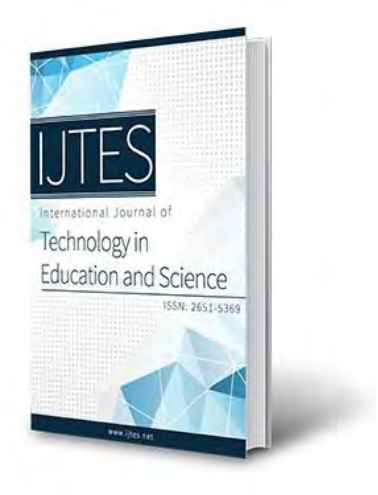

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Faculty's Use of Social Media in Flipped Classrooms: A Mixed-Method Investigation

Majed Alharthi
University of Jeddah, Saudi Arabia

Ke Zhang
Wayne State University, USA

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Faculty's Use of Social Media in Flipped Classrooms: A Mixed-Method Investigation

Majed Alharthi, Ke Zhang

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Abstract

This paper reports a sequential mixed-method study on Saudi Arabian (SA) faculty's use of social media (SM) in flipped classrooms (FC). The study also examined SA faculty's related attitudes and identified factors that had limited faculty use of SM in Saudi higher education. In particular, the study explored how SA faculty used SM to address students' needs and preferences as per the Read, Reflect, Display and Do (R2D2) framework. 391 eligible SA faculty members (199 male and 192 female) participated in the online survey, among which 8 (4 male and 4 female) were also selected for individual, semi-structured interviews afterwards. A wide range of factors were identified to understand what may have prevented or limited faculty's SM uses in teaching. Research and practical implications were discussed, as well as suggestions to promote the use of SM for teaching in SA and countries with similar cultures.

Introduction

Social media (SM) play a significant role in people's lives (Tess, 2013); and SM technologies are increasingly available in higher education (Dabbagh & Kitsantas, 2012, Tess, 2013). With the cancellation of temporal and spatial restrictions, they help in creating a robust relationship between formal and informal learning (e.g., Gao, Luo, Zhang, 2012; Zhang & Gao, 2014; Zhang, 2015). Flipped classrooms (FC) may incorporate widely accepted SM in the teaching and learning processes. As one of the student-centered pedagogical approaches, FC may increase students' active participation and promote collaborative activities in time-efficient ways amongst students, as well as between students and the instructor (Wilson, 2013; Acton & Knorr, 2013; Estes, Ingram, & Liu, 2014; Keengwe, Onchwari, & Oigara, 2014; Avary & Panayota, 2021). Technology is a key element in implementing FC (Bishop & Verleger, 2013). In a recent study, Zainuddin & Halili (2016) reviewed 20 publications on FC in 2013–2015 and found that a wide range of technology tools and online platforms had been used in FC. With the increasingly diverse learners in higher education, it is critical that faculty create learning environments and learning activities to address different learner needs and preferences (e.g., Bonk & Zhang, 2008; Wilson, 2011; Maaliw, 2020). However, limited research has focused on faculty's use of SM in flipped classrooms.

This study adopted Bonk and Zhang's (2006, 2008) framework, Read, Reflect, Display, and Do (R2D2) for online and blended learning, and explored the following questions:

1. What is the state of faculty use of social media (SM) in teaching in Saudi universities?
2. What are Saudi faculty members' attitudes towards using SM in flipped classrooms (FC)? Are there any differences by gender, academic ranking, or teaching experiences in this regard? If so, what are such differences?
3. How do Saudi faculty members use SM as per the R2D2 framework?
4. What factors prevent or limit Saudi faculty's SM uses in FC? Are there any differences by gender, academic ranking, or teaching experiences in this regard? If so, what are such differences?

Related Literature

Social Media

Social media has become increasingly important and ubiquitous for exchanging experiences and knowledge (Asur & Huberman, 2010; Kane & Alavi, 2014; Sibel, 2021), in addition to sharing content, insights, and opinions (Kaplan & Haenlein, 2010; Lewis 2010; Hunter, 2013). Educators and researchers have started to integrate social media in their instructions as well as to create interactive learning environments, and to increase knowledge acquisition (e.g., Gao, Luo, & Zhang, 2012; Tess, 2013; Burbules, 2016).

Flipped Classroom

The flipped classroom (FC) prepares learners for upcoming, traditional, face-to-face learning in advance, from outside of the classroom, by providing them with sufficient knowledge prior to the in-classroom experiences (Keengwe, Onchwari, & Oigara, 2014). FC empowers faculty and learners to use the class meeting more effectively and more time-efficiently, and thus may facilitate more engaging and collaborative activities (Estes, Ingram, & Liu, 2014; Hyung-ji, 2020). Herreid and Schiller (2013) further asserted that FC may combine student-centered active learning with content mastery through its application in the real-life situations (Jamaludin & Osman, 2014). However, there are some challenges that may hinder the adoption of FC in higher education, including the lack of experiences, or lack of access to the right technology (Davies, Dean, & Ball, 2013) for faculty members.

R2D2 Framework (Bonk & Zhang, 2006, 2008)

Bonk and Zhang's R2D2 framework guides faculty and instructional designers to create or choose a wide range of learning activities with appropriate technologies, and to build effective online or blended learning environments (Bonk & Zhang, 2006, 2008). The R2D2 framework also sheds light on how to incorporate emerging technologies, activities, and tasks for diverse generational learners (Zhang & Bonk, 2009, 2010). This framework consists of four categories of learning activities: Reading, Reflecting, Displaying, and Doing, and hence R2D2. It is not linear, which means that learning events and activities do not have to be scheduled in a fixed sequence from reading to doing or otherwise. It has been widely applied in online or blended learning. For example, it was adapted to guide librarians' design efforts of online learning objects in higher education (Lavoie, 2016), and it was fully integrated in an English for Academic Study program at and as a result

improved student performances (Cartner & Hallas, 2009).

Method

Research Design

Sequential mixed-method research was conducted, with a five-section online survey to collect quantitative data concerning the state of faculty use of SM and related attitudes, followed with semi-structured interviews with selected volunteer participants.

Participants

A total of 391 eligible Saudi faculty affiliated with Saudi university (199 male and 192 female) participated in this study, representing all ranks of faculty, including 21 Professor, 42 Associate Professor, 120 Assistant Professor, 133 Instructor, and 75 Teaching assistant. Eight of them, 4 male and 4 female, were selected for individual interviews after the online survey.

Data Collection Instruments

The online survey consisted of five sections. The first section focused on demographics, included questions about age, gender, number of years teaching in higher education, major, and academic rank. The second section included 7 question items (see Table 3). The third section included 8 question items (see Table 5). The fourth section included 16 items, with four items in each of the four R2D2 categories (see Tables 6, 7, 8, and 9). Finally, the fifth part explored factors that may have prevented or limited Saudi faculty's use of SM in FC, with 7 items (see Table 10). The follow up interviews included eight open-ended questions. Table 1 summarizes the interview questions by specific research focus in this study.

Table 1. Interview Questions by Specific Research Focus

Research focus	Interview Questions
1. Experiences in using social media	1. How do you use social media in your teaching practices with students? Provide examples. 2. Which types of social media did you use in your teaching? Provide example. Why did you use them?
2. Faculty members' attitudes towards using social media in flipped classrooms	3. How do you see the role of using social media as a flipped classroom tool in the teaching process? Why? 4. In what ways does the use of social media as a flipped classroom play a significant role in enhancing the educational process?
3. The factors that prevent or limit Saudi faculty's social media uses in flipped classrooms	5. What, if any, factors prevent or limit your use of social media as a flipped classroom in teaching practices? Why? 6. What do you think the factors are that prevent or limit other faculty members from using social media as a flipped classroom in Saudi universities? 7. How do you see the effect of universities, faculty members or students on the use of social media as a flipped classroom in Saudi universities? Why? 8. What are some of the motivators that encourage faculty member like yourself (in Saudi universities) to use social media as a flipped classroom in teaching practices? Why?

Validity and Reliability of Instruments

In this study, establishing content validity began with a thorough review of the literature to ensure the questionnaire reflected a relevant and complete set of items. Additionally, the questionnaire and interview protocol were sent to a number of experts in instructional technology field in order to measure content validity and face validity. Similarly, the pilot study was conducted to measure the internal consistency and reliability of the questionnaire through sending the questionnaire to a number of faculty members affiliated with Saudi universities. Cronbach's alpha was used to measure the reliability and internal consistency of this questionnaire (see Table 2).

Table 2. Reliability of Instrument

Variables	N of Items	Cronbach's Alpha (α)
Faculty Members' Experiences in Using Social Media in Teaching	7	0.81
Faculty Members' Attitudes Towards Using Social Media as a Flipped Classroom tool in the Teaching Process	8	0.98
Learning Activities in Each Category of R2D2 Model	16	0.86
Factors which Prevent or Limit Saudi Faculty's Social Media Uses in Flipped Classrooms	7	0.89

Data Collection Procedure

With IRB approval, the online survey was published on Qualtrics. Invitations to participate and the online survey link were widely distributed via a variety of social networking sites to recruit eligible participants. They were also sent out from the official accounts of Deans of Graduate Studies in Saudi universities. The first author also reached out directly through personal communications with prospective participants and spread the invitation to participate via WhatsApp, email, and many other social media tools. Furthermore, volunteers for interviews were selected to participate in the interviews with representatives from both genders and from all different academic ranks. The researchers used personal communication with some faculty members in Saudi universities to recruit interviewees.

Results

Research Question 1: What is the state of faculty use of social media (SM) in teaching?

The overall median for all items of faculty members' use of SM in teaching was 2.86, close to "Sometimes". This means that social media were occasionally employed by faculty members in teaching, and the majority of these faculty members had used SM in teaching (see Table 3).

Table 3. Faculty Use of SM in Teaching

	Use of SM in teaching	The descriptive statistics			
		Mean	Median	Mode	SD
1.	I use Social media (e.g. Twitter, Facebook, Instagram) in communication with my students.	2.93	3	1	1.43
2.	I ask my students to submit assignments through social media (e.g. Twitter, Facebook, Instagram).	2.19	2	1	1.36
3.	I direct my students to share experience with each other through social media.	3.01	3	3	1.38
4.	I use social media as a resource for exchanging knowledge with my students.	3.01	3	3	1.31
5.	I show my personal research interests through a public profile on social media.	3.20	3	4	1.31
6.	I form student groups to collaborate with each other through social media (e.g. Google Hangouts, Discussion Board).	2.69	3	3	1.31
7.	I use social media to reach conferences or other classrooms.	2.85	3	1	1.40
	Average	2.84	2.86	2.28	1.36

Kruskal-Wallis H Test was used to test the significant differences by professional ranking, because assumptions of normality and homogeneity were not met in the data for this question. There were statistically significant differences by academic ranks. Tukey's test revealed that assistant professors and associate professors were the most frequent users of social media in teaching.

Furthermore, Mann-Whitney U Tests were conducted, because the data were not normally distributed, and there were no statistically significant differences between male and female in faculty's SM use.
Interviewees used different social media in their teaching practices with students, as summarized in Table 4.

Table 4. Summary of Social Media Used by Interviewees

Interviewee	social media	Use social media for	Why you choose the particular social media
# 1	Twitter	In personal life, not in instructions	"It is the most widely used and easy to deal with it."
# 2	Twitter, Snapchat, WhatsApp	inform students about changes that in the course plan and remind them the time of the lecture	"They are easy to use and more reliable than others, and the content could be edited or modified on them."
# 3	Twitter, WhatsApp, Email, and Facebook	for creating groups and including some course content and giving students a chance to discuss this content. He	"They are most applications to be receptive by students. They can be activated and used easily by Smartphone."

		mentioned that the content had been set on social media after the main lecture.	
Interviewee # 4	WhatsApp and Blackboard	for sending some alerts regarding the time of the lectures or any changes that should be known before the lecture.	"Because students have the ability to use them easily. Blackboard is also the official educational platform that is accessible through the university website."
Interviewee # 5	Telegram, Twitter, and WhatsApp	provide content to students with a number of images and links so that they could discuss it with each other.	"Because the student experience in them is more. Also, when applications are most private, they are more acceptable among female students in Saudi society."
Interviewee # 6	WhatsApp, and Blackboard	for creating groups for the course and provide students with important information related to the course	"WhatsApp is easy and present with students in anywhere and anytime. They can receive responses on time. Blackboard is a good place for discussion and submitting assignments."
Interviewee # 7	WhatsApp	create groups and provide students with everything new in their field.	"It is easy to be used by students and me, and is widely common among most students."
Interviewee # 8	Twitter	communicate with students, discuss topics related to the course, and share educational resources.	"It is the easiest and most popular in society."

Overall, the interviews indicated that there were a number of social media used by faculty members in Saudi universities in teaching practices. The majority of these applications were used for exchanging knowledge, responding to students' questions, and creating groups for discussions.

Research Question 2: What are Saudi faculty members' attitudes towards using SM in flipped classrooms (FC)? Are there any differences by gender, academic ranking, or teaching experiences? in this regard? If so, what are such differences?

The descriptive statistics showed faculty were positive towards using SM in FC in general, as "Strongly agree" and "Agree" were most frequently reported for all attitude statements, while "Disagree" and "Strongly disagree" were among the lowest (see Table 5).

Table 5. Faculty's Attitudes towards SM use in FC

	Faculty's attitudes towards SM use in FC	The descriptive statistics			
		Mean	Median	Mode	SD
1.	I think that social media is useful in implementing a flipped classroom.	3.96	4	4	0.88
2.	I think that students' uses of social media in higher education have a significant role in enhancing a flipped classroom.	3.93	4	4	0.91
3.	I think that using social media in a flipped classroom generates communication between faculty members and students.	4.07	4	4	0.85
4.	I think that using social media in a flipped classroom creates interactive learning environments.	4.03	4	4	0.83
5.	I think that using social media in a flipped classroom eliminates fear and anxiety of discussions that might be in a traditional classroom.	3.96	4	4	0.87
6.	When I use social media in a flipped classroom, I address diverse learner preferences and desires.	3.83	4	4	0.90
7.	I think that using social media in a flipped classroom helps me provide feedback to students anytime and anywhere.	4.08	4	4	0.87
8.	I think that using social media in a flipped classroom delivers the content in multiple forms (e.g. images, videos, audio, etc.).	4.19	4	4	0.86
	Average	4	4	4	0.87

Mann-Whitney U Test was conducted to test if there were any significant differences between less experienced (1-6 years, n= 200) and more experienced faculty members (7 years or more, n= 191) in SM use in FC. No statistically significant differences were found. Similarly, Mann-Whitney U Test results also showed no significant differences by gender.

The interviewees were asked about the role of using social media as a flipped classroom tool in the teaching process and in what ways the use of social media as a flipped classroom play an important role to enhance the educational process. All interviewees without exception asserted that the use of social media as a flipped classroom plays a positive role in improving and enhancing education, because the students cannot discover only through discussion and because the traditional method in the classroom transforms the student into a repository of information that increases and decreases by the amount of information provided by the teacher in the lecture (Interviewee #1). Furthermore, employing the flipped classroom with the use of social media help the students to express their points of view and to overcome the fear of making mistakes in front of colleagues (Interviewee #2); deliver the content to the learner in multiple forms, such as video, pictures or discussions, which in turn serve a large number of learners because it takes into account the diversity of learners according to their desires in the way of learning (Interviewee #3); and allow the student to research, discuss, and have respect for others (Interviewee #4). In addition, Interviewee #5 asserted that the use of social media as a flipped classroom tool is very effective way because students are in constant contact with the teacher and the content is available at any time. She stressed that social media increase their effectiveness as a flipped classroom tool

whenever the content is presented in multiple formats. This is consisting with what mentioned Interviewee #6 that social media are usually easy and available to students, so the use of social media in educational process whether as a flipped classroom or with other instructional strategies will play an important role to enhance learning. Interviewee #7 stressed the importance of the use of social media as a flipped classroom tool through providing students with the content before the lecture in more attractive ways and saves time during the lecture, which may be wasted on the basic things. She stated that the lecture time may not be enough for students to master all the skills required, so providing the students the content before the lecture gives students a chance to review and prepare for the lecture. Also, she mentioned that the use of technology, especially social media, as a flipped classroom tool allows the student to present content to their colleagues. Interviewee #8 did not differ from other interviewees in her opinion about the use of social media as a flipped classroom. She asserted that the use of social media as a flipped classroom tool is effective in preparing students for upcoming lectures through providing them with different instructional resources in multiple formats (e.g. videos, links). Also, she focused on the diversity of technology and activities that should be used when employing social media as flipped classroom (e.g. images, videos, and discussions). Generally, the interviews confirmed that faculty members in Saudi universities have positive attitudes towards social media in flipped classrooms. In addition, the interviews revealed the diversity of technology and various uses of social media in flipped classrooms.

Research Question 3: How do Saudi faculty members use SM as per the R2D2 framework?

Statistically significant differences were found in how faculty members used SM in FC as per the R2D2 framework. For example, in “Read” category of learning activities, "often" was most frequently reported for all 4 “Read” items. While "never" was most frequently reported for all items in the “Do” category, as well as the three items in “Reflect” and “Display” categories. This indicates that Saudi faculty, in their use of SM in FC focused largely on reading type of activities, then followed by reflecting and displaying activities, and lastly the doing or hands-on activities. These findings were consistent with the descriptive statistics in Table 6, 7, 8 and 9.

Table 6. Activities of Reading Category of the R2D2 Model

	Items	The descriptive statistics			
		Mean	Median	Mode	SD
1.	Providing students with some online reading materials related to content of lecture	3.49	4	4	1.15
2.	Providing students with audio materials related to content of lecture	3.11	3	4	1.19
3.	Creating online chats including some questions and answers related to the content of the lecture among students (i.e. each other) and with the instructor	2.99	3	4	1.27
4.	Assigning students to find and read a certain number of articles related to the topic of the lecture	3.37	4	4	1.17
	Average	3.24	3.5	4	1.19

Table 7. Activities of Reflecting Category of the R2D2 Model

	Items	The descriptive statistics			
		Mean	Median	Mode	SD
1.	Asking the students to discuss with each other in online discussion forums including some content related to the topic of the lecture	3.01	3	4	1.23
2.	Creating online blogs and asking students to post their reflections about their readings or observations related to the topic of the lecture	2.66	3	3	1.30
3.	Creating social networking links (e.g. YouTube, Twitter, Facebook) and asking the students to post their discussions and reflections about the content related to topic of lecture	2.63	3	1	1.32
4.	Posting of online case studies related to the topic of the lecture to the Web and asking students to add their analysis and reflections about that	2.50	2	1	1.25
	Average	2.7	2.75	2.25	1.27

Table 8. Activities of Displaying Category of the R2D2 Model

	Items	The descriptive statistics			
		Mean	Median	Mode	SD
1.	Creating instructional video that includes the content related to the lecture and posting it on a YouTube	2.63	3	1	1.37
2.	Asking students to watch online conferences or events related to the topic of the lecture	2.81	3	3	1.32
3.	Creating virtual field trips corresponding to the content of the lecture and asking students to view them	2.03	2	1	1.20
4.	Providing students with figures or charts related to the lecture content	3.14	3	4	1.27
	Average	2.65	2.75	2.25	1.29

Table 9. Activities of Doing category of the R2D2 Model

	Items	The descriptive statistics			
		Mean	Median	Mode	SD
1.	Providing students with some Scenarios by using video relates to the topic of the lecture and includes some challenges for learners	2.54	2	1	1.39
2.	Providing students with online tutoring and mentoring that help them to interpret and respond to questions related to the topic of the lecture	2.37	2	1	1.30
3.	Providing students with online simulation games used to explain concepts and principles related to the content of the lecture.	2.03	2	1	1.24
4.	Using online site and asking the students to add summaries or comments related to the content of the lecture	2.50	3	1	1.26
	Average	2.36	2.25	1	1.29

One Way repeated measures ANOVA was employed to examine faculty use of SM as a flipped classroom tool as per the R2D2 framework in Saudi universities. Statistically significant differences were found between all 4 categories of learning activities per the R2D2 framework. As illustrated in Figure 1, the reading category had the most activities used by Saudi faculty, followed by reflecting, displaying, and doing categories, respectively.

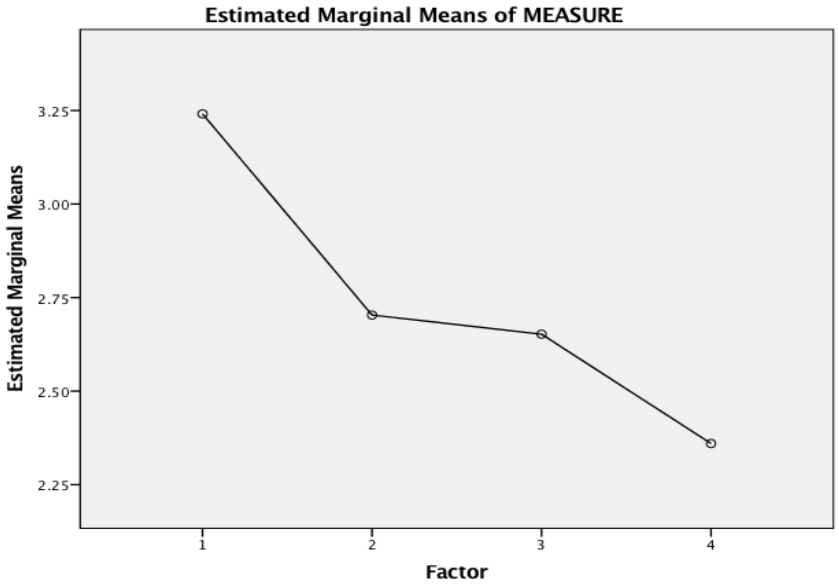

Figure 1. Comparisons Among the R2D2 Categories (Note: (1) Reading; (2), Reflecting; (3) Displaying; (4) Doing).

Research Question 4: What factors prevent or limit Saudi faculty's SM uses in FC? Are there any differences by gender, academic ranking, or teaching experiences in this regard? If so, what are such differences?

The survey results indicated a number of factors that prevented or limited faculty use of SM as a flipped classroom tool in their teaching (see Table 10).

Table 10. Factors Limiting Faculty Use of SM in FC

	Items	The descriptive statistics			
		Mean	Median	Mode	SD
1.	Inability to manage social media prevents or limits me from using it as a flipped classroom tool in my teaching.	3.31	4	4	1.19
2.	The required time for preparing a flipped classroom by using social media prevents or limits me from using it as a flipped classroom tool in my teaching.	3.65	4	4	1.04
3.	Lack of adequate experience in creating a flipped classroom by using social media prevents or limits me from using it as a flipped classroom tool in my teaching.	3.60	4	4	1.15
4.	Lack of incentives or rewards for using diverse social media	3.04	3	4	1.20

	prevents or limits me from using it as a flipped classroom tool in my teaching.				
5.	Lack of Internet accessibility to materials prevents or limits me from transforming a traditional classroom to a flipped classroom by using of social media.	3.41	4	4	1.23
6.	Lack of technological skills of students prevents or limits me from adopting the diverse social media as a flipped classroom tool in my teaching.	2.86	3	2	1.26
7.	The high cost of technological tools used in a flipped classroom prevents or limits me from adopting social media as a flipped classroom tool.	2.87	3	2	1.24
	Average	3.25	3.57	3.43	1.18

T-test results indicated no differences by gender in factors that limit the use of social media as a flipped classroom tool.

Table 11 summarizes the interview data with factors that prevent or limit faculty members in Saudi universities from using social media as a flipped classroom tool. The majority of these factors focused on the weak infrastructure of Saudi universities and lack of necessary resources (e.g. computers and access to the Internet, especially for students), misperception about the role of flipped classroom, and reluctance of faculty members to stop teaching with traditional methods and to employ technology and modern methods in their teaching practices. These factors were rated consistently high in the descriptive statistics results of the survey in this study for factors that prevent or limit faculty members in Saudi universities in using social media as a flipped classroom tool, and that focused highly on the weakness of the role of universities and faculty members.

More importantly, interviewees shared critical insights on why and how some of these factors have prevented or limited faculty from using SM in FC. For example, many female students did not desire to participate in groups on social media (e.g. Twitter and Facebook). This is partially due to the shared negative view on social media in Saudi society. Also, faculty reported that they may have to invest on their own to provide resources and equipment in order to use SM in FC. It was also noted that in many universities students were not granted access to the university's Internet, which has then tremendously limited the ways to integrate SM in FC in Saudi.

Table 11. Factors Preventing or Limiting Saudi Faculty's Social Media Uses in Flipped Classrooms

Factors	Interviewees							
	1	2	3	4	5	6	7	8
1. Society's view towards the passive role of social media	X				X			
2. Lack of experience on how to employ social media in educational purposes	X							X
3. The misperception about the flipped classroom								

so that is believed that flipped classroom eliminates the traditional classroom, it is a waste of time, or it cannot be used in all disciplines.	X	X		X	X			
4. The reluctance of the faculty members to get rid of teaching by using traditional methods, and to employ technology and modern methods in their teaching practices.		X	X			X		
5. The successful flipped classroom needs a highly experienced teacher, and this may not be available in many faculty members.			X					
6. Students' inability to use social media as a flipped classroom tool				X				
7. Weak infrastructure in Saudi universities and the lack of the necessary resources (e.g. computers and access to the Internet, especially students) to employ modern educational methods		X	X	X	X		X	X
8. Some departments in Saudi universities are not convinced of the idea of distance learning					X		X	
9. Lack of workshops and training courses for faculty members about the use of technology in education	X							X

More specifically, interviewees shared their experiences as well as critical reflections upon the factors preventing Saudi faulty from using SM in FC. They highlighted that universities did not encourage or facilitate the application of technologies in teaching. They voiced concerns while some Saudi universities encouraged faculty members to employ technologies for teaching in rhetoric, the specific policies, rules and regulations do not promote or facilitate such practices.

Interviewees consistently stressed that the role of universities and faculty members was weak in the use of social media, especially in Saudi government universities, but in e-universities there is a definite role because distance education and e-learning are activated. Interviewees also shared suggestions to motivate faculty members to SM as a FC tool in teaching practices.

- Adopting modern educational methods, as well as learning technologies in Saudi universities as a development project
- Provide training courses and workshops to clarify some of the effective ways in which technologies are used, especially social media
- Providing the students and faculty members with the necessary equipment and granting students access to the Internet on campus
- Creating a collaborative learning environment within the classroom and building a strong relationship between students and faculty outside the classroom to promote FC activities

- Financial incentives: Historically, there was a financial reward for faculty members in Saudi universities called "Computer reward", equal 20% of the base salary of the faculty member. This reward had encouraged faculty members to use technology in their teaching, but when this bonus was stopped, some faculty members including those who had been using it before no longer used technology in their teaching.

Discussion

This mixed-method study found that faculty in Saudi universities had varied levels experiences in using SM in FC. Most often, they used SM to share knowledge, resources and experiences with students, and to promote their own professional profile on SM. Participants reported a number of SM apps, such as Twitter, Snapchat, WhatsApp, Facebook, Blackboard, and Telegram. Participants in this study demonstrated positive attitudes towards using SM in FC. There were significant differences between academic ranks in a number of variables related to faculty experiences in using SM in teaching. Despite research indicating gender differences in SM uses (e.g., Anduwa-Ogiegbaen & Isah, 2005; Zhou & Xu, 2007; Kim & Yoo, 2016), this study found no significant differences between male and female in their experiences in using SM in teaching, which was consistent with an earlier study in Saudi (i.e., Aifan, 2015), but this differs about another study carried out by Baki and Yesim (2020) that mentioned "... the participants' attitudes towards social media varied by only gender and faculty" (p. 287).

In summary, there were significant differences among academic ranks (i.e., professor, associate professors, assistant professors, instructors, and teaching assistant) regarding faculty members' experiences in using SM in teaching, and no significant differences between male and female in this regard. In addition, there were no significant differences between less experienced and more experienced faculty members regarding their attitudes towards using SM as an FC tool. Likewise, there were no significant differences between male and female regarding factors preventing or limiting Saudi faculty's social media uses in flipped classrooms, or in their attitudes towards using SM in FC.

There were a number of factors which prevented or limited faculty in Saudi universities from using SM as an FC tool. Highlighted were the (a) lack of motivation to adapt the new ways of teaching and learning, using new technologies (Greener, 2015; Aboraya & Alket, 2016; Ibrahim & Gulsah, 2020) at the organizational level as well as individual level, (b) the limited Internet accessibility for students (Davies, Dean & Ball, 2013), and (c) faculty's lacking of technological and pedagogical skills necessary for using SM in FC. The study has many practical implications. For university leadership and policy makers, the study clearly indicates more systematic support and incentives are necessary at the university level to encourage and empower faculty to use SM as an FC tool. Faculty development on innovative pedagogy as well as technical support would also be essential for faculty to effectively integrate SM in their teaching in FC. Faculty would benefit from mindful adoption of frameworks such as Bonk and Zhang's R2D2 to strategically choose from a wide range of learning activities using SM in FC.

The study evidently showed that faculty's uses of SM in FC were rather preliminary, and mostly limited to reading type of learning activities as per the R2D2 framework (Bonk & Zhang, 2006, 2008). How to promote and facilitate faculty's applications of SM in other learning activities, like reflecting, displaying and doing, would be worthy of further studies. A number of factors have limited or prevented faculty from using SM in FC, such as weak technical infrastructure, lack of access to the Internet, and more. Faculty's lacking of necessary pedagogical and technical skills stood out as the most prevalent challenge. Future research may explore in more detail on faculty's knowledge, skills, as well as experiences in using SM in varied learning activities, esp. for reflecting, displaying and doing, as per R2D2 framework (Bonk & Zhang, 2006, 2008). Also, Saudi students, especially female students may be reluctant to use SM due to the negative societal views on SM in Saudi culture. Thus, future research is highly recommended to further examine cultural impacts on students' experiences in using SM in FC, including gender differences in Saudi and similar cultural contexts.

Conclusion

The findings of the study showed that faculty members in Saudi universities have some experiences in using social media in teaching, and the most of these uses were for the purposes of exchanging knowledge, response to students' questions, and creating groups to help students discuss with each other. Also, there were various types of social media used by the faculty members, such as Twitter, Snapchat, WhatsApp, Telegram, and Blackboard. There were significant differences among academic ranks (i.e., professor, associate professors, assistant professors, instructors, and teaching assistant) regarding faculty members' experiences in using social media in teaching, and no significant differences between male and female in this regard. In addition, there were not significant differences between less experienced and more experienced faculty members regarding their attitudes towards using social media as a flipped classroom. Moreover, there were not significant differences between male and female regarding factors preventing or limiting Saudi faculty's social media uses in flipped classrooms, as well their attitudes towards using social media as a flipped classroom. Although the study showed that faculty members have a positive tendency towards using social media in flipped classrooms, students' learning preferences did not receive faculty members' sufficient attention. This may be due to many factors that prevented or limited the faculty members from using social media as a flipped classroom tool such as, weak infrastructure and the lack of access to the Internet, and lack of workshops and training courses that help faculty members use technology in education.

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Author Information

Majed Alharthi, Ph.D
https://orcid.org/0000-0003-3705-5171
University of Jeddah
6420 University of Jeddah Road, P.O. Box 13151
Jeddah 21493
Saudi Arabia
Contact e-mail: *malharthy@uj.edu.sa*

Ke Zhang, Ph.D.
https://orcid.org/0000-0002-4690-7586
Wayne State University
5425 Gullen Mall, Detroit, MI 48202, USA
USA