The Effectiveness of using Twitter Application in Teaching Pedagogy: A Meta-synthesis Study

Hairul Faiezi Bin Lokman, Nurfaradilla Binti Mohamad Nasri & Fariza Binti Khalid
Universiti Kebangsaan Malaysia, Malaysia

Abstract
In the new era of the borderless world, the development of pedagogical learning is growing and expanding progressively. Educators have diversified teaching methods to create interactive learning experiences. Twitter application is part of a social media network that is used by people every day. In the education world itself, Twitter application has been widely used in teaching pedagogy. Thus, this study is conducted to examine the effectiveness of using Twitter application in the teaching and learning process at low to high education level. Using a meta-synthesis study, 9 articles from 2012 until 2017 were selected. The findings are presented through themes derived from the synthesis of selected articles to elucidate the objectives of the study. Through the synthesis of articles that have been done, the Twitter application has given a good impact in the teaching and learning process. It has been able to increase the learning motivation and facilitate the understanding of a learning process. In addition, it can also create collaborative learning as well as create interaction within a learning process as students can generate ideas from the information sources that are easily accessible in this app. As a result, Twitter application has facilitated the management process of teaching to educators as well as helping to improve student academic achievement.
Keywords: Pedagogy, Twitter Application, Meta Synthesis

Introduction
Information technology has become the basis in the development of pedagogical learning in the 21st century (Yolanda & Marcelle, 2018). The development of the use of information technology can be seen through various methods and learning styles that are diversified to students starting from low to upper level (Mariona & Moises, 2018). Among the methods employed by educators is the use of social media as a tool in assisting the teaching and learning process (Lokman, Yasin & Khalid, 2018).

The use of social media such as Twitter, Facebook, Instagram and many other social media applications have made reference to new pedagogical learning in today's teaching method (Chawinga, 2016). Education curriculum has changed the horizon from teacher-centered to student-centered (Badrul Hisham & Mohd Nasruddin, 2016). The use of Twitter applications in the teaching and learning process has long been practiced (Tur, Marin & Carpenter, 2017) since the Twitter application was introduced in 2006 (Twitter, 2017).

The Twitter application will display online information where the user sends and interacts via "tweet" messages (Twitter, 2017). One of the benefits of Twitter is that anyone can access and view the messages sent if the messages are set as public status without needing a Twitter account. If a message or material posted to Twitter is fascinating, the amount of "tweets" viral will increase through the "reTweet" function which rapidly spread the material (David, 2014).

Purpose and Objective of the Research
This study aims to look at some recent studies on the use of specialized Twitter application in the education field. The objective of the study is to examine the effectiveness of using Twitter application in the development of teaching pedagogy.

Research Methodology
This study applied a meta-synthesis study of several selected articles. Meta-synthesis study can provide extensive information and insights on selected issues (Haas & Springer, 1998). Four article search agents were used, namely Scopus, Ebschost, Jstor and Google Scholar. Article search was done around 2012 until 2017 using three keywords: Twitter, Twitter in education and effectiveness of using Twitter in education. The group of students studied was ranked from low to the highest level of education.

Research Findings
After article screening, there were 43 appropriate articles which related to Twitter application in pedagogical practice. However, only ten articles were suitable to be selected in this study focusing on the research objective. The list of selected articles is as below:

Table 1
List of articles and synthesis reviews

Bil	Author	Title	Year / Country	Synthesis reviews
1.	Shawneen M. Gonzalez, Cynthia C. Gadbury-Amyot	Using Twitter for teaching and learning in an Oral and Maxillofacial Radiology Course	2016 / United States	i. This study was carried out to students of Dental Radiology courses (Maxillofacial Radiology courses) ii. Assisted in increasing oral understanding in Radiology subjects. iii. Twitter became a source of simple and useful learning information and interaction medium
2.	Ilker Yakin & Hasan Tinmaz	Using Twitter as an instructional tool: A case study in higher education	2013 / Turkey	i. This study was conducted in Computer Application course in the Social Science course. Twitter was used to improve learning comprehension ii. Student ideas expanded with Twitter

				iii.	Twitter improved the effectiveness of a learning course
				iv.	Students communicated easily and efficiently with each other while participating in discussion on Twitter about their perspective and experience, and students overcome their fears and became part of the classroom community
3.	Gemma Tur, Victoria I Marin & Jeffrey Carpenter	Use of Twitter in higher education in Spain and the United States	2017 / United States & Spain	i.	Studies were conducted on students of the Degree of Education at University of Spain and United States.
				ii.	Twitter has helped to integrate ideas for courses and gained information about learning through Twitter search agents
				iii.	Twitter was used as a forum medium and easy conversations between students and lecturers
				iv.	Short Twitter format has helped to summarize the main idea
4.	Winner Dominic Chawinga	Teaching and learning 24/7 using Twitter in a university classroom: Experiences from a developing country	2016 / Malawai	i.	Twitter encouraged student-centered learning
				ii.	Students shared and discussed course content and learning beyond classroom hours
				iii.	Students used Twitter by searching, generating and sharing learning content and creating mutual knowledge
5.	Chris Evans	Twitter for teaching: Can social media be used to enhance the process of learning?	2014 / London	i.	Twitter helped expanding the involvement of university social activities through information
				ii.	The use of Twitter in learning did not affect the presence of student in classes.
6.	Shannon B. Rinaldo, Debra A. Laverie, Suzanne Tapp and William F.	The benefits of social media in marketing education: Evaluating Twitter as a form of cognitive	2013 / United States	i.	Twitter provided benefits and fun in learning
				ii.	Twitter encouraged active involvement of students
				iii.	Twitter gave more motivation, and students who used Twitter got higher grade than those who did not use it

		Humphrey, Jr	flexibility hypertext		
7.	Estrella Martínez-Rodrigo and Pura Raya González	Elmicrobloggi-ng en el proceso de enseñanza-aprendizaje. Unaexperiencia académica con Twitter	2013 / Spain	i. i. ii.	Twitter learning increased interest in learning among students Twitter provided creativity and critical analysis when responding to answers Twitter also enhanced collaboration within the group
8.	Alasdair Blair	Democratising the learning process: The use of Twitter in the teaching of politics and international relations	2013 / No	i. ii. iii. iv.	Twitter as a means of communication tool for involvement of students in learning Opportunity to join group discussions through hashtags (#). Can implement direct communication and expand social relationships with more individuals, especially in the field of education Can simplify and facilitate information delivery as Twitter is limited to 140 characters
9.	Winner Dominic Chawinga	Taking social media to a university classroom: teaching and learning using Twitter and blogs	2017/ Malawi	i. ii. iii.	Continuous learning even outside the classroom. All students can interact with lecturers. Students will not miss the teaching content because material / notes and announcement will be notified on Twitter early on
10	Eva Kassens-Noor	Twitter as a teaching practice to enhance active and informal learning in higher education: The case of sustainable tweets	2012 / USA	i. ii.	Twitter as a medium of knowledge delivery The delivery of learning info using Twitter is easy to remember

Through synthesis reviews of some articles, several themes display the effects of using Twitter application in teaching and learning process as follows:

i.   Twitter application improves learning motivation
ii.   Twitter application facilitates learning understanding
iii.   Twitter application form collaborative learning
iv.   Twitter application simplifies management of teaching and learning process
v.   Twitter application improves academic achievement
vi.   Twitter application forms learning interaction
vii.   Twitter application is used as a source of information; and
viii. Twitter application generates ideas

Research Discussion

The Twitter application has helped to improve the motivation of learning when students are actively involved and having fun in learning process (Rinaldo et al., 2013; Rodrigo & Gonzalez, 2013). In addition, the Twitter application has also established student understanding towards learning process as implemented in Radiology course (Gonzalez & Gadbury-Amyot, 2016). Yakin & Tinmaz (2013) also implemented Twitter in the Social Science course which the majority of students can easily understand the lessons presented compared to without using Twitter.

The Twitter application also created a collaborative learning concept when Twitter has been used as a forum medium and facilitates conversations between students and lecturers (Tur, Marin & Carpenter 2017; Martínez Rodrigo & Raya Gonzalez, 2013). Twitter also can be used by students to share and talk about course content during or outside the classroom by searching, generating and sharing any learning content (Chawinga, 2016). The use of hashtag symbols (#) provides the opportunity to extend the discussion to certain topics or learning-related issue (Blair 2013).

Research articles also prove that Twitter application can simplify the teaching and learning process when there are some unique features such as '@ - calling' and '# hastag' which act as searching assistance on a learning topic, issue or any questions regarding learning (Yakin & Tinmaz, 2013) whether in the classroom or outside the classroom (Chawinga, 2017). In fact, Twitter can also improve academic achievement when students are actively involved in the teaching and learning process (Rinaldo et al., 2013) as students demonstrate creativity and solve some critical analysis of learning (Rodrigo, & Gonzalez, 2013).

In addition, the Twitter application can also create interaction in learning when Twitter pages can be followed by many users from around the world. Thus, communication and discussion can be conducted regardless of obstacles and boundaries (Gonzalez & Amyot, 2016; Blair, 2013) when the users only need to type '# hashtag' and enter the word without any dashes of any topics to search (Yakin & Tinmaz, 2013) for sharing any views and opinions (Chawinga, 2016). Through the Twitter application, students are also able to interact easily with lecturers in learning topics everywhere regardless of time and two-way communication can be created (Chawinga, 2017).

Twitter application browsed around the world make it a very diverse source of information resources. With simple textual content, this application facilitates the delivery of simple and accurate information about a learning topic (Gonzalez & Amyot 2016) as well as having a search engine that facilitates the procurement process of information (Tur, Marin &

Carpenter 2017). Using this application, learning notes and materials will be uploaded by lecturers and students where the shared materials can be used as reference at all times (Chawinga 2017; Noor 2012).

Generation of ideas can also be built through the use of Twitter application. It can gather ideas and opinions on a topic of learning. Students will then integrate the ideas (Tur, Marin & Carpenter, 2017) and the idea generation can contribute to a comprehensive understanding (Yakin & Tinmaz 2013).

Conclusion
In conclusion, Twitter application has given a great impression and many benefits on the pedagogical learning process in education system. The use of information technology in the 21st century has given a great impact especially to students and teachers. Social media is not only a connecting agent to the individual but if properly used social media can provide many benefits in life. This meta-synthesis study has highlighted some of the research findings related to Twitter application functions in pedagogical learning indicating that the Twitter application gives a good effect in pedagogical learning.

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