Undergraduate Students' Perceptions on the Use of Padlet as an Educational Tool for an Academic Engagement: Qualitative Study

Yousef M. Arouri[1(✉)], Diala A. Hamaidi[2], Aisha F. Al-Kaabi[2], Asma A. Al Attiyah[2], Marwa M. ElKhouly[2]
[1]School of Educational Sciences, The University of Jordan, Amman, Jordan
[2]College of Education, Qatar University, Doha, Qatar
y.arouri@ju.edu.jo

Abstract—This research study aimed at investigating the undergraduate students' perceptions of the opportunities and challenges of utilizing Padlet and its effects on academic engagement. The research followed a qualitative approach. Fifteen students from Qatar University's Research Methods course were intentionally chosen to demonstrate the diversity of specialization (humanitarian, scientific) and academic stage (first year – fourth year). Three semi-structured interviews were conducted to collect the research data that analyzed according to thematic analysis strategies. The researchers used two strategies for achieving trustworthiness in this study research. The findings of this research revealed that the participants were enthusiastic about their experience with Padlet. They mentioned various advantages related to academic engagement such as enhancing active learning. The participants highlighted the role of Padlet in enhancing critical thinking skills. Further, the provided feedback via Padlet was constructive. Despite the advantages, the participant also noted some difficulties encountered when using Padlet. Recommendations for higher education institutions and future ramifications were considered.

Keywords—Padlet use, undergraduate students' perceptions, academic engagement, advantages, challenges

1   Introduction and literature background

Technology has become an essential component in the lives of twenty-first century students, which has put educational institutions in front of challenges and pressures to benefit from it in the learning and teaching processes. Knowing the characteristics and importance of these technologies; guide these institutions at all levels to review their educational policies and practices; to ensure its effectiveness and harmony with modernity and renewal. Therefore, educational institutions began searching for the best methodologies to develop teaching and learning strategies that are enhanced by the innovations of technology that can be in harmony with the learning styles of twenty-first century students.

Such strategies should help student to be an active component in the learning environment, to be able to ask questions and participate in discussions and activities, and to provide opinions by creating educational opportunities for participatory learning using technology innovations that promote active learning based on cooperation and peer learning. Thomas [62] explained basic principles that should be adopted by the teacher in relation to the importance of student participation in learning environments, such as students sharing their visions, providing evidence of their active thinking, exposing their ideas to scrutiny and critical review by others, and cherishing their voices and working to use them wherever necessary. Romain [53] indicated that new technology has become a cornerstone and an important factor in encouraging active learning, creating students who are creative and able to solve problems. Al-Darwish and Abdel-Aleem [5] confirmed that technological innovations provide students with online virtual environments to communicate, collaborate, and share ideas.

1.1 Web 2.0

Blank and Reisdorf [11] indicated that the first appearance of the word Web 2.0 was during a meeting between O'Reilly and Media Live International in 2005 [47]. In this meeting, websites were classified according to their nature into Web 1.0 and Web 2.0. Romain [53] explained that Web 1.0 is characterized by the presence of static pages that do not provide interaction with the user, while Web 2.0 is characterized by the emergence of interaction on the Internet and the response to search requests of Internet users on the World Wide Web. Web 2.0 is a new concept that expresses a set of services provided through Internet technology that gives the user the ability to contribute to the development and enrichment of content on the network, and to increase interaction and cooperation between users to build virtual communities [4].

The term Web 2.0 represents a group of new technologies that allowed users to build their own database, able to modify, add or delete, and provide them with interactive systems that allow social communication to express their opinions, interests, and culture [61]. Examples of Web 2.0 services that are being used successfully in education include: Blog, Wikis, Social network, Podcasts, and Padlet. Chabonieh [17] outlined a set of Web 2.0 characteristics: including: 1) Web 2.0 technology gives full confidence to users to contribute to building content, 2) Web 2.0 technology works as integrated platforms that allow users to interact with them and use their components easily, 3) Web 2.2 technology has some smart features such as advanced search engines, and 4) Web 2.0 applications are easy to use; because there are user interfaces that are in tune with the capabilities of different users.

Web 2.0 applications play a crucial role in the field of learning and education in terms of their support for teachers in creating active learning environments that contribute to enhancing student learning and achieving educational goals. The importance of Web 2.0 continues to increase significantly in the educational process through the possibility of employing its applications in all educational levels, using it to sustain the educational process, and enabling school administrations to accomplish their tasks [66]. Bower [13] indicated that Web 2.0 applications enhance student cooperation with colleagues and integrate their creative abilities into a network to provide mutual assistance

and support, which contributes to facilitating the exchange of information, knowledge and skills between learners, experts, and specialists. In addition, Web 2.0 applications help the process of continuous learning and enhance students' self-control and enables them to accomplish various tasks in a variety of learning environments. Yunus et al. [65] explained that Web 2.0 applications can provide many opportunities for social interactions, by enabling students to discuss topics and ideas freely and socially, which contributes to making education collaborative and integrated, as everyone participates in editing, publishing, adding and commenting.

1.2 Padlet

Padlet provides a cloud-based application as a service, a real-time web-based collaborative system in which an unlimited number of users can upload, curate, and share content on virtual bulletin boards called pads [49]. Padlet is universal and comprehensive, provides over 42 languages, allows collaboration on its platforms from all over the world, supports (almost) every file type from Excel, Photos and Spotify, works on most computers and smartphones, and provides continuous support for users from through their approved communication channels [48].

Padlet is a web-based online wall that collects ideas via a virtual post from users and adds links, images, text, documents, videos, music, and files from Photoshop, Illustrator, Autocad, etc [48]. It can also embed content from anywhere on the web, including YouTube, Instagram, Twitter, Vimeo, The New York Times, and 400 other apps [57]. Padlet offers many benefits to users without the need to register for an account, and allows users to create walls for free, and invite others to collaborate on their walls by uploading files from their computers, taking a photo or video from their phone, or linking from the web [28].

Padlet is both familiar and fun, posts can be added with a single click, copy-and-paste, or drag-and-drop, changes are saved automatically, and a simple link sharing allows for quick collaboration [48]. Padlet can save documents and multimedia files from a virtual wall, copy, and paste them into any other application, and dynamically place them using several techniques. It can be used for simple tasks for beginners or experts and requires no special training [63].

1.3 Padlet in education: advantages and challenges

Several previous studies [22, 25, 31, 67, 68, 69, 70] that discussed the importance of Web 2.0 applications have agreed that Padlet can support collaborative learning activities and cognitive and social interactions during collaborative learning that encourage students to take a higher-level approach to creating new knowledge, Padlet also supports collaborative tasks encouraging creativity and innovation in learning. Hsu et al. [38] discuss several aspects of the importance of using Padlet in learning and teaching, including: 1) it contributes to the dissemination and exchange of information about learning to show collaboration, progress, and completion of learning tasks; 2) it documents the processes of transferring and disseminating information, thinking processes, and the resulting educational outcomes; 3) activities designed with Padlet contribute

to building meaningful and real communities of practice to build knowledge for the community. Wood [64] explained that using Padlet for teachers is very helpful; it helps them manage their interaction and performance in the classroom, by sending an email to notify the teachers each time students reply to the teacher's wall.

Bishop and Elen [10] asserted that Padlet as one of the emerging technologies of the 21st century has brought about new opportunities and learning possibilities. Stannard [59] added that the Padlet works well with activities such as brainstorming, discussion, and class assignments. Wood [64] showed that Padlet enables students to learn anywhere and at any time using any Internet-enabled devices such as a smartphone, tablet, and computer connected to the Internet, students can share their work on Facebook, Google+, email or even include the URL in their blog.

Based on their many experiences using the Padlet in higher education institutions, the researchers believe that the Padlet can be used in education for reflection activities and group collaborative posts by raising issues or discussion questions to be posted on the Padlet wall. This posting provides an opportunity for students to post their answers on the wall individually and what others contribute by adding responses. This process enables immediate access to a wide range of peer responses rather than just a few. After completing the task of sending the responses, the teacher can ask the students to join small groups that analyze a specified number of responses. The process of analyzing responses allows students to see the various responses that contribute to creating opportunities for peer learning and self-assessment. These responses are also an effective means in achieving formative evaluation, which helps the teacher in determining teaching strategies that are appropriate to the needs of students.

Despite the advantages available in using Padlet, as a Web 2.0 tool, in learning and teaching, there are challenges that both students and teachers may face that prevent them from achieving the optimal use of this tool. Some studies [7] have shown that the integration of Web 2.0 tools into the practices of teachers and students does not guarantee the achievement of learning goals, and the successful employment of these tools and their integration into education requires the creation of new teaching strategies that are compatible with this integration. Ahmed et al. [1] indicated that the psychological aspect may play an important role in not accepting the use of Web 2.0 tools in learning, as students may feel uncomfortable or insecure when they announce themselves or open up to others. Siddiquah and Salim [58] added that technical problems such as viruses, the use of computers with low specifications, and slow Internet services are among the most important obstacles that prevent the optimal use of technology in teaching and learning and cause anxiety among teachers and students.

1.4 Student engagement

Defining student engagement as participating in effective educational practices in diverse learning environments [50]. Bomia et al. [12] define engagement as the student's desire, needs, motivation, and success in the learning process. Hu and Kuh [39] believe that engagement is the quality of the student's effort to accomplish meaningful learning activities that directly contribute to achieving the desired results. Gunuc and Kuzu [32] describe student engagement as the behavioral, cognitive, and emotional

responses of students to the learning process in diverse learning environments to achieve intended learning outcomes.

Behavioral engagement is based on the idea of participating in classroom activities, and includes attending, following the rules, adhering to class standards, and participating in the completion of various activities, such as academic and social, to achieve positive academic results [29]. Cognitive engagement is determined by the student's level of investment in learning, and includes the value given to learning, learning objectives, self-regulation, and planning [30]. Emotional engagement includes students' reactions to the teacher and peers, the cognitive content of instructional materials, and the learning environment that includes all attitudes, interests, and values [16].

Student engagement allows students to work effectively with peers, create sustainable networks with them, and make decisions based on personal values and personal integrity in complex and socially diverse contexts [34]. Student engagement gives students the development of academic, cognitive, and analytical skills to move on to further learning at higher levels [60]. Hansen [35] demonstrates that student engagement contributes to creating independent, responsible, and lifelong learners who possess 21st century skills that enable them to think creatively, communicate, collaborate, and solve problems.

In line with the previous discussion related to the importance of student engagement, designers of different learning environments and curricula should consider in their design providing opportunities for students to express their ideas, interests, experiences, points of view, and personal opinions to support active participation. Thomas [62] shows that structures and processes that enable feedback and negotiation give students the freedom to express their needs and interests, which contributes to developing a sense of control over their learning environment. Further, designing activities as personally meaningful reinforces that what students engage in is useful, informative, and relevant to future goals. Furthermore, a well-designed curriculum delivered through the use of learning activities should foster the development of an intellectual environment that stimulates discussion and discovery, challenges creativity, provides opportunities for active participation, and leads to high-quality education.

1.5 Student engagement and technology

Students' engagement in learning, through the integration of technology such as the Padlet application, contributes to creating engagements on the behavioral, cognitive, and emotional levels. The immersion of students in learning through technologies not only affects the behavioral performance represented in asking questions, participating in interactive activities, and completing assignments, but also affects the cognitive performance of students by transferring them to the impact of learning and applying new knowledge to various relevant situations and evaluating them [40]. It also influences emotional functioning in terms of learners' satisfaction with their achievements, willingness to participate in learning activities, and feelings of self-worth in peer interactions [42].

Students should be fully involved in learning using technology on a quantitative and qualitative level, self-control, and self-management, learn consciously, communicate

with peers and teachers, and provide guidance to others [41]. Collaborative interactions provided by ICT and Web 2.0 tools such as Padlet enable students to communicate with their classmates and teacher, access information to gain knowledge, and then transform it into an effective representation in their minds through comprehension [20]. In addition, the Padlet as a tool for creating collaborative interactions may serve as a bulletin board allowing students to post their ideas, questions, and answers, discuss their peers' responses for evaluation, and reveal the metacognitive processes behind students' thinking [28].

1.6 Employing technology in educational institutions in Qatar

The Ministry of Education and Higher Education has defined a clear vision and mission and a set of values on the basis of which it works to serve the educational system. The Ministry's vision was to be pioneers in providing permanent and innovative learning opportunities of high quality for students, while its mission was to organize and support high-quality learning opportunities for all stages and levels, with the aim of developing the necessary knowledge, skills, and attitudes for students in a way that suits their potential and capabilities in accordance with national values and needs [46]. In order to achieve the vision and mission, the State of Qatar, with great interest, is preparing and equipping the infrastructure for the various educational institutions and providing the buildings in the educational institutions with everything that would support and develop the educational process and make it happen in a distinguished manner in accordance with international quality assurance standards [54].

Qatar University is one of the educational institutions that constantly seeks to achieve advanced positions in the quality of education, according to the indicators of activating and employing technology [6]. It holds specialized educational conferences to develop and promote joint research between researchers in the fields of education and information technology in order to improve the quality of education [44]. In order to support the university's strategy towards innovation and digital transformation and activate the teaching and learning strategy, the university has launched many initiatives within the pillars of excellence in education, such as: digitization-enhanced learning and pioneering education, which develop students' digital skills and knowledge, and enhance their ability to innovate and learn for life [3].

Qatar University [51] and Microsoft Corporation have concluded a cooperation agreement to facilitate the efficient and effective use of information and communication technology to improve education and training at the university. The agreement includes the creation of a professional development platform that serves the needs of education stakeholders across all departments of the university. This platform serves as a single reference point for all educational content related to teaching and technology and supports the desire to innovate through the use of technology in everyday learning.

In light of Qatar University's interest [52] in the sustainability of technology-based teaching, the university developed performance indicators and evaluation model for teaching and learning. Among these indicators, there is an item that measures the effectiveness of teaching and learning, innovation in education, and benefiting from the pillars of excellence in education. This item included the need to use modern technology

in designing learner-centered learning environments, based on experimental practical application, based on scientific research, enhanced by digitization, and supportive of leadership. In addition, this item included the need to use many teaching methods that ensure the effective participation of students in the educational process and the achievement of learning outcomes.

1.7 Theorical framework

Based on the vision of Fuchs [31] that teachers should adopt new strategies that will align with the interests of their students to engage in different ways and provide a range of opportunities. And based on the ideas of the Campus-Class-Technology (CCT) model [32] in explaining the relationships between student engagement and technology, which confirms that the effective integration of technology in learning environments is important to increase student engagement in class, which leads to an increase in students' academic achievement and positive results. This study came to reveal the effectiveness of digitization-enhanced learning provided by Qatar University and its contribution to creating effective student engagement on the behavioral, cognitive, and emotional levels.

1.8 Previous studies

The objectives of the previous studies were divided into three areas as follows:

The first field: studies that investigated the effectiveness of using Padlet in enhancing students' engagement in learning. Megat Mohd et al. [45] aimed to investigate the effectiveness of Padlet use in advancing activities to engage and motivate students in active learning. The quantitative method was used by distributing a questionnaire to a sample of graduate students in Malaysia who enrolled in a business statistics course. The results showed that active learning through Padlet has a significant impact on improving students' participation in classroom activities. Participation was measured by factors such as motivation, active learning, collaboration, opportunity to learn, interest, ease of use, and satisfaction. Further, Al Momani and Abu Musa [2] discussed some of the ways—collecting research resources, class resources, class notes, FAQs, brainstorming, and online dialogue—that Padlet can be used to facilitate interaction and collaboration in distance learning. The quantitative method was used by distributing a questionnaire to a sample of postgraduate students in Jordanian universities. The results showed a very positive attitude towards Padlet as an online interactive and collaborative tool. The results also showed that there was no significant difference in the means of the sex variables. Furthermore, DeWitt et al. [23] examined the effectiveness of using the Padlet in a synchronous online debate among students learning about computers. A mixed qualitative and quantitative approach was used by distributing a questionnaire and conducting interviews with undergraduate students in a Malaysian university. The results indicated that students could learn and generate new ideas when using this tool. Hence, Padlet can be used for collaborative learning in the form of debate to get new ideas.

The second field: studies that investigated the effectiveness of using Padlet in improving students' achievement in text writing. The study of Fadhilawati et al. [26] and Fadhilawati et al. [27] aimed to investigate the effectiveness of using Padlet in improving student achievement of writing procedure text and writing recount text in schools in Indonesia. The quantitative method was used by conducting tests and distributing a questionnaire to collect and analyze data. The results showed that using the Padlet to teach action text writing can increase students' achievement in writing a text. The results also demonstrated that using Padlet as a means of learning to write a recount text can enhance students' learning outcomes. Furthermore, the students presented a positive attitude towards using the Padlet to teach and learn to write action scripts and personal anecdotes. Further, Lestari & Kurniawan [43] examined the effectiveness of using Padlet can improve students' mastery of descriptive writing for students of the Department of English in Indonesia. The quantitative method was used by conducting tests and distributing a questionnaire to collect and analyze data. The results showed that all students performed all tasks with Padlet. In addition, the use of the Padlet application as media improved students' writing proficiency. Furthermore, Awaludin et al. [8] explored the perceptions of undergraduate students in Malaysia using Padlet and how it stimulated and helped them increase their interest in writing in English. The quantitative method was used through the questionnaire to collect and analyze the data. The results showed that the use of the Padlet as an educational tool was encouraging, but there are some challenges that must be considered when using the Padlet as an educational tool.

The third field: studies that investigated the effectiveness of using Padlet in improving students' academic achievement. Saleh's study [55] revealed the effectiveness of a proposed educational model based on the use of the digital wall "Padlet" for teaching social studies in developing historical concepts and academic engagement for fifth-grade students. The research relied on the descriptive and semi-experimental approach to collect and analyze data. The results showed the effectiveness of the proposed teaching model in developing historical concepts and academic participation. Further, Baidoo et al. [9] examined the efficacy of an educational Padlet as an energizer for student performance on some environmental concepts in secondary schools in Ghana. A quasi-experimental design was adopted for the study. The results showed that students who were taught using Padlet were statistically superior to their peers who were taught using a traditional lecture-based educational approach in terms of their academic performance. The results also revealed that the interaction effect of educational approach and gender was not statistically significant. Furthermore, Haris et al. [36] revealed the effectiveness of using the Padlet in improving the English grammar learning of university students in Malaysia. The quantitative method was used to collect data through tests and questionnaires. The results of the tests indicated a significant improvement in the students' performance. The result of the survey also showed a high preference and positive attitude of the participants towards the use of the Padlet as a means of learning grammar. The results also indicated that the use of Padlet is effective in enhancing students' performance in language learning.

In conclusion, after reviewing previous studies, this study is distinguished in terms of its objective, as it combined the disclosure of undergraduate students' expectations of using Padlet as an educational tool for academic engagement, and how they perceive

the advantages and challenges of using this tool. Further, it is distinguished in terms of the place it was held, as it is the first study – as far as the researchers are aware – to be held on the effectiveness of using Padlet in higher educational institutions in Qatar. Furthermore, it is distinguished in terms of the nature of the study members, as it is the first study – according to the knowledge of the researchers – that brought together students from various humanities and scientific university specializations and from different levels who shared their experience with Padlet. The participants in the study are the students who have studied the Research Methods course as a university requirement for all university students.

1.9   Study problem and question

The integration of technology into various learning environments has become an essential requirement in the process of enabling students to possess twenty-first century skills and contributes to creating learning environments suitable for participating in cooperative interactions that give students opportunities to discuss topics and ideas freely, individually and collectively, to contribute to making teaching and learning among them cooperative and complementary [65]. Although students, especially in higher education institutions, are responsible for their own learning and participation, these institutions have a role in enhancing participation by providing conditions that promote appropriateness and provide possible opportunities [37].

Qatar University has taken many procedural steps that require directing faculty members in various colleges to activate the university's strategy towards innovation and digital transformation and activate the strategy of teaching and learning enhanced by digitization, which ensures the active participation of students in the educational process and the achievement of learning outcomes [52]. Although teachers at the university respond to these procedural steps and activate the strategy of teaching and learning enhanced by digitization, there is limited research that directly reveals the relationships between the effectiveness of integrating technology such as Web 2.0 tools such as Padlet in learning environments and its impact on developing the dimensions of student participation, especially in higher education institutions in Qatar.

DeWitt et al. [24] demonstrate that there is an urgent need for further investigation of digital collaborative tools that can be used to generate new knowledge among undergraduates. Hsu et al. [38] indicate that research is needed on the potential of Web 2.0 tools such as Padlet to explore the possibilities of using these tools for collaborative learning and teaching in higher education institutions. DeWitt et al. [23] stress that more research on Web 2.0 tools is needed to explore emerging technologies and determine whether these tools can improve learning.

The experience of the researchers – as faculty members at a higher education institution in the State of Qatar – indicates that the use of Padlet as an educational tool in building thinking activities and collaborative participation contributed to providing students with the opportunity to learn in environments that increased participation in cooperative interactions. These collaborative interactions enabled students to communicate and discuss ideas freely, gain knowledge, and create opportunities for peer learning and self-assessment. Therefore, the primary purpose of this study is to investigate

undergraduate students' perceptions of the opportunities and challenges of utilizing Padlet and its effects on academic engagement of students. This study came to answer the following main study question: What are undergraduate students' perceptions of the opportunities and challenges of utilizing Padlet and its effects on academic engagement.

1.10 Study objectives and importance

This study aims to explore the university students' perceptions of the effects of utilizing Padlet on their academic engagement. Further, it attempts to investigate how do university students perceive the advantages and challenges of utilizing Padlet as an educational tool that affects academic engagement.

The importance of this study can be identified in the following: First, the subject of this study responds to the recommendations of previous studies [23, 38] that stress the need to conduct further research on Web 2.0 tools to examine new technologies and evaluate whether they might enhance learning. As a result, this study discusses some of the requirements of the digital age, as it sheds light on Qatar University students' perceptions of the opportunities and challenges related to the use of Padlet and its effects on students' academic engagement. Second, it is hoped that this study will provide a theoretical framework on QU students' perceptions of opportunities and challenges related to Padlet use and its effects on students' academic engagement. Third, the results of this study are expected to open the way for researchers to conduct more research and studies related to the use of Padlet in public and university education. Fourth, the results of this study may contribute to urging faculty members and students in the humanities and sciences colleges at Qatar University to employ Padlet as a tool in learning and teaching. Fifth, it is hoped that this study will help the university administration and those concerned with developing the learning management system (Blackboard); By including Padlet on a larger scale, to improve its usability in line with the needs of twenty-first century students.

1.11 Procedural definitions of study terms

In this study, there are many terms that need to be defined procedurally, as follows:

Padlet: An interactive virtual platform created by the Research Methods course instructor at Qatar University, to enable students of the course to access it and use the tools of this platform to achieve the course objectives by encouraging students to collaborate, share knowledge, express opinions, and experiences, and enhance their academic engagement.

Academic Engagement: It is the behavioral, cognitive, and emotional reactions – of students of the Research Methods course at Qatar University – to the learning process in an environment enhanced by the Padlet tool to achieve the desired course objectives.

Advantages of Using Padlet: The benefits students get in the Research Methods course at Qatar University, and the positive issues they experience when applying learning in a Padlet-enhanced learning environment.

Challenges of using Padlet: the obstacles and difficulties faced by students in the Research Methods course at Qatar University, and the negative issues they experienced when applying learning in the Padlet-enhanced learning environment.

Student Perceptions: The opinions and perspectives of students of the Research Methods course at Qatar University on the opportunities and challenges related to the use of Padlet and its impacts on their academic participation. These perceptions are obtained by responding to the study instrument.

1.12 Study limits and determinants

This study is determined by the following: 1) Spatial limits: This study was limited to the scientific and humanities colleges at Qatar University. 2) Human limits: This study was limited to female students of the scientific and humanities colleges at Qatar University. This is because no male student was registered for the Research Methods course. 3) Time limits: This study was conducted in the spring 2019 semester. 4) Objective limits: This study was limited to identifying Qatar University students' perceptions of the opportunities and challenges related to the use of Padlet and its effects on students' academic engagement. Further, Qualitative studies require that the researchers themselves collect, analyze, categorize, and code the data to reach the desired results. Therefore, the credibility of the results of qualitative studies is determined by the ability of researchers to complete these stages. It is also determined by the objectivity and expertise of researchers, the extent of student cooperation, and the nature of the study instrument (interviews).

2 Method and procedures

2.1 Study methodology

The qualitative approach was used in this study to explore Qatar University students' perceptions of opportunities and challenges related to Padlet use and its effects on students' academic engagement. The nature of this qualitative approach allows Qatar University students the flexibility to talk in depth about their attitudes and opinions on the subject of study [21].

2.2 Participants

Participants were chosen purposefully, due to the ability of these individuals to give information relevant to the subject of the study [19]. The number of participants in this study was 15 students who studied the Research Methods course at Qatar University in the spring semester 2019. These students are from the undergraduate level and from all the humanitarian and scientific faculties and from different years. Their ages ranged from 18–24 years. When selecting the participants in the study, the diversity of specialization (humanitarian, scientific) and the diversity of the academic stage (first year – fourth year) were taken into consideration.

2.3 Study instrument

Semi-structured interviews were conducted because they are suitable for different age levels, provide an opportunity to track interesting matters, allow the possibility of rephrasing the questions in a way that makes it easier for the participant to understand the question, and allows the researchers to collect a large amount of data and information [15].

Three types of interviews were considered: (a) in-depth phenomenological-based interviews, (b) e-mail interviews, and (c) focus group meeting with students. The researchers followed a modified form of the in-depth interview method [56]. Based on this modified form, the first interview was a face-to-face interview. It lasted 30–45 minutes and was conducted in one of the researchers' offices in the College of Education at Qatar University. The purpose of this interview was to understand the perceptions of QU students about the effects of Padlet use on their academic engagement. The second interview was conducted via email to allow participants to reflect on their experiences in the time available to them. This interview focused on understanding QU students' perceptions of the positive benefits of using Padlet as an educational tool affecting academic engagement. It took the students two weeks to respond electronically to the open-ended questions. The third interview was a focus group interview with all participants. The focus group was conducted in one of the halls of the College of Education at Qatar University. The focus group interview lasted an hour and a half. The researchers believe that the use of a focus group has an added value in this research because the participants have an opportunity to hear and discuss the opinions of others. The purpose of the third interview was to understand the perceptions of QU students about the challenges students face while using Padlet as an educational tool and affect academic engagement.

Many procedures were followed to ensure a suitable environment that enables the participants to speak freely and openly. First, at the beginning of the first and third interviews, care was taken to build a friendly relationship with the participants, and to remind them of their right not to answer any question they wanted without giving reasons. Second, they were told that the recording would only be available to researchers and would be destroyed after recording the data. Third, the participants were consulted on whether they would like to use pseudonyms during the interview. Fourth, all interviews were recorded using a smartphone application.

2.4 Data analysis

The interviews conducted using the Microsoft Word program were transcribed for examination and analysis according to thematic analysis strategies [14]. In the stage of familiarizing yourself with your data, the interviews were transcribed, and the data read several times to immerse themselves in it, to allow an opportunity to identify the main ideas of the data. In the stage of codes initial generating, the data has been categorized into meaningful text chunks and defined, arranged, and appropriately labeled. In the stage of themes for searching, the codes were collected and sorted to form themes. In the stage of themes reviewing, the proposed themes and their codes were reviewed by ensuring the interrelationship between the fragmented text, code, and theme. In the

stage of defining and naming themes, the data was finally reviewed, and some codes and themes were given more clear names to better reflect the meaning of the data. In the stage of the report the producing, codes and themes were discussed, and included illustrative details regarding QU students' perceptions of opportunities and challenges related to using Padlet and its effects on academic engagement.

2.5   Trustworthiness

Creswell and Creswell [18] suggest that enhancing the credibility of qualitative research requires an awareness of validity, relevance, transferability, and dependability. As a result, the researchers used two strategies for achieving trustworthiness in this study. First, all interview transcripts were sent to the participants via email. They were asked to review and read it carefully and comment on it or delete or add to the text of the interview if necessary. The response of the participants was positive, and they expressed their satisfaction with the accuracy of the data. Second, each researcher separately read the data many times and built the initial codes, then searched for themes, then reviewed the themes, then named and defined the themes. After this process, the researchers held several group sessions to discuss what had been reached, and then agreed among them on the final codes and themes.

3   Study results and discussion

The following themes are the results of the main study question: What are undergraduate students' perceptions of the opportunities and challenges of utilizing Padlet and its effects on academic engagement?

3.1   Padlet and active learning

As a response to the research main question about students' perceptions of the effects of utilizing Padlet on their academic engagement, most of the participants emphasized that Padlet motivates them to participate, exchange useful information, and express diverse opinions with their colleagues. For example, one of the students stated, "*When the instructor puts a prompt for discussion, I have a competition to answer before everyone else. Padlet prompt encourages me to participate actively*". Another student added, "*Padlet helps me as a learner to participate more, some students do not prefer to participate in the classroom and speak in front of their colleagues. However, Padlet allows everyone to express his or her opinions and answers comfortably and easily*". These findings coincide with Hsu et al. [38] insights that Padlet contributes to spreading information and building learning communities that aim to build knowledge among learners.

Some of the students indicated that Padlet contributes to organizing and clarifying the information that has been studied in a way that makes it easier for the students to deal with. One of the students said, "*I can know the summary of the lecture and the important points in it*". Another student added, "*Padlet walls collect information and*

put them together in one place so that it is easy for me to retrieve". Further, the participants point out that Padlet was helpful at the beginning of the classes. One participant indicated, "*Responding to Padlet helped me remember the information that was explained in the previous lecture and linked it to the new topic*". Another student added, "*The Padlet helps me retrieve and remember the information that was studied in the class. It also makes me active by writing down the information I gained from previous classes and presenting it to my colleagues to view*". These insights are similar to the findings of Megat Mohd et al. [45] that active learning via Padlet has a substantial impact on enhancing students' participation in classroom activities.

Some participants indicated that Padlet increases their attention in the classes. Some activities were posted on Padlet walls, and the students focused their attention to respond to them successfully. One of the students commented, "*I pay attention to the class to answer the posted activity easily*". Another student mentioned "*the activity is posted, and we answer it individually or in groups*". In addition, they mentioned that Padlet helps in providing constructive feedback. A student said, "*I present my answers, and then the instructor and the students comment on my answers, that helped me benefit more from their opinions*".

3.2 Effective Interaction between learning community members

The students talked about how the Padlet offers numerous opportunities to improve interpersonal communication and connection with the course instructor. The majority of students concentrated on how the Padlet aids by enabling reading and viewing of each other's posts so that they can learn from them and ensure that their replies are accurate. One of the students said, "*It speeds up our communication, we look at one other's responses, and we gain more knowledge from the posts*". The students also remarked that the Padlet gives them the chance to comment on one another's responses. The opportunity to learn from the faults of others was provided by the instructor's ability to comment on the students' responses. One of the students commented, "*Padlet improves our cooperative connection with one another. I learn from the posted opinions and fully understand what is required*". The students remarked that they are more enthusiastic and motivated as a result of utilizing the Padlet. A student said, "*It enables me to respond to the question promptly and enthusiastically*". Another student chimed in, "*It boosted my desire and incentive to answer before my colleagues when the instructor posts a topic or a video that needs discussion*". The students also discussed how the Padlet gives students the chance to work in small groups inside a single class, which promotes cooperative learning. One of the students stated, "*Sometimes the Padlet participation depends on the group's collective solution, therefore we must work together to get the necessary answer, then a student posts it to the class*".

The previous findings coincide with Al Momani and Abu Musa [2] study that revealed that when utilizing Padlet, students can learn and produce new ideas. As a result, Padlet can be utilized for collaborative learning in the form of debate in order to generate new insights.

3.3 Padlet as a critical thinking tool

The participants commented on the role of Padlet in developing critical thinking skills among learners. One of the participants said "*When the instructor brings up a subject on Padlet, my colleagues respond. So, I gather my ideas, organize, analyze, and develop them into a thoughtful, creative response*". Another student said, "*After reading the answers of my colleagues, I commit myself to presenting different and modified ideas*".

The majority of the students concurred that they gained new knowledge through participation in the Padlet-based interactive conversations, which significantly aided in learning and improving higher thinking skill and information exchange. According to them, using Padlet was a great experience that improved learning, as one student explained, "*For us as learners, using Padlet is a novel concept, but it is a concept that breaks up the monotonous routine. Exchanging experiences is beneficial, as is the case when we present our activities to our colleagues*". Another student stated: "*The Padlet is a new learning method that differs from conventional teaching methods. In a short amount of time, we can read everything that our colleagues have written*".

Padlet increases students' desire to learn because every student has a unique thinking in taking notes. A student stated "*When the instructor explains something, I record a note while others record other notes. This helps us to take others' opinions and benefit from them*". Another student added, "*The Padlet enhanced my desire to learn through its ease and being different from the traditional activities and participations that take time and effort. The student's presentation of their participations made me excited and became more positive. For example: when the instructor discusses, reads, and comments on the posts' validity. This encourages me and increases my motivation and enthusiasm to write new posts to know if my participation is right or wrong*". Some students also mentioned how the Padlet fosters students' internal motivation to learning new skills. One of the students said "*As was the case when we participated in writing the research, there is an internal urge to participate and interact when we enter the Padlet and view the posts. The discussion provided a wealth of knowledge that was used to successfully write the research*".

When using the Padlet, students engage a range of learning processes, which results in a deeper and more precise knowledge. Information retention is considerably simpler than it ever was, as one of the participants noted, "*The students wrote what they learned after each class. Both the students and I benefit from this, as I learn more. Any concept that I struggled to learn in class, I can grasp because some colleagues explained it in the Padlet*". The Padlet also helps with feedback that avoids misunderstandings and enables instructors to devote more time to assisting students. A student commented, "*Padlet assisted me greatly by providing continual feedback from the instructor, when we discussed how to write the scientific research, there was input from the instructor on whether what I wrote was correct or incorrect*".

3.4 Padlet and assessment of learning

The participants mentioned that the Padlet serves as an assessment tool. Many students indicated that utilizing Padlet gave them the opportunity to receive feedback from peers. One of the students said, "*It gave me the opportunity to write what I understood*

from the class and discuss my ideas with the instructor. I also benefit when I see the rest of the opinions my classmates write". Another student added, "*I benefit from the students' comments on my posts*". The other student said, "*It allows me to read the answers and collect information and ideas from my fellow students*". The comparison of replies posted on Padlet walls assisted students in evaluating their work. One of the students stated, "*I can evaluate my responses by glancing at the answers of my colleagues*". Some students, on the other hand, underlined that the instructor feedback is an excellent means of testing students' learning, as one of them stated, "*Our instructor examines the posted answers with us and then summarizes the proper response*". Another method of gauging learning via Padlet was self-assessment. One of the students commented, "*When I go back to my prior posts, I can see the breadth of my improvement*". Another student said "*Each time the instructor asks a question at the beginning of the class, I check to see whether I recall everything that was covered in the previous class. I also see how I react to the activities that are being offered on Padlet. I was able to evaluate my level of knowledge on the subject*".

3.5 Advantages and challenges

In addition to the mentioned insights above, in the focus group meeting, the participants summarized the benefits of using Padlet. They mentioned that Padlet is an engaging teaching strategy that makes it simple for students to participate without feeling self-conscious. Padlet eliminates the awkwardness and anxiety associated with replying at any time. Another major benefit is how simple it is to access Padlet by simply clicking the link. Any sort of document, including videos and articles, can be shared by the students.

The fact that there is no need to log in from the university website or from another site is one of the benefits mentioned by the students. Additionally, Padlet provides the student time to respond after studying other people's responses and work. After the topic has been covered, the posts can be preserved, and the answers are still accessible so that anyone can refer to them in the future. One of the key positive aspects of Padlet was the constant communication with the doctor and the feedback it provided.

The obstacles mentioned by students in utilizing Padlet were few. One of them was related to weak internet connection. One of the students commented: "*Sometimes I face Internet disconnection while responding to Padlet*". Further, few students faced technical issues. One of them said, "*At the beginning I did not know how to use Padlet. I could not attach an example of experimental study. I did not know how to attach it to the Padlet*". Previous studies such as Siddiquah and Salim [58] highlighted that significant impediments that limit the best use of technology in teaching and learning and cause concern among instructors and students are viruses, the usage of computers with low specifications, and slow Internet access. Consequently, it is recommended to provide technical support for students who may face such obstacles. Some students pointed out that they have weak writing skills, as one of the participants said, "*Sometimes I do not know how to formulate the answer on Padlet*", and this in itself sheds light on the role of learning methods in revealing the hidden weaknesses of the students.

The participants also mentioned that they had limited time to participate in some Padlets. one of the students made the following comment: "*One of the challenges*

I faced was the lack of enough time for some of the topics that the instructor provided. This occasionally makes it challenging for me since I do not have enough time to prepare and arrange my answers". Additionally, the students clarified that even though there is a location set aside for the earlier works that were discussed in the Padlet, students cannot change those responses or add comments after saving the Padlet.

For some students the only barrier is the belief in these innovative techniques, as there are some beliefs that prevent the integration of these interactive tools into the educational process. This result agreed with Ahmed et al. [1] that revealed the psychological element of not accepting the usage of Web 2.0 tools in learning can be one of the challenges, as students may feel uncomfortable or uneasy when they announce themselves or open up to others. As a result, adequate training for the students is required to help overcome this aspect.

4   Conclusion, recommendations, and future implications

The purpose of this qualitative study was to investigate the perspectives of undergraduate students from various specializations at Qatar University regarding the use of Padlet. The participants were quite pleased with their experience. They indicated numerous benefits, such as Padlet's excellent role in pushing students to be attentive and participate and voice varied perspectives with their peers.

Padlet helps to organize and clarify information for learners in a way that allows students to apply critical thinking abilities while reading, reflecting, and commenting on the participation of their peers. Padlet also boosts students' enthusiasm to study because each student approaches dealing with Padlet differently. According to the Students, formative evaluation via Padlet was a success. They were evaluated by their peers, by their instructors, and by themselves.

Although the participants revealed high level of satisfaction and mentioned many benefits from using the Padlet, they also discussed some obstacles encountered when using the Padlet as a learning tool. The constraints include limited Internet connectivity and technical difficulties in replying to the Padlet. Furthermore, the short duration of some Padlet posts influences the accuracy of the students' responses.

In conclusion, when undergraduate students used Padlet, they were inspired. It allowed them to successfully exercise critical thinking skills. They also used a range of assessment tools, including peer assessment, instructor assessment, and self-assessment. The study's findings pave the way for future research on the long-term effects of Padlet on undergraduate students.

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6 Authors

Yousef M. Arouri, Associate Professor of Educational Learning Technologies, The University of Jordan, Jordan. y.arouri@ju.edu.jo, +962799664701. https://orcid.org/0000-0002-0391-433X. Corresponding Author.

Diala A. Hamaidi, Professor of Early Childhood Education, Qatar University, Qatar. dhamaidi@qu.edu.qa, https://orcid.org/0000-0003-4874-1396.

Aisha F. Al-Kaabi, Assistant Professor of Educational Technology, Qatar University, Qatar. aisha.alkaabi@qu.edu.qa.

Asma A. Al Attiyah, Professor of Special Education, Qatar University, Qatar. aalattiyah@qu.edu.qa, https://orcid.org/0000-0003-4430-2038.

Marwa M. ElKhouly, MA Student, College of Education, Qatar University, Qatar. melkhouly@qu.edu.qa.