keeffe, 2016; Evans, 2017; Latif et al., 2019). Some studies focus on challenges experienced when social media tools are used (O'Keeffe, 2016; Evans, 2017), and on tools that students and faculty use for various educational purposes, both inside and outside educational settings (Coetzee, 2014; Aburagaga et al., 2020; Ashour, 2020; Erhel et al., 2022); others, meanwhile, focus on a specific tool as a case study (Won, 2015; O'Keeffe, 2016; Evans, 2017; Frohock et al., 2022).

The majority of the reviewed studies from Arab countries support the claim that social media may improve teaching and learning by facilitating various aspects of learning, both inside and outside the classroom (Kutbi, 2015; Abdulkareem, 2015; Alsolamy, 2017; Alghizzawi et al., 2019; Sharma, 2019). Some research suggest that students do not effectively use available tools and resources (Alsurehi and Youbi, 2014; Abdulkareem, 2015), and others identify challenges that confront students and faculty (Alsurehi & Youbi, 2014; Kutbi, 2015; Alsolamy, 2017; Alenezi & Brinthaupt, 2022).

Cultural Differences and Learning

Learners are exposed to a variety of learning technology and resources in the modern global learning environment, but the ways in which they are applied to teaching and learning may differ from one culture to another. Numerous studies stress the significance of studying the connection between cultural background and the ways in which people chose to learn; in addition, they note how cultural values are embodied in adopted technologies and invite to critically assess if these tools have been adjusted to suit learners' cultural backgrounds (Sanchez et al., 1998; Joy & Kolb, 2009; Yoon, 2015; McDermott, 2017). Richardson (2004) suggests many problems can occur when western educational concepts and innovations are uncritically transferred to foreign countries and cultures. Hofstede (1997) describes culture and its traditions as learned thinking habits and stresses how differences in cultural socialization influences learning preferences and styles (such as preference for abstract conceptualization over concrete experience, or preference for active experimentation over reflective observation) (Joy & Kolb, 2009, p. 3).

According to Rasiah (2014), educators who intend to use new technologies or tools should be aware of their students' social backgrounds. They should also incorporate this knowledge into their overall pedagogical techniques and assessment methods, as this will help to achieve a substantive student engagement in the learning process. Minnis (1999) recommends the use of curricula and teaching methods that take into account students' culture and behaviour patterns, both at home and in schools (cited in Richardson, 2004, p. 431). According to Richardson (2004), many problems can occur when western educational concepts and innovations are uncritically transferred to foreign countries and cultures.

Several models contributed to understandings of national culture that incorporates its different dimensions (e.g., Dorfman & House, 2004; Trompenaars, 1993; Trompenaars & Hampden-Turner, 1998; Bjørn, 1999). The social psychologist Geert Hofstede's Cultural Dimensions Theory (1980) is one of the most notable international models that describes the impact of culture on the values and behaviour of members. It situates national cultures along six dimensions, specifically power distance, individualism vs. collectivism, uncertainty avoidance, masculinity vs. femininity, long-term orientation vs. short-term orientation, and indulgence vs. restraint (Hofstede & Bond, 1988; Hofstede, et al, 2008).

Table 1. Hofstede's Cultural Dimensions Model

Cultural Dimension	Definition
Power Distance	Power distance refers to how different societies handle human inequality differently. Inequality can occur in areas such as prestige, wealth and power. Connotations are shown of power distance differences for various institutions: in the family, for schools and educational systems, in work and organization, in political systems, and in religion and ideas (Hofstede, 2001, p. 79).
Individualism Versus Collectivism	Individualism-Collectivism describes the relationship between the individual and the collective in a given society. It is reflected in the way people live together- for example, the selection of nuclear families, extended families or tribes has many implications for values and behaviours. In some cultures, individualism is seen as a blessing and a source of well-being while in others it is seen as alienating (Hofstede, 2001; p. 209).
Uncertainty Avoidance	Uncertainty avoidance refers to the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known (Hofstede, 2001, p. 145).
Masculinity Versus Femininity	Hofstede refers to masculinity and femininity and observes: "[T]he duality of the sexes is a fundamental fact with which different societies cope in different ways; this issue is what implications the biological differences between the sexes should have for the emotional and social roles of genders" (Hofstede, 2001, p. 279).

Long Term Orientation Versus Short Term Orientation	Both forms of orientation relate to the focus of people's efforts, which respectively address the future or present (Alabdullaziz, 2015).
Indulgence Versus Restraint	Indulgence relates to a society that allows relatively free gratification of basic and natural human drives, including enjoying life and having fun. And restraint is a society that suppresses the gratification of needs and subjects it to the regulation of strict social norms (Hofstede Centre, 2015).

Arab Culture and Digital Technology Use in Education

Arab culture has been classified by Hofstede's cultural dimensions model as having high power distance; collectivism; masculinity, and relationship orientation; high uncertainty avoidance (Najm, 2015). Some researchers describe Arab culture as homogenous and cite a common set of perceptions, values and attitudes as evidence (Ronen & Shenkar, 1985; Kwon & Kim, 2013; Najm, 2015). Al-Soufi (2005) however points to large cultural differences among Arabs. He suggests, the vast majority of European business schools and research centres teach cross-cultural perspectives by focusing on Western vs. Eastern cultural perspectives, and claims this creates the assumption that 'collectivist' Arab countries will behave like other 'Eastern' countries. According to Najm (2015), the existing models fall into the trap of standardization, and they contribute to the formation of stereotypes and prior classifications for ethnic groups and their cultures.

Some studies that relate to Arab culture also criticize the international models for neglecting some dimensions that are considered to be extremely important in Arab culture (Weaver, 1997; Najm, 2015). For example, Najm (2015) observes that Arab culture has been influenced by the religious (or faith) dimension and family and tribal relationships. Weaver observes that the religious dimension is an important cultural value in the Arab world, although he adds that the importance differs across separate Arab countries (Weaver, 1997; Najm, 2015). Hofstede model has also been criticized for its tendency to equate culture to nationality (Williamson, 2002; Kingston & Forland, 2008; Signorini et al., 2009, Sent et al., 2022).

A few studies explore the influence of Arab culture on technology use in teaching and learning (Al-Harathi, 2005; Uzuner, 2009; Richardson, 2014; Benaida, 2018; Milla & Dos-Santos, 2019; Al Lily et al., 2020; Al Lily & Alhazmi, 2022). One qualitative study focuses on the learning experiences of six Arab graduate students in the United States and incorporates Hofstede's cultural dimensions and Hall's (1976) distinction between 'high' and 'low' cultures into a theoretical framework (Al-Harathi, 2005). It finds that students expressed anxiety about taking online courses, as they equated online learning with independent learning, which appeared to be attributable to the high uncertainty avoidance in Arab culture (Al-Harathi, 2005; Uzuner, 2009). Richardson's (2014) investigation of the impact of Arab trainee teachers' lifestyle and experiences on engagement concluded that the trainees' lifestyle and experiences, as well as the Arab-Islamic codes of behaviour, affected the trainees' engagement in their own learning processes, including interactions between men and women and superior and subordinate in educational settings.

Haj-Muhammad (2013) and Al-Amleh (2014) draw on Hofstede's cultural dimension to discuss culture in Palestine and its influence on teaching and learning. The table below shows how culture in Palestine is described according to the six dimensions.

Table 2. Culture in Palestine According to Hofstede's Cultural Dimensions Model

Cultural Dimension	Culture in Palestine
Power Distance	High power distance culture (Al-Amleh, 2014; Haj-Muhammad, 2013)
Individualism Versus Collectivism	Collectivist Society encourages and supports group work and fights against individualism (Al-Amleh, 2014; Mushtaha & De Troyer, 2007)
Masculinity Versus Femininity	Arab societies are invariably described as masculine (Haj-Muhammad, 2013)
Uncertainty Avoidance	High uncertainty avoidance culture (Al-Amleh, 2014; Haj-Muhammad, 2013)
Long Term Orientation Versus Short Term Orientation	Short-term orientation (Haj-Muhammad, 2013; Al-Amleh, 2014).
Indulgence Versus Restraint	Conservative society, social traditions encourage restraint, and this is influenced by religion (Lee et al., 2020)

Many of the aforementioned characteristics can be reflected in educational thought and the educational system in Palestine (Haj-Muhammad, 2013); curricula generally entrench these characteristics, in both intellectual or scientific terms, in content that does not engage a substantial number of modern controversial issues; school subjects cultivate extensive passive memorization, and the education system focuses on teaching ideas in the absence of discussion and critical analysis and without developing problem-solving skills (this is, it should be noted, consistent with the prevailing culture in the wider society – see the Palestine Human Development Report, 2015), which turns students into passive recipients of knowledge and rules (Haj-Muhammad, 2013).

The review of the literature shows that educators have insufficiently investigated the use of social media in higher education and informal community learning in the Palestinian context (Muhtaseb, 2022). Only a few studies in the literature that address how digital technology is used in education in Palestine (Shraim, 2010; Shraim & Khlaif, 2010; Rabaya'h, 2013; Shraim & Crompton, 2015; Traxler, 2018; Traxler et al., 2019). Among the existing literature, only a few studies that consider the influence of Arab culture on the use of technology in education in Palestine (Traxler, 2018; Rabaya'h, 2013). In addition, all analytical methods are western importations rather than native Palestinian (Muhtaseb, 2022).

Theoretical Background

The conceptual framework that guided this study includes the theory of Connectivism and Hofstede's Cultural Dimensions theory. Connectivism is a learning theory which seeks to explain complex learning in the digital world and emphasizes the importance of non-human appliances, hardware, network connections and software for human learning (Courros, 2009). According to Downes (2022), knowledge is constituted of the sets of connections between entities, and learning is the growth, development, modification or strengthening of those connections. As a learning theory for the digital age, Connectivism has the potential to improve social media-related learning activities, as it recognizes the teaching and learning opportunities that social media creates in formal and informal learning environments. According to Downes (2008), social media map to Connectivism since the theory proposes that knowledge is distributed across networks of hubs and learning involves negotiating such networks as social media to locate desired knowledge.

Siemens (2005) suggests Connectivism is characterized by eight principles:

1. Learning and knowledge rest on a diversity of opinions.
2. Learning is a process of connecting specialized nodes or information sources.
3. Learning may reside in non-human appliances.
4. Capacity to know is more crucial than what is currently known.
5. In order to facilitate continual learning, it is necessary to nurture and maintain connections.
6. The ability to see connections between concepts, ideas and fields is a core skill.
7. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
8. Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information are viewed through the lens of a shifting reality. While there is a right answer now, alterations in the information climate that affect the decision may mean it is wrong tomorrow.

In exploring the utilization of social media in teaching and learning in Palestine, the current study examines the applicability of Connectivism - a learning theory proposed in a western context - to the Palestinian social and cultural context. The study also explore how culture influences the formal and informal learning practice of educators in Palestine and to some extent other Arab countries⁴. Hofstede's model describes national cultures by referring to six dimensions, specifically power distance, individualism, uncertainty avoidance, masculinity, long-term orientation, and indulgence vs restraint (Hofstede, et al, 2008). Many studies draw on Hofstede's cultural dimensions to discuss culture in Palestine (e.g., Haj-Muhammad, 2013; Al-Amleh, 2014; Jaber, 2015; Rabayah, 2019), the adoption of Hofstede's theory, therefore, contributes to a deeper understanding of the impact of Palestinian culture on the application of Connectivism in higher education and community learning institutions. In addition, one of the study's objectives is to examine how the convergence of the theory of Connectivism and Hofstede's cultural dimensions can provide an appropriate theoretical account of the research context.

Methodology

This study adopts a multiple case study design to explore the use of social media in formal and informal science learning in Palestine. Baxter and Jack (2008) acknowledge that evidence collected from multiple case studies is robust and reliable, and note this enables the researcher to analyse within and across settings. The detailed procedures and the description of the three institutions and research participants are described in detail in a separate study (Muhtaseb, 2022).

Research Design

This study adopts a multiple case study approach to explore how social media are used in formal and informal science learning in Palestine. This is particularly important because most research studies done so far on the use of social media in science education have only looked at a single learning mode. This study includes three Palestinian educational institutions that apply different learning modes (formal campus, blended and informal community learning). Yin (2003) and Baxter and Jack (2008) observe that multiple case study designs are more robust because they provide richer evidence from multiple sources.

The study identifies and selects three educational institutions that apply different teaching modes (face-to-face | in-class teacher-led, blended | out-of-class teacher-led, and informal community learning | no class and no teacher) and approach (activities, workshops, and courses). The three case studies are selected on the basis of their teaching mode with the aim of achieving a better understanding of the factors influencing the use of social media in education. Institutions that offer different modes of learning have different institutional policies, and these policies may have an impact on how educators utilize the

⁴ Palestinian culture is part of Arab culture.

available tools or opportunities. In addition, the nature of learning at each institution suggests various forms of using social media tools and resources, for instance, social media can be used as a research tool, dissemination tool, collaboration tool, and data collection and sharing tool.

There are also similarities and differences between the modes of teaching and learning, and educators have different interests and motivations. To take one example, formal campus learning educators are constrained by formal learning regulations (assessment, attendance and curricula) that could affect their selection of tools and resources. But educators at informal community learning institutions have more diverse learners and fewer restrictions. Informal learning institutions also focus on different aspects of science education, such as the promotion of science literacy, science communication, and public engagement.

Six educators from each institution are interviewed. The three case studies locate (or have a major branch) in the city of Ramallah, which is a central city in Palestine. The lead author is Palestinian who resides in East Jerusalem and works in a Ramallah-based informal learning institution. Ramallah is located in the West Bank, where the Palestinian Authority control most affairs, however, major issues and challenges confront Ramallah and other Palestinian cities, such as travel restrictions, lack of resources, lack of science equipment, lack of informal science venues, and political issues connected to Israeli control.

Data Collecting Tools

This study explores how educators perceive the integration of social media into different teaching modes, and this renders personal interviews as the most appropriate tool. In this study, 18 semi-structured interviews are conducted with open-ended questions, enabling participants to talk about their experiences, perceptions and concerns. The research objectives and the literature review establish a basis for the development of the interview questions. The interviews explored educators' perceptions of social media tools and the factors that affect their use of available tools and resources. This included a closer investigation of the cultural aspects that influence the use of social media in teaching and learning.

Participants

The research participants are educators who work in formal and informal science education in Palestine the first institution offers undergraduate degrees only in face-to-face mode while the second institution offers undergraduate degrees in distance/blended learning modes, and students can choose to study on campus, or study as distance, or they can choose to study the blend of two, therefore, the university offers live sessions, recorded sessions, and there is a self-study curriculum. The third institution mainly provides workshops and professional development tracks for teachers and informal community-oriented activities (e.g., exhibitions and festivals). It has diverse learners (students, youth, families, teachers and the general public) and imposes fewer restrictions on the selection of online tools than formal learning institutions.

In this study, the diversity of educators backgrounds, age and gender are considered. It is also important to ensure that the sample is truly representative of the entire target population – namely, the three institutions (or selected branches) located in the Palestinian city of Ramallah. Table 3 shows the demographic information of participants. We seek to give both genders the same opportunity to provide their perceptions and attitudes, and also consider if gender could influence the attitudes of educators.

Table 3: Demographic Information of Participants

Gender	Number of educators
o Male	9
o Female	9
Age	Number of educators
o Up to 30 years	1
o 30-39 years	3
o 40-49 years	7
o 50-60 years	4
o Over 60 years	3
Teaching experience	Number of educators
o 1-5 years	2
o 6-10 years	5
o 11-15 years	3
o 16-20 years	2
o More than 20 years	6

Data Analysis

According to Cresswell (2007), qualitative researchers employ qualitative approaches when that data is sensitive to the people and places being studied and that data analysis tends to be inductive and orientated towards establishing patterns or themes. With inductive coding, a researcher reads and interprets raw textual data to develop concepts, themes or a process model (that draws on data-based interpretations) (Corbin & Strauss, 1990; Boyatzis 1998; Thomas 2006; Chandra & Shang, 2019). Data are analysed using inductive coding methods that identify, analyse and compare open codes before grouping them into categories. The data analysis is conducted in three phases, and this makes it possible to identify and define common themes that will contribute to a better and deeper understanding of participant perspectives.

General observations and impressions

The first phase includes listening to the recordings, reading the transcripts and documenting observations and impressions. Before starting the qualitative analysis, we have to decide whether to code the Arabic or English transcripts. We eventually decide to translate the whole transcripts into English, as most of the literature on the research topic is written in English. In order to ensure the reliability of the findings, we try to code one page of the transcript in the two languages; after comparing the resulting codes from the two transcripts, we did not see an observable difference. Once the transcripts are translated into English, we disconnect for two weeks to read through the English transcripts several times while documenting general observations and impressions. In this period, we also read the transcripts from each institution separately to ensure that we accurately captured the respondent comments. Some observations are generic, while others are institution specific.

The first treatment of data

This phase begins with open coding and the documenting of reflective memos. Yin (2014) suggests the memo writing begins during fieldwork and continues into the analysis stage. Memos can contain hints, clues, and suggestions that expose any part of the data to preliminary interpretation. In open coding, data are segmented into meaningful expressions that describe them in a single word; a short sequence of words is known as 'codes' (Flick, 2014). After generating initial codes, we establish categories and then compare them: this makes it possible to organize and group some subcategories under main categories, then into major themes. We use Microsoft Word documents for the analysis and add codes, categories and interpretations as comments. Table 4 shows a sample organisation of the codes into categories and subsequent themes.

Table 4. Illustrating the Process of Moving from Transcripts to Themes

Quotes	Code	Category	Main Theme
"Some videos and ads may not be appropriate to our culture, so we need to use these tools appropriately".	Ads may be inappropriate to culture	Conservative culture	Cultural aspects influencing Social Media use
"Some conservative communities refuse the idea of having internet at home, they perceive it as outsider that may uncover home's privacy"	Conservative communities have privacy concerns	Conservative culture	
"To reflect that on education, every student has the right to express. But in my opinion, there is some kind of fear of the consequences of clear, honest, and explicit expression, and this is part of our culture"	Worries about freedom of expression	Freedom of expression	
"The ability to explain the science concepts and process is amazing, for example, when you use videos for teaching Biology courses, you can go through the digestive system, some videos show you the blood track, it is like you are traveling through the arteries, or see the Amoeba through microscopic animation."	Utilizing videos to explain science	Videos & Visualization tools	Social media use in science education
"Students can't easily imagine how to transform rectangle into cylinder. I post resources for them that includes videos or animations which help students who may have difficulties with imagination. I also share with them videos about anything I find difficult in each unit"	Teacher utilizes animation and videos to explain math	Videos & Visualization tools	
"I think social media is indispensable to keep me well-acquainted with science updates in my specialization. It helps me stay connected with my friend and colleagues"	Staying well-acquainted with science using social media	Access to science resources & to the scientific community	

The second treatment of data

After two weeks, a second treatment resumed, where codes and categories are generated. After the second coding, we compare the resulting categories, which enables us to group some categories into major categories and identify key themes. In this phase, we conduct a detailed analysis of significant themes that have the strongest connections to the study and make sure that themes are not excluded. For instance, when investigating respondents' concerns, we address educators' concerns and limitations as the central phenomenon and collect all pertinent codes and memos.

The analysis process continues until a saturation point was reached where no further coders or categories emerge from the data analysis and no further analysis is required. The saturation point according to Corbin and Strauss (2008) is "the point when all the concepts are well defined and explained", and no new data emerges. They reported that saturation denotes the development of categories in terms of their properties and dimensions.

Research Validity

Certain procedures are taken to ensure the validity of the interviews, such as asking two research colleagues to check the design of the interview protocol and questions to make sure that the data collection method appropriately addresses the research questions. The interview protocol is then piloted with three educators from the three institutions before actual implementation begins. One of the goals of the pilot study is to assess the cultural appropriateness of the interview questions. The analysis of the pilot interviews and in-depth discussions of the results comes next. We wait for two weeks before repeating the analysis process. The pilot interviews provide us the opportunity to enhance the interview

procedure (including the identification of potential obstacles) and we make some adjustments on this basis.

Several ethical issues have been carefully considered to ensure that the highest possible ethical standards are met, including confidentiality, informed consent, anonymity, integrity, data storage and the accurate and impartial representation of participant contributions in the results (See Muhtaseb, 2022). We explained our research objectives at the outset of interviews and gave participants time to read the working definitions and read and sign the informed consent form. After the interviews, we email an interview transcript to each participant and ask them to review, and then validate or refute the transcript in order to ensure the credibility of the research findings. The interviews are conducted in Arabic, and the transcripts of the interviews are translated into English. We then ask two colleagues who are proficient in both languages to confirm their accuracy while maintaining the confidentiality and anonymity of participants.

Presentation of the Findings

A total of four themes emerged during data analysis, specifically; educator perceptions of social media affordances; the use of social media in science education in Palestine; educator concerns and limitations; and cultural aspects that influence the use of social media in science education in Palestine. This article discusses the fourth them in detail, other themes that emerged from the thesis where the study was situated are explored in a separate paper.

1- Educator's Perceived Affordances of Social Media Use for Educational Purposes

The vast majority of the educators who took part in this study have a positive impression about integrating social media in formal and informal science education. Respondents most frequently cite communication, collaboration, and content sharing as their purposes for using social media. The data analysis reveals that affordances can be categorized under three major categories, specifically promoting teaching and learning, supporting educators and empowering students.

Promoting Teaching and Learning Through Social Media

Participants in this study reported that social media tools help to promote teaching and learning. Nearly two-thirds (66 percent) of respondents value the richness and diversity of resources made available through social media and discuss how it support teaching and learning, expands student research options, fosters self-learning opportunities and creates possible access to alternative resources and tools. Some educational activities described by educators make extensive use of available tools and resources, including watching videos at the beginning of lectures to initiate discussion, discussing some course-related topics through Facebook or WhatsApp groups, researching related activities (such as data collection), sharing news and resources, sharing visual content as part of the course content, and enrolling in external courses (via MOOCs or Youtube). Participants from both formal and informal institutions describe how learning is becoming more personalized, meaning that students can learn anytime and anywhere and in ways that correspond to their capabilities.

Respondents use social media to enhance classroom practices; this includes initiating discussions; sharing visual content as part of the course content; supporting collaboration and data sharing amongst workgroups; and preparing lessons and workshops. Respondents from the campus and blended learning institutions describe a change in lecture delivery. Respondent F15, for instance, refers to a change in lesson delivery; "Sometimes I use videos as an inverse classroom, I ask students to watch it before the lecture, and to come to the class to turn the class into [a] discussion panel about the video." Some educators have observed that social media provides opportunities to collaborate with other institutions and make academic contributions that are unrelated to their institutions.

Empowering Students Through Social Media

Participants discuss projects that show how the level of interaction between educators and learners improves with the use of social media: such as communicating with learners after work, and posting science-related content. Some educators mention interacting with students from the Arab world on their course-related Facebook pages, and some pages continue to be active after the semester ends. Various respondents (F9 and F14; M7, M10 and M17) identify how they have previously used social media tools and resources to empower students in various ways and give them an active role in the learning process. Respondent M7 observes: “Students are no more passive recipients of information, maybe this is the worst learning method, but if you offer students different resources such as teacher, Wikipedia, YouTube, or whatever, and allow them to look for information and to connect these things, they construct their own knowledge.”

Various respondents (M10, M11 and M17) suggest that social media can help to eliminate some communication barriers, such as those related to official language, authority, hierarchy and official platforms. Some educators use social media tools to provide academic support to their students, and this was more significant in blended learning due to the nature of learning activities at this institution. Educator M10 values the ability to send instant feedback to students, and explains; “Previously, you needed days to see that, but now educators can take a photo with their mobile and share to the group instantaneously, and you can comment while the event is taking place, you are with them in the scene.” Several examples demonstrate how educators move to informal platforms and follow students and select platforms which students are active on.

Empowering Educators Through Social Media

Some participants describe the value of social media in supporting teaching, and point out how it increases both their opportunities for academic and professional development and their own influence. Examples include connecting with the academic community, and using blogs and academic social networks to document science experiments.

Many educators use various social media platforms and resources for academic, personal and professional purposes. For instance, Respondent F13 explains how social media keeps her well-acquainted with her students and also makes it possible to recommend content to them. She observes: “I use social media and mobile applications highly in my daily life, some of these tools are linked to my work, and some tools are linked to my personal development”. She also observes: “I use ResearchGate to find scientific papers or to get some references, I also use LinkedIn highly, it is a tool to build academic and professional record, it includes jobs opportunities, I update it regularly with new courses I attend, like that course from Stanford which I attended via the MOOCs”. Respondents F12 and F15 observe how social media enables educators to exert more influence in society. Respondent F15 observes: “The educator can use such pages to talk about his/her courses or to have an influence in society, I have my personal page, and I think I have a lot of diverse followers, and they interact through it, so, this is a medium that is available for everyone, and they can utilize it their own way”.

2- Social Media Use in Science Education in Palestine

Closer analysis of participant answers shows that the use of social media in science education can be placed in four main categories, specifically fostering student understanding; improving teaching efficiency; research tools & resources; and science communication.

Fostering student understanding

The educators who participate in this study place a clear value on the potential of social media to improve many aspects of formal and informal science education in Palestine. Several educators discuss the use of diverse tools and resources to explain science-related concepts and phenomena. Some examples

illustrate how educators employ various tools and resources to enhance student understanding, including the sharing of animations and illustrations and the use of interactive tools. 94 percent of respondents describe how videos and visualisation tools are used for educational purposes. Respondent M3 observes: “When you use videos for teaching Biology courses, you can visualise the digestive system, some videos show you the blood circulation, it is like you are travelling through the arteries”.

Improving teaching efficiency

Analysis of the findings reveals that educators place a clear value on the potential of social media to improve the efficiency of science education. This includes enhancing communication and data sharing and facilitating the documentation of experiments through blogs. Respondents (e.g., M2, M5 and F18) support practical work by posting lab experiments for students and using lab-related applications. Respondent (M2) observes that each lab has a session where a video is shown. Some educators use social media to initiate discussions; share visual content as part of the course content; and prepare lessons and workshops. And some educators connect workgroups in various geographic locations by using social networks and chat groups.

Research tools and resources

Interviewees described the role of social media in enabling (educator and student) access to a huge amount of science tools (e.g., online telescopes) and alternative resources (e.g., science videos and illustrations). Also, they frequently mentioned that social media offers educators various opportunities to connect with scientific communities and experts from across the world. Respondents explain how this helps them stay acquainted with science-related updates. Some respondents observe the available tools provide students with tools and resources and expand their research options. Respondent M11, when asked about social media opportunities for informal science learning, observes that social media has made knowledge accessible to everyone. He notes: “children can access information, see science experiments and apply these experiments at home”.

Communicating science through social media

Analysis of participant perceptions shows the potential to use social media for science communication, promoting science literacy and engaging in public outreach. Some educators use social media to interact with students outside the classroom, by publishing science-related activities on their personal accounts and sharing news about scholarships and opportunities with students after a semester or graduation. Respondents frequently mention the ‘added value’ of social media as a tool for science communication, which included employing science-related mobile applications for informal science activities and encouraging students to use the available tools for science learning purposes. Two educators (F4 and M7) encourage students to use the available social media tools to practise science communication. The former recalls “I encouraged students to create a group for astronomy in which they practise informal science education and communication”.

3- Educator Concerns and Limitations

Participants in this study shared several concerns and limitations, which relate to content, institution, student and educator.

Educator-related Concerns

The main educator concerns relate to privacy, work-life balance and coping with change. Six respondents from the three institutions mention privacy concerns, and Educator M17 emphasizes that it is a top priority (“with regards to the privacy issue, I give importance to the privacy of the family and the family’s news and my private information”). Respondents also mention actions that affect their sense

of privacy, including receiving messages after working hours, receiving a lot of messages after exams and communicating with colleagues outside working hours. Other educators refer to difficulties created by continual changes in available tools and platforms, and Respondents M2 and F16 claim they are overwhelmed by the number of available tools.

Institutional Limitations

Respondents list restrictions that include institutions not acknowledging online work hours as work time or not allowing staff to choose teaching or assessment methods. Educators M16 and M17, who are from the blended learning institution, note that they have to use the traditional assessment approach, which they believe prevents the initiation of new teaching modes and affecting the willingness of students to follow their recommendations. According to Respondents M3 and F14, formal learning institutions are concerned about student misuse of social media tools. Yet, none of the respondents noted any restrictions on the use of informal platforms for educational purposes by their institutions.

Educator Concerns about Available Content on Social Media

Respondents mention some concerns connected to available content on social media, such as unauthentic and unreliable resources. Some educators are worried about undesirable adverts, and express concern that some suggestions could be culturally inappropriate. They also draw attention to the possibility that distracting or irrelevant content may appear on some platforms.

Participants also disclosed a few issues connected to science content in Arabic. One of the most frequently voiced concerns by educators is the credibility and quality of available Arabic science content on social media. Respondent M17 notes: "I see that most people do not give a concern to the credibility of the content which they find online, I find this a very important issue". Other concerns relate to the lack of Arabic language science resources.

Student-related Concerns

Some educators express concerns about a lack of student engagement, and some educators attribute a lack of student interest to the material/s that teachers share or recommend. One educator attributes low levels of student engagement to the fact that students undervalue online content or view content that is not required in the exam as being unimportant. A few respondents (including M3 and M16) point to a lack of digital literacy and research skills as a cause of inappropriate student practices. Three respondents (M3, F8 and F18) recommend developing students' digital literacy, and argue this can help them use social media in a way that fosters effective learning.

4- Cultural Aspects Influencing Social Media Use in Teaching and Learning in Palestine

The findings reveal nine cultural aspects affecting educators' use and preference of social media tools and resources for educational purposes. This section refers to data analysis insights provided by Palestinian educators; while some factors may not be directly connected to culture in Palestine, culture can nonetheless be theorised as an indirect influence on some perceptions or attitudes.

Conservative Culture

Some educators respond to questions about cultural factors that influence the use of social media in teaching and learning in Palestine by citing the conservatism of Palestinian culture and also point to the fact that social pressure could influence the selection of social media tools by students or educators. Concerns about publishing topics that do not conform with aspects of the culture or society are another issue brought up by educators. Respondent F18 refers to adverts that are considered to be culturally inappropriate in Palestine, and other respondents (F9, F13 and M6) refer to student concerns about

publishing their photos on public platforms. Respondent F15 notes student concerns may be connected to their communities.

A few educators have privacy concerns, they mention actions that affect their sense of privacy, including receiving messages after daily work hours, and communicating with colleagues outside working hours. For example, Respondent F12 uses two Facebook accounts to separate work and social connections. Although privacy is frequently cited as a concern by teachers and students across the world, the particular conservatism of Palestinian culture may mean it is especially important in this particular context. Educator F9 notes that students' privacy concerns may be connected to social pressure. She observes that some of her students do not use their actual names and avoid publishing photos on Facebook but do the exact opposite on Instagram. She notes: "It is like they feel some kind of protection since Instagram is less popular than Facebook or it is less common in their communities, or maybe they see Instagram more respectful to their privacy, maybe the issue is influenced by the community that surrounds them."

Informal Culture

The data analysis reveals many issues that are connected to informal culture in Palestine. The use of informal language in communication with learners is one aspect repeatedly mentioned by many respondents. Some educators found advantages in using informal language in communication inside the institution, such as reducing hierarchy between directors and staff and between students and their teachers, some educators at the informal institution use informal language to engage the public audience and motivate them to take part in their activities. On the other hand, some educators at the formal institutions expressed concerns that students are increasingly using informal Arabic language (such as typing 'Arabic' words that incorporate English letters & numbers) when communicating with their teachers over Facebook, WhatsApp or other social networks. One Educator explains that students could lose their capacity to use Modern Standard Arabic.

Although the use of informal language on social media tools has made it easier for students to communicate with educators at any time, educators complain that students send them messages at inappropriate times. The two educators (M6 and M11) note that in Palestinian culture it is not appropriate to disregard a personal message that someone sends on an informal platform ("it's like someone is knocking your door"). As a result, they feel obliged to reply to the personal messages, which typically contain requests or questions, after work or during vacations. In seeking to address this, some educators create rules for communication with their students.

The analysis identifies differences in how staff from formal and informal institutions perceive social media. Some educators from the formal institutions prefer to communicate with students through the learning management system and other educators instead opt for informal social media platforms. Respondent M17 notes how social media removes the barriers of official platforms. But Respondents F4 and M5 express concern that students behave unprofessionally on social networks. The former refers to informal behaviour by students ("it may also relate to culture, or how people perceive social media tools, students may behave informally with the educator on Facebook, it is like their brain can't separate, or they are used to behave informally on social networks"). Some respondents from the informal learning institution point out that the institution seeks to reach the public audience and encourage public engagement in the foundation's activities. Additionally, two educators (M11 and F12) discuss how they use informal tools and language, which they view as being aligned with the existing culture, to promote audience engagement (including feedback) and participation in their activities.

Of the cultural aspects identified in this study, the informality of culture in Palestine (mentioned 16 times) and the conservatism of wider Palestinian society (mentioned 15 times) were the most frequently expressed. The two concerns are very closely related, as concerns about informality are clearly expressed within, and by implication influenced by, a wider (conservative) Palestinian culture.

Authority and hierarchy

Educators observe the affordances of social media include the breaking of boundaries of hierarchy and authority. They cite examples that suggest this is connected to culture in Palestine. Respondent F15 observes that students feel they have more authority when interacting on informal social media platforms but Respondent M17 adds this is resisted by some educators, who seek to maintain their authority on social media (“some Facebook groups keep control which requires admins permission to post or contribute to the page, they aim to allow only contributions that are relevant to the studied topic”). He adds there is a danger this authority could be misused by educators (“but here there is also a challenge that some admins can be biased about the content that is allowed to be published, such as avoiding posts that contain criticism, although allowing such open discussions can give each side an opportunity to defend their point of view”).

This can be explained by referring to Hofstede’s power distance dimension, which characterizes Arab culture as a high-power distance culture. Some studies refer to power-distance and to the impact that power distance culture has in a school where authority is transferred to the teacher or school principal (Mushtaha & De Troyer, 2007; Haj-Muhammad, 2013; Al-Amleh, 2014). Al-Harhi (2005) and Uzuner (2009) study cultural factors that influence student learning and engagement in asynchronous learning networks, and report communication difficulties with instructors that result from students’ fear of confronting authority figures.

Freedom of expression

Freedom of expression is included among cultural aspects that affect the use of social media in education. Some educators describe social media as a tool of expression, and others believe that students are concerned about freedom of expression when they interact on social media, and attribute this to culture. Respondent M10 values the freedom of expression on social media (“It is clear that these tools give you a platform to share your point of view, and sometimes it has an influence on the public opinion, it gives you the freedom that is not available on traditional publishing platforms that decide what to publish”). And Respondent M17 observes some students feel empowered when expressing their ideas on social media, he describes how the power dynamic between educators and students changes on informal platforms. These interactions can also be affected by the culture with a high power distance, which both students and educators inhabit (Khalifah, 2010). Alabdullaziz (2015) suggests that students from collectivist cultures do not feel comfortable expressing personal opinions.

Respondent F12 notes students have concerns about freedom of expression and suggests this is influenced by culture in Palestine. She observes:

To reflect that on education, every student has the right to express, but in my opinion, there is a fear of the consequences of clear, honest, and explicit expression, and this is part of our culture. Technology is an expression tool, and it can’t be stopped, but if we could utilize it in education with our children in the right way, it can be great.

Respondent F1 observes the local culture influences her freedom to publish some content on social media platforms. She observes: “Also, you start to have concerns regarding the topic you want to share because some people do not believe in these ideas, they may annoy you, or label you”.

Freedom of expression is also influenced by the political situation in Palestine (Abu Zayad, 2015; Taha, 2020). A study by Traxler et al. (2019) notes that in the Palestinian context, concerns about digital literacy include “the need to express digitally widespread trauma, loss and pain in circumstances where meeting or demonstrating may be prohibited or problematic”. Abu Zayad (2015) describes the challenges that confront Palestinians when they try to use social media as a tool for freedom of expression, which include the Israeli authorities citing social media when arresting Palestinian activists.

Sensitivity to making mistakes

The findings show that student behaviour and level of interaction with social media tools are affected by the student's sensitivity to making mistakes. Respondents describe related concerns, which include making mistakes in recorded sessions, being monitored on official platforms and issues that arise during interactions on the learning management system.

Sensitivity to making mistakes and the tendency to move to informal tools. Some examples imply that students and educators tend to behave informally or move to informal platforms with the intention of avoiding mistakes or accountability, and it appears that sensitivity is connected to the tendency towards informality. Educators attribute certain student behaviours to avoiding mistakes, and two respondents also indicate they move to less formal platforms when communicating with their colleagues. But Respondent M11 observes how he and his colleagues typically agree on work-related issues by communicating through a chat application; they then 'formalise' their discussion by exchanging emails. Respondent F15 (blended learning institution) relates students' preference to watch recorded sessions rather than attend live sessions to concerns about making mistakes. She observes:

Students depend more on the recording than any live virtual classroom because they feel that they don't have to answer teacher's questions or to follow-up with the teacher. [S]tudents have concerns about virtual classrooms because it is recorded, they fear that their mistakes will be recorded.

She also adds that students have concerns about being monitored on educational platforms. However, this issue requires further investigation that may highlight other reasons and provide insight into why Palestinian students and educators move to informal platforms. These contributions however engage from the educator's perspective, and this means there is still an ongoing need to engage with student contributions.

Sensitivity to making mistakes and student interaction. Analysis of the findings reveals that the level of student interaction is affected by their sensitivity to mistakes. According to the respondents, students could be inactive on both formal and informal platforms or only active on informal platforms. Respondent F15 makes the following observation: "Moodle is very formal, and since it is monitored by the academic and managerial bodies, students feel tensed, they hesitate to interact in virtual classrooms. In contrast, students feel authority and freedom to cancel their contributions on informal platforms". Respondents F9 and F15 also observe a difference in student behaviour across platforms, and the latter reports the use of language differs on formal and informal platforms.

Shyness

Analysis of educators' responses show that shyness is among the cultural aspects that influence student interaction on social media platforms. Respondent M6 (informal community learning) frequently mentions that some of his students are shy, and also observes how this affects some of their actions, including interactions on social media platforms ("One of the ways to mobilize them is to publish photos or videos of the projects they apply in classes, but some students feel shy to send their photos while applying some activities"). He reflects on how cultural boundaries affects student contributions on a course-related Facebook group, and observes: "Sometimes students contact me, and they spend time writing a few lines apologizing for taking my time before asking what they want. [It] is like students feel some kind of shy when contacting me or when try to comment or contribute to a programme that they are not affiliated to."

This is consistent with the emphasis that Uzuner (2009) places on the importance of modesty in Arab culture. She explains that students deliberately participated less in online discussions because they viewed eagerness to participate as "showing off or trying to appear smart". Richardson (2004) investigates how the lifestyles and experiences of Arab trainee teachers impact engagement, and she

concludes that they, in addition to Arab-Islamic codes of behaviour, affect trainees' engagement in their own learning processes, including interactions between men and women and superiors and subordinates in educational settings. But only a few codes are collected under this category. Further investigation is therefore needed to understand how student shyness impacts on their online interactions.

Tendency to socialization

Many respondents value the communicative possibilities that social media offers; meanwhile, some value the social aspect of learning and others value relevant social media affordances such as increased educator influence and the elimination of communication barriers. The findings also reveal a tendency for participants and students to socialize, which educators have openly acknowledged. Respondent F12 provides an account of her participation in two MOOC courses ("I tried one course that was without social environment or human intervention, it was so cold") and makes a point of contrasting this experience with the "great and rich experience" she had in another course, which included collaboration on tasks and projects and discussions with other groups. Respondent M7 also observes that students enjoy interacting on non-academic social networks ("they are interacting because it does not need a lot of effort and it seems that they enjoy the process") and adds "the educator can use such pages to talk about his courses or to have an influence in society, I have my personal page, and I think I have a lot of followers and they are diverse". Respondent M6 also uses social connections to support his students ("I try to make good social connections which can lead to achieving something").

In general, respondents place a particular value on the possibilities of interaction and the social aspect of learning through social media. This should be considered in relation to Rabaya'h's (2013) observation that interaction and networking are firmly rooted in students' Arabic culture. This would help to explain why students are very social and prefer collaborative and collective activities to individual alternatives. Here it should also be remembered that Palestine, like other Arab countries, is collectivist (Haj-Muhammad, 2013; Rabaya'h, 2013). Furthermore, Rabaya'h (2013) explicitly cites this as a factor, along with the political tradition of socialism, that should be taken into account when considering the willingness of Palestinian students to work together.

Sense of responsibility

Some educators' statements show a high sense of responsibility towards their students, as shown by staying connected to students outside work hours and making an effort to support and motivate them.

Respondent M6 observes:

Also, there is a social aspect, we have better relations on the social level, and they feel I'm close to them, they can reach me easily and communicate with me, but this adds extra load on the teacher. I have a sense of social responsibility towards my students; that's why I reply to their questions and queries continuously even after work hours.

This sense of responsibility is also demonstrated by some actions that educators take to assist or motivate their students. Respondent F13 states "I also try to put some social content to the page to motivate students and support them". The sense of responsibility that educators have towards their students also affects their selection of communication tools. Respondent (F15) observes, for instance, how she deliberately moves to informal platforms, such as Facebook, to motivate her students. Some respondents also repeatedly mention that students need support and motivation. This may be related to the Israeli occupation and its associated practices that have an impact on the Palestinian students' daily life.

The respondents also refer to additional actions as evidence of their sense of responsibility. Respondent (M6) tells his students they can call him any time during his eight-hour workday and can also contact

him at any time during the day on Facebook. Respondent (F15) tries to answer student questions publicly because it matters for her that all students can see her answer. She observes: "These tools have an advantage that other student groups can see my answers to the student who asked the question, I care about the other students who see the answer".

The previous section includes examples where the extent of the connection between educators and learners increase with the use of social media, the available tools has also increased educator influence. Although the two benefits overlap with the educators' sense of responsibility and their tendency to socialize, but it can be argued that extending educators' quantitative reach as opposed to transforming their relationship with their students can contribute to disempowering educators. For example, in high power distance cultures, some educators have an elevated position in relation to their students, in this case, the familiarity and access produced by social media might reduce the extent or the perception of that elevation. Some educators may not be satisfied that student can access alternative educators from other countries and cultures.

Avoiding the unfamiliar

Respondents F8 and M16 believe that students avoid what is unfamiliar to them, and claim that this limits their willingness to accept new learning tools or approaches. The former notes that students may refuse unfamiliar approaches to education ("our students are not interested in accepting something from outside") and maintains this may make them less inclined to accept any new technology or tool they are unfamiliar with. However, the latter refers to a different factor, and observes:

There are some barriers to using virtual lectures and the Moodle, for many reasons, it could be related to student's culture, it is somehow different, we notice the existence of a culture of indoctrination among students which create some reactions towards the use of these tools.

This is consistent with Sabbah (2010) who cites student resistance to changes in some educational methodologies as one of the obstacles to the implementation of e-learning at Al-Quds Open University. And also with Al-Amleh's (2014) suggestion that Palestinian culture is a "high uncertainty avoidance culture". But only two codes are collected under this category, which is not sufficient for an explanation. There is accordingly a need for further investigation that will contribute to an improved understanding of this aspect and its connection to local culture in Palestine.

Discussion

The analysis of participant answers shows that educators and learners have benefited from social media to overcome limitations and challenges facing science education in the Palestinian context, including lack of resources, lack of advanced science equipment, and difficulties in reaching the educational institutions (AbuShanab, 2018; Itmazi & Khlaif, 2022). For example, some educators from the two formal learning institutions (Al-Quds Open University and Birzeit University) claim that movement restrictions between Palestinian cities and the general sense of uncertainty created by the political situation in Palestine, increase the educator and student need for instant communication tools. In the words of one participant: "Student may not be able to attend classes because his/her town is closed or the university is closed, but now they have additional tools". The use of social media to reach a wider audience in Palestine, on the other hand, is highly valued by educators at the informal community learning institution. Based on the data collected through the interviews, it appears that educators appreciate the added value of social media as a tool for science communication. For example, participants describe using science-related mobile applications for informal science activities and encourage students to utilise the available tools for science. Such benefits could offer opportunities to reach Palestinians who do not have access to museums or could compensate the lack of informal science learning venues in Palestine (Wahbeh, 2015).

There are numerous examples of how educators use social media adopt new roles, such as recommending online resources to their students and providing them with online guidance. One respondent suggests: “The teacher is like a guide, not just to deliver information, this role has ended”. In addition, there are a number of examples that demonstrate the intersection between educators’ roles at formal and informal learning where it normally does not involve teacher or instructor, or their role shifts from the presenter of instruction or lectures to learning facilitator in support of informal learning activities. In acknowledging the role of social media in facilitating informal learning, Chen and Bryer (2012) suggest that it can be integrated into formal learning environments in a way that enriches discussion, increases engagement and forms broad connections.

Educators highlight the lack of science content in Arabic and raise questions about the trustworthiness and credibility of scientific sources that students go to on social media. One educator observes: “Sometimes language can be a barrier especially that a low number of science resources is translated”. The aforementioned limitations could prevent social media from realising the rich opportunities identified in the literature. This highlights the need to support collaborative efforts to translating science content and collate credible science resources. One participant see that financial limitations could hinder the development of their own tools or resources.

The informal learning intuition has used a variety of social media platforms to connect with and engage the public; it aims to engage a wider audience, encourages their participation in its activities and also tries to inspire them to create their own. The interactive features of social media make it an effective tool for achieving the institution’s goals. The educators at this institution recognise the effectiveness of online communication through social media and repeatedly identify different benefits of communication and collaboration, including connecting the researcher with learners and the general public, fostering communication and collaboration within the organization, supporting the institution’s informal activities, and science communication. The institution’s activities require staff to communicate and collaborate every day, and they use communication and teamwork supporting tools like BaseCamp to facilitate this. Some educators describe discussions and coordination that are often conducted informally on platforms like Facebook messenger or WhatsApp groups. They also described using science-related mobile applications for informal science activities. The institution has channels/pages on Facebook, Flickr, Instagram, LinkedIn, Twitter and YouTube.

Although educators from the formal campus and blended learning institutions regard the use of social media for educational purposes positively, but some educators emphasize that it should support but not replace face-to-face learning. The majority of educators who work in formal learning institutions describe different social media affordances that benefit both educators and students. For example, most participating educators appreciate the richness and diversity of resources available on social media, and several have noted that it has increased opportunities for self-learning, expanded students’ research options and aided them in finding alternative tools and resources. On the other hand, educators frequently observe how social media benefits their personal and professional development. They described its role in facilitating their access to academic resources, connecting them to the academic community and keeping them informed about the latest developments in their fields.

Discussion of the Findings in Relation to the Conceptual Framework

Within the context of this study, many practices demonstrate the application of Connectivism by both educators and students. Many of the educator examples are connected to the eight principles that characterize Connectivism. The findings also demonstrate how some cultural factors influence educator and learner perceptions and the use of social media for educational purposes. Some examples are discussed in this section.

Although 55 percent of educators support extending connections with learners, some examples show that educators prefer to keep their personal and professional lives separate – indeed, almost a quarter

of educators (22 percent) prefer to keep a professional distance from learners. In one case, it was noted educators maintained their authority on social media groups, and this can be explained by referring to Hofstede's power distance dimension, which characterizes Arab culture as a high-power distance culture (Khalifah, 2010). Some studies refer to the impact of power distance culture on education in Palestine, with authority being transferred to the teacher or school principal (Mushtaha & De Troyer, 2007; Haj-Muhammad, 2013). But breaking the boundaries of hierarchy and authority was among the affordances of social media that motivated students and educators to communicate through informal platforms. Two educators cite the informal culture in Palestine as influencing their tendency to move to informal platforms. They also observe that some students feel empowered when expressing their ideas on social media platforms. One educator explains that "they don't feel the hierarchy that exists inside the class or on the learning management system". These examples show educators have different perceptions of the extent of the connection between educators and learners on informal platforms. Students also have concerns about freedom of expression when they interact on social media, which echoes Alabdullaziz's (2015) suggestion that students from collectivist⁵ cultures do not feel comfortable expressing personal opinions.

Educators explain how they use academic and professional networks to maintain contact with students lasts after they graduate, or a semester ends. They constantly see how social media helps them advance both personally and professionally. They discussed how it facilitated their access to academic resources, connected them to the academic community, and kept them up to date on the most recent developments in their disciplines. In the words of one participant: "I think social media is indispensable to keep me well-acquainted with science updates in my specialization". Siemens (2005) describes currency (accurate and up-to-date knowledge) as the intent of all connectivist learning activities. Trnova and Trna (2012) describe teachers' online collaboration with colleagues in other countries as an effective Connectivist educational method that makes it possible to exchange experiences, build new connections and apply new knowledge.

Another possible problem arises in the fact that the theory of Connectivism suggests that learners should be responsible for forming networks and connections. Garcia et al (2013) therefore suggest that the manner in which networks are formed make the network highly personalized and primarily the individual's responsibility. Palestinian students may therefore face some challenges because, in keeping with the teacher-centred learning approach, they may expect the teacher to take the lead in learning activities (Rabaya'h, 2013). Rabaya'h (2013) notes that students require some higher authority in online courses, whose knowledge and experience will guide them through the learning processes and attributes this to the hierarchical structure of Palestinian society. Along with culture, students' sense of responsibility for their own learning may be connected to the precise configuration of the education system in Palestine. Educators expressed concerns about students' dependency and the extent to which the culture of indoctrination prevails in Palestinian schools and impacts learning in other educational contexts, including universities. Shraim (2010), in expressing concern about the ability of Palestinian students to learn independently and take responsibility for their learning, refers to the persistence of traditional teaching methods in Palestinian schools.

Educators at formal institutions discuss how social media has produced role changes in their teaching, some educators provided examples of adopting new roles (including recommending online resources to their students) and providing them with online guidance. Siemens (2010) refers to the teacher roles in a Connectivist learning environment and observes that it includes drawing attention to content elements, ideas, and thoughts; providing learners with various information sources; and guiding students through their learning journey.

⁵ The individualism vs. collectivism dimension relates to the extent to which societies are integrated into groups. Collectivist cultures emphasize the needs and goals of the group (as a whole) over the needs and desires of each individual. (Williams, 2020)

Table 5 shows cultural aspects identified in this study and illustrates whether there is a direct connection to one or more of Hofstede's cultural dimensions.

Table 5. Cultural Aspects that Influence the Use of Social Media in Education in Palestine

Cultural aspects identified in this study	Connection with Hofstede's dimensions
Authority	Power Distance
Freedom of expression	Collectivism Power Distance
Tendency to socialization	Collectivism
Avoiding what is unfamiliar	Uncertainty Avoidance
Conservative culture	-
Informal culture	-
Sensitivity to making mistakes	-
Shyness	-
Sense of responsibility	-

Examples illustrate how certain Connectivist practices have been influenced by local culture in the Palestinian context. Others point out that various cultural aspects could exert different, and occasionally competing influences on educators and students' practices in online educational environments. This emphasizes the need for additional investigation including a large sample of educators and learners.

The data analysis shows the impact of Israeli occupation on culture in Palestine. For example, freedom of expression is identified as one of the cultural factors that affects the use of social media in education. This aspect is influenced by both culture and political situation in Palestine (Alabdullaziz, 2015; Abu Zayad, 2015; Taha, 2020). Abu Zayad (2015) describes the challenges that confront Palestinians when they try to use social media as a tool for freedom of expression, which include the Israeli authorities citing social media when arresting Palestinian activists. Haj-Muhammad (2013) suggests that the Israeli occupation should be considered when studying Palestinian culture. In addition, the application of Connectivism and its relevance to the Palestinian context is limited by Israel's control of Palestinian communications, cyberspace and mobility, which clearly limits Palestinian freedom of expression and activism in the digital space.

Conclusion and Suggestions

This paper reports on a study that explored the influence of culture on social media use in education in the Palestinian context. Semi-structured interviews were used in this study to explore how educators in three educational institutions perceive the integration of social media into undergraduate science education and informal community learning activities. The majority of participants recognized that social media could positively contribute to science education in Palestine (both formal and informal), but also voiced a number of cultural concerns that related to its influence on the use of available tools for teaching and learning purposes. Social media tools are, by virtue of their informal and social character, potentially well-placed to contribute to Palestinian culture and society and this lays a solid foundation for their further development and application. They can be applied as a response to challenges that currently confront the Palestinian education, and in particular mobility challenges caused by the Israeli occupation, and the lack of resources and advanced science equipment.

The results are inline with those parts of the literature (Joy et al., 2009, Yoon, 2015 & McDermott, 2017) that stress the importance of understanding how local culture impacts teachers' and learners' use and acceptance of emerging technologies. Palestinian educators have identified culture as an important aspect of social media use. In many respects the features of the tools map onto the society, and vice-versa. According to one respondent, "culture in Palestine is informal, thus we need to employ informal

tools to reach people". Palestinian culture provides a strong foundation for future enhancements of existing social media use, and it is also reasonable to believe that social media can be adapted to the (Palestinian) cultural and social context.

The study identifies nine cultural aspects that influence educators' perceptions of social media and its use for educational purposes. However, of the six dimensions that Hofstede identifies, only three (Power Distance, Collectivism and Uncertainty Avoidance) apply to one or more of the aspects: the other three (Masculinity-Femininity, Indulgence-Restraint and Long-term Orientation) have no relevance. The study reveals other cultural aspects that are not directly connected to Hofstede's cultural dimensions (such as conservativeness and informality). Therefore, the study suggests that Hofstede's theory provide a limited understanding of local culture and its influence on technology use in teaching and learning in Palestine.

It is also important to acknowledge and engage the wider political context, in Palestine, culture, along with almost all other aspects of Palestinian life, is highly politicized. The seven⁶ Arab countries that Hofstede's study addresses have very different economic, political and social circumstances. Although he successfully demonstrates the commonalities between Arab countries, his theory does not address exceptional circumstances like wars, conflicts, pandemics and natural disasters. As a result, it is necessary to adapt Cultural Dimensions theory, so it is better able to address and engage this political context; as a precondition, it is necessary to adapt it so that power distance, collectivism and uncertainty avoidance are adapted to the specific features of Palestine's (highly complex and fragmented) internal politics. For example, the collectivism dimension could be adjusted to acknowledge Palestinians' need for solidarity and collective resistance in response to the occupation. The Uncertainty Avoidance dimension could be adapted to take into account the general sense of uncertainty that Palestinians experience in their day-to-day lives – crucially, this should be understood as a consequence of the occupation but instead should be viewed as a tactic that enables and assists occupation practices; and the Power Distance dimension could be amended to acknowledge a situation where an enemy state exerts power over almost all aspects of Palestinian existence. One interviewee neatly summarized this when they observed that "maybe culture in Palestine is affected by many factors, the Israeli occupation is becoming part of the culture".

In addition, although aspects of Connectivism clearly relate to the experience/s of interviewees, several examples demonstrate how certain Connectivist practices have been influenced by local culture in the Palestinian context. And this shows that Connectivism as a 'learning theory for the digital age' which emerged in North America, needs to be critically studied before adoption. It is therefore necessary when examining how specific principles suggested by Connectivism theory are applied to the Palestinian educational context to consider the influence of culture and political situation. For instance, the theory of Connectivism suggests that students change from passive receivers of knowledge to full participants within their knowledge networks. This principle has to be re-evaluated while considering the influence of high power distance and hierarchical structure on student-teacher relationships in the Palestinian education context.

Another Connectivism tenet states that continual learning requires to nurture and maintain connections with information sources. Yet, it is beneficial to give careful thought to how Palestine's high power distance, conservative and informal culture could exert different influences on educators and students' practices in online educational environments. For example, Palestine's conservative culture may influence learners' or educators' desire to separate social and educational platforms. Additionally, in high power distance culture, learners and educators may have different perceptions of the extent of the connection between educators and learners on informal platforms, On the one hand, educators may prefer to keep a professional distance from learners or maintain their authority on formal educational platforms (e.g., LMS). On the other hand, learners may prefer informal tools due to their role in

⁶ specifically, Egypt, Iraq, Kuwait, Lebanon, Libya, Saudi Arabia and the United Arab Emirates

eliminating communication barriers and breaking the boundaries of hierarchy and authority in high power distance cultures.

The theory of Connectivism suggests that learners should be responsible for forming networks and connections, and it also contends that decision-making is itself a learning process. The study's key findings show that freedom of expression is influenced by both culture (e.g., collectivism, power distance) and the political situation in Palestine. As a result, it's crucial that the application of connectivism consider educators and learners' needs to have freedom of expression as well as any restrictions on it. There is also a need to consider the influence of collectivist culture on the predisposition of educators and students to engage in socialization, or to acknowledge that learners may prefer collaborative and collective activities than individual alternatives.

In conclusion, although the different theories can be applied in isolation, the limitations and contradictions that arise make it necessary to critically assess them before they are applied, and to adjust and apply them in combination. The two are mutually complementary insofar as Cultural Dimensions Theory directly addresses a weakness of Connectivism that becomes pronounced when it is applied to a specific context, and this is especially apparent in the case of Palestine. However, this 'amendment' is itself insufficient insofar as it fails to acknowledge the inherently political character of culture in Palestine. As a result, we emphasize the value of local knowledge production and sharing rather than dependency on Western importations.

In building on the study findings, educational institutions need to research cultural appropriateness before adopting any tool or platform for educational purposes, and they should also consider teacher and learner feedback. Institutions and policy makers need to investigate the feasibility of building new cultural-specific resources and resource banks that could give Palestine greater autonomy in how its education is provided and experienced. They should also create flexible policies that give educators more autonomy and provide them with the freedom to engage their students. Existing policies on digital tools also have a number of shortcomings, including the lack of updates or significant changes in policies related to digital learning, and bureaucracy (Wahbeh, 2006), and need to be addressed. Finally, researchers should investigate additional factors that could influence an individual's cultural horizons, including generational divides, gender, and online cultures. They should also examine learners' perceptions of the role of social media, as this study has only focused on educator perceptions.

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About the Author(s)

- Rami Muhtaseb (Corresponding author); r.w.muhtaseb@wlv.ac.uk; Institute of Education, University of Wolverhampton, UK; <https://orcid.org/0000-0003-3680-5073>
- John Traxler; john.traxler@wlv.ac.uk; Institute of Education, University of Wolverhampton, UK; <https://orcid.org/0000-0002-5284-709X>
- Howard Scott; howard.scott@wlv.ac.uk; Institute of Education, University of Wolverhampton, UK; <https://orcid.org/0000-0002-2995-2393>

Authors' Contributions (CRediT)

Rami Muhtaseb: Methodology, Writing – original draft; John Traxler: Conceptualization, Supervision, Methodology, Writing – review & editing; Howard Scott: Conceptualization, Supervision, Methodology, Writing – review & editing

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The authors do not declare any conflict of interest.

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