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A Case Study Exploring Junior High School Students' Interaction Behavior in a Learning Community on Facebook: Day and Time

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Abstract. Because Facebook has become another site where students spend much of their time, more and more teachers and researchers conduct teaching activities on Facebook. As a result, teachers must understand the students' interaction behaviors in Facebook groups before creating a learning community on Facebook. This research aimed to explore teachers' posts, students' posts and student's responses (read, like, and reply) to posts. The results showed that students preferred to reply to teachers' posts instead of students' posts. Students participated in online interactions mostly at night, before weekends and between 8:00 pm and midnight on school nights. Thus, it is recommended that teachers be aware of students' online interaction behaviors so they can arrange appropriate schedules and actively post articles to allow student discussion.

Keywords: Learning community; Facebook, Interaction behavior

1. Research Background, Motivation and Purpose

With the onset of the digital era and the maturing of the Internet, the online social community has been increasing. The online social community is derived from the concept of clubs in real society. Netizens can establish various clubs through community websites to connect and communicate with each other (Zhong, Salehi, Shah, Cobzarenco, Sastry, & Cha, 2014: Tsovaltzi, Puhl, Judele, & Weinberger, 2014; Albayrak, & Yildirim, 2015). In such cyberspaces, people can interact to share information with each other. So far, Facebook has been one of the most popular Social Network Services in the world (Barbera, 2009; Madge, Meek, Wellens, & Hooley, 2009).

The trend of social communities has also changed the learning environment. For example, teaching innovations in recent years have flipped teaching, Massive Open Online Courses (MOOCs) have been instituted, etc. The trend has created learning tools that are not restricted to books. Because the social community has become a new site of learning, many teachers have currently adopted Facebook as a learning community (Aydin, 2012). Teachers can use Facebook groups to

design teaching content, guide students through Questions and Answers (Q&As), or even complete learning tasks through cooperative learning. On such platforms, teachers and students may interact to discuss interesting questions with each other. Thus, students can explore knowledge in the learning environments that teachers have built, and teachers may reflect on their teaching based on students' feedback (Wu, Hou, Hwang, & Liu, 2013; Wang & Hou, 2014; Hartnett, Rosielle, & Lindley, 2015).

According to relevant studies, Facebook Groups have become a type of new learning site. Facebook Groups can be used as a tool for mutual exchanges, learning, and communication between teachers and students and among students (Aydin, 2012). In the findings of Mazman and Usluel (2010), because students usually use Facebook to interact with people, they will feel more comfortable participating in the informal and highly interactive learning environment on Facebook, where teaching and learning can be integrated. Hou, Wang, Lin, and Chang (2013) compared the online discussions set up on Facebook clubs and on regular learning platforms. The results showed that Facebook could enhance students' social interactions and emotional exchanges. As a result, the discussion area on community websites (such as Facebook Groups) will increase their influence on learning outcomes. Since Facebook became a new site of learning communities, few studies have explored how to manage learning communities on Facebook. For example, McCarthy (2013) indicated that teachers should pay attention to privacy issues and clearly guide students to participate in learning activities on a Facebook Group. Moreover, teachers may try to combine many actual teaching activities with online activities as much as possible.

According to the above-mentioned works, there was demand for applying learning communities on Facebook to classroom teaching, and this application has shown some effects. However, the learning communities are student-oriented and could not function if no members interacted. As a result, it is very important to know how teachers conduct the learning communities on Facebook and guide students to interact with each other (Whittaker, Howarth, & Lymn, 2014; Sharma, Goodwin, & Wilkinson, 2014; Chang 2014). To increase interactions in the community, teachers should thoroughly understand students' interaction behaviors (such as posts, replies, liking, and reading). Therefore, it is worth exploring whether certain days of the week or certain periods in the day would influence students' interactions because such knowledge would help teachers determine a proper timing for posting articles and terminating activities. In the past, it was the teachers who led the online learning communities; however, as the social-networking interaction increases, it is also worth exploring whether the interactions in learning communities would change, namely, whether students' responses to teachers' posts and those to students' posts differ.

In summary, through exploring the learning community on Facebook Groups, which was founded by teachers for students to participate in learning activities in their spare time, this research could investigate teachers' posts, students' posts, and students' responses (reading, liking, and replying) to posts; we further analysed these data, conducted interviews based on the results, and

finally proposed relevant suggestions. The study questions were proposed as follows:

1. Are students' responses (reading, liking, and replying) influenced by whether a post was written by a teacher or another student?
2. On which day would students participate in learning interactions more frequently?
3. At what time would students interact in the learning community most?

2. Research Design

2.1 Experimental Design and Procedures

To address the research questions, the research included a 30-day teaching activity. Based on the research structure, teachers posted one article every day during these 30 days and encouraged the students to reply as well. After this teaching activity terminated, the statistics of the number of students' posts and the responses to teachers' and students' posts (reads, likes, and replies) were gathered, in addition to information about which days and times the behaviors took place (see Figure 1).

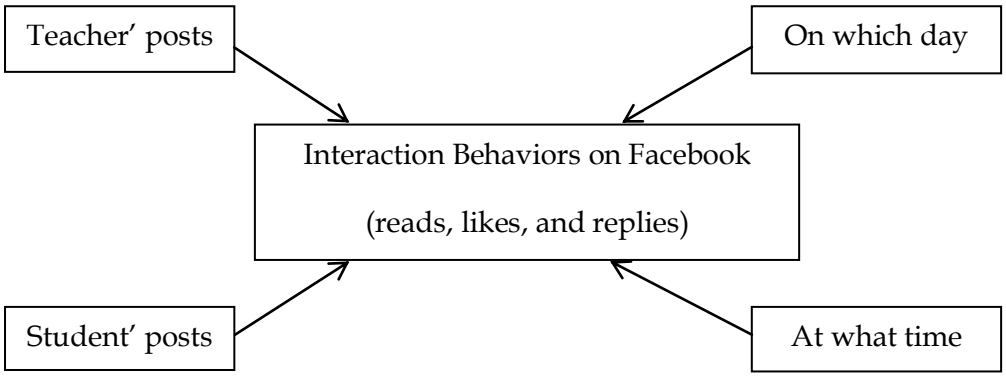

Figure 1. Research Framework

According to the research framework, the detailed procedures were as follows:

1. Using a Facebook Group as a learning platform, teachers built a class club and invited all students to join the club.
2. In accordance with class schedules, teachers divided posts of a Natural Science unit on Light into 6 parts, including the curricular announcement, highlights, online practice, experimental videos, supplementary materials, and information sharing. Teachers posted an article at 17:00 every day and asked students to learn and discuss with each other in their spare time.
3. The club was not open to the public. The content was open to only members of the club. When teachers posted the curriculum to the club's Wall, students could use like and reply functions provided by Facebook Groups to respond. Students could also post content, including text, videos, and pictures, to the Wall of the club and interact with their classmates.

4. During this experiment, the teachers were not involved in the students' discussions or sharing. The students could discuss and share things with each other based on their actual situations in their spare time. After this experimental curriculum ended, the teachers gathered statistics about the students' feedback, the number of likes and the number of replies.
5. Last, we analysed the statistics gathered, conducted interviews, and finally drew conclusions and proposed suggestions.

2.2 Participants

The participants of the research were junior high school students in Grade 9 in Taiwan. The class was comprised of 31 students. Because the experiment was an after-school teaching activity, the number of students actually participating in this activity was 28, with 12 males and 16 females, excluding the students without the approval of their parents and those without personal Facebook accounts.

2.3 Instruments and Data Analysis

Because Facebook is currently the social networking site regularly used by students, the research adopted a Facebook Group as an online interactive platform. After the one-month case study, Nvivo and NCapture were used to download all of the data from the Facebook Group. After the data were downloaded, the descriptive statistics and analyses were conducted by calculating the sums, averages, and percentages.

3. Results and Discussion

3.1 Teachers' Posts vs. Students' Posts

This section addresses Question 1. According to Table 1, the number of teachers' posts was 30, and the number of students' posts was 56. The number of students who liked the teachers' posts was 10% greater than that of students who liked other students' posts; the number of students who replied to teachers' posts was also 32% greater than that of students replying to other students' posts. In terms of posts, the number of students who read the teachers' posts and that of students who read other students' posts were almost the same; that is, each student read almost every article posted, whether by teachers or students.

Table 1. Interactive frequency of teachers' posts and students' posts

	Post (N)	Like			Read			Replay		
		Total	Average	%	Total	Average	%	Total	Average	%
Teacher	30	585	19.50	55.0	916	30.53	50.2	244	8.13	65.8
Student	56	893	15.95	45.0	1697	30.30	49.8	237	4.23	34.2

The results showed that students preferred to reply to the teachers' posts and felt more interested in the teachers' posts. Based on the interviews, students indicated that the teachers' posts were more systematic; thus, they trusted them more, paid more attention to them, and further raised relevant questions to discuss and share with their classmates. Thus, the students held positive opinions about the application of Facebook as a learning community, and the

teachers' posts had a greater influence on the students' responses than the students' posts.

3.2 On which day did students participate in interactions?

As demonstrated in the previous section, the students held positive attitudes toward Facebook being adopted as a learning platform and interacted with each other well. Then, on which day should the teachers post their articles for the students to better participate in discussions and interactions? This section explores Question 2.

In general, people may think that junior high school students have more time on the weekends to participate in online after-school discussions and interactions, which is mainly because the students may be able to spend more time surfing the internet on weekends. Table 2 shows the number of posts and responses each week in this class. According to Table 2, students posted most of the articles and replied to the most posts on Fridays, followed by Tuesdays. This result was inconsistent with the expectation. To understand this finding, one should further understand the students' lifestyles and habits. According to the interviews, the reason that students participated in the online discussions and interactions on Fridays and Tuesdays was because they did not have to participate in after-class tutoring or go to cram schools (namely, additional learning activities after the regular curriculum) and thus had relatively more time. Moreover, because Friday was the last day for school for the week, the students did not have to go to school the day after and felt relaxed enough to surf the internet. Additionally, some parents restricted their children from surfing the internet, but they usually allowed them to go online near the weekends; hence, the chance of going online on Fridays increased significantly.

Table 2. Number of posts and responses each week

	Mon		Tue		Wed		Thu		Fri		Sat		Sun	
Teacher's posts	5		5		4		4		5		5		5	
Student's action	Post	Replay	Post	Replay	Post	Replay	Post	Replay	Post	Replay	Post	Replay	Post	Replay
Students' response/day	2	53	17	67	3	41	5	57	8	104	11	69	10	67
Total	55		84		44		62		112		80		77	

3.3 At what time do students participate in interactions?

Last, this section explores the period in the day during which students participate in discussions and interactions and thus addresses Question 3. Figure 2 shows the statistics on the number of student interactions in the Facebook Group each hour of the day. According to Figure 2, most of the students interacted in the learning community after 5 pm and between 8 pm and 12 pm,

especially from 10 pm to 11 pm. Because the school day ended at 5 pm, some students could go online and interact in the learning community soon after school, whereas other students had to do housework, homework, and after-school tutoring, etc., and participated in their interactions later, after 8 pm and especially after 10 pm. Thus, if teachers could consider such situations to determine the right time to post articles while using a learning community on Facebook to teach, they could encourage the best interactions between the students.

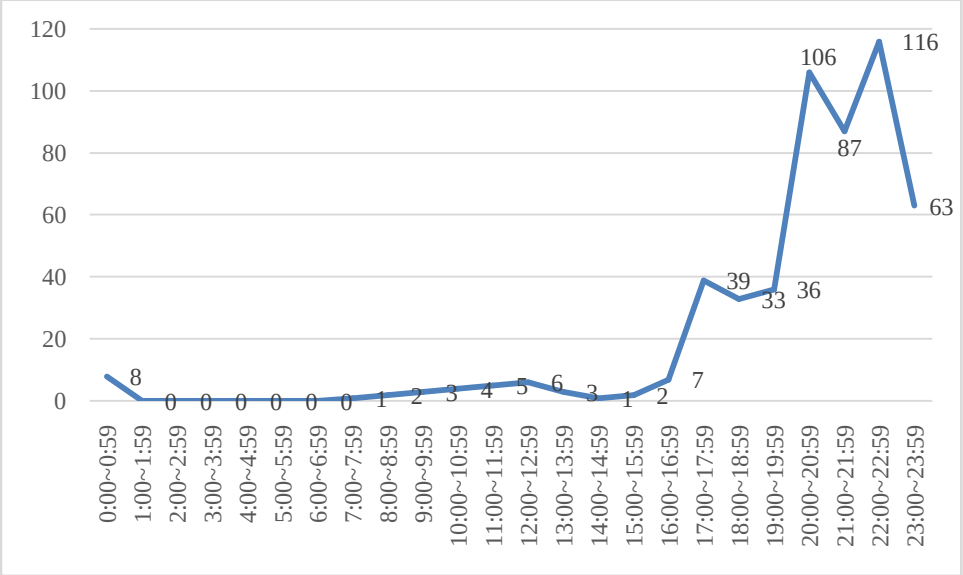

Figure 2. Total number of students' responses each hour

4. Conclusions and Suggestions

This study focused on a learning community on Facebook, which was adopted by teachers as a learning platform for students to engage with the curriculum in their spare time to explore the students' interaction behaviors on the social networking site. According to the analysis of three research questions and subsequent interviews, we found first that the teachers' posts had a greater influence on the students' responses (reading, liking, and replying) than the students' posts. Second, the students participated in learning interactions on Fridays more frequently than on the other days. However, such a result may be subject to the family factors and lifestyles of the students, and the frequency of going online every day may differ as well. Last, most of the students started to interact in the learning community from 8 pm to midnight. Moreover, in the interviews conducted by the researcher, it was revealed that the students thought that it was quite feasible to apply a learning community on Facebook to after-school tutoring, which could help them extend their learning activities and further enhance their learning efficiency. As a result, teachers must change from their traditional teaching methods to a more student-based teaching. A learning community on Facebook has become a new classroom for teachers and students.

Teachers should have the courage to apply it to their teaching (Staines & Lauchs, 2013).

To conclude, this study proposed relevant suggestions, which we hope are taken into account by teachers and students while using learning community websites. First, teachers should properly apply a learning community on Facebook and post most of the articles, which can be supported by the students' posts. Moreover, teachers should post the materials at the most appropriate time for the students' lifestyles. Second, because this was only one case study, the conclusions should be considered in the context of junior high school students in each county. Thus, it is recommended that teachers, while conducting such learning activities in the future, adjust their posts based on the students' interaction behaviors and times and pay attention to whether the duration of the posts and expected time for termination are enough for students to participate in online discussions and interactions.

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