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# A Content Analysis on Articles Using Twitter in Education

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**Abstract:** Twitter is a micro blogging portal that proves extremely useful across academic applications. Teachers, students, and parents can benefit greatly of the advantages offered by using Twitter in education. Twitter is a popular social networking platform for microblogging, helps users to connect by sending short messages of up to 140 characters. Although it encourages individuals to be incessant, its importance is not evident in the educational sense. This paper is the first to explore longitudinal analysis of the use of Twitter in teaching and learning from 2006 to 2015 over 10 years, to consider whether it will help students or not. We identified and documented the research profile, how Twitter was used in school, the implications on communications and the effect on learning outcomes for students. The results suggest that Twitter has been used more widely for contact and appraisal purposes. While Twitter shows potential to improve connections between students and teachers, there remains a definitive cause between Twitter usage and teaching results. The use of a "push" technology including teacher submitting crucial course content, homework assignments and exam deadlines to students as well as a forum for peer engagement possibly is currently the most useful of Twitter. There are so many obstacles to use Twitter for teaching and learning. On the basis of our literature review, we suggested five recommendations that could better improve the educational importance of the use of Twitter. We have found some shortcomings of previous research and suggested potential work for education by using Twitter.

**Keywords:** *Social Media in Education, Twitter, content analysis, EBSCO.*

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## 1. Introduction

The life of a modern human is closely connected with information and communication technologies (ICT): from finding “how to do” tutorials on the Internet to distance education. In the 21<sup>st</sup> century, it is almost impossible to imagine a modern human without the information and communication technologies that fill his life, they permeate all areas of activity, and education is no exception. To understand the importance of ICT in Education, there is a need to define the meaning of ICT. According to Meenakshi (2013), ICT was defined as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information” (p. 3). Similarly, Sarkar (2012) stated that ICT is a “collection of technological tools to generate, distribute, collect and administer information” (p. 31). Furthermore, the strong influence of ICT on modern humans leads to a change in the traditional areas of communication. The Internet is becoming a platform for barrier-free communication between people of different cultures, cities, and countries. Hladikova (2018) believes that “we are constantly ‘connected’ through digital technologies” (p. 99). Social media allows for faster, better, and more continuous social interaction between Internet users: students, gamers, professionals, and just citizens who are united by common interests. Jones et al. (2010) stated that social networking websites are “tools that can be used by teachers and students to facilitate education” (as cited in Bicen & Uzunboylu, 2012). A unique feature of social media is that it helps Internet users find each other by re-establishing connections with friends of the past, neighbors, colleagues, or classmates. The basis of such systems is Web2.0 technology, which provides registration of users joining the network and monitors the relationship between them. Kurt, et al. (2019) stated that “one of the most significant influence of the internet is the ability to connect both technology and individuals viably and its utilization of the usage of Web 2.0 tools” (p. 111). Web 2.0 tools permit people to peruse data while networking with their companions simultaneously (Tuncay & Uzunboylu, 2010).

Over the past few years, researchers have been discussing the possibility of using social networks in education. Social media affects the development of e-learning and education in general, offering new methodological and technical solutions (Barnes & Lescault, 2015). Thus, special applications, as Twitter, Facebook, Instagram were developed. There is also a tendency to organize e-learning not based on Learning Management Systems (LMS), but popular social networks. Learning Management System

was defined as “an information system that facilitates e-learning by supporting teaching and learning activities and the administration and communication associated with them” (Klobas, & McGill, 2010).

In connection with the study of the possibilities of using social networks in education, the theory of social learning is becoming relevant, which consists in the assumption that people learn most effectively when they interact with other students by using Web 2.0 tools. The study conducted by Bicen & Uzunboylu (2013) on the use of social media in education, showed that “Facebook virtual environment helped teachers to do more activities with online students” (p. 658). They found out that the social media environment “convinced teachers that their students not only improved their teamwork but also improved their learning skills” (p. 665).

## 2. Twitter

Numerous numbers of studies carried out on the effectiveness and usefulness of Twitter integrated into the educational environment. Twitter and other similar microblogging social media tools were originally invented for the people to keep in touch and send up to 140 text characters with one single post or Tweet (Marwick & Boyd, 2011). Tweets can contain a message that can be sent viral to the world with the help of hashtags. (#) Twitter was investigated in the Portsmouth University, where it was integrated into the classroom to establish a connection between an educator and students demonstrated the fact that Twitter led to a more informal environment (Mottet et al, 2004). During the interview’s teacher-participants claimed that Twitter helped them to better and fully understand their students since student were free to type and express their personal feelings via social networking sites (Schroeder, Minocha, & Schneidert, 2010). Reid (2011) suggested that Twitter and other social media can create a space or environment where all ideas are allowed and where students use informal texting, therefore can help the process of learning. In the same way, Junco et al. (2011) argue that Twitter “may support collaboration, engagement, participation, and sharing among current and future teachers”.

The overall research aim of this paper was to develop a better and clear understanding of how Twitter is integrated into Education. The sub-objectives were determined to achieve the general aim are as follows:

1. What is the distribution of studies using Twitter according to publication years?
2. What is the distribution of studies using Twitter according to document types?

3. What is the distribution of studies using Twitter according to the subject areas?
4. What is the distribution of studies using Twitter according to organizations?
5. What is the distribution of studies using Twitter according to authors?
6. What is the distribution of studies using Twitter according to languages?
7. What is the distribution of studies using Twitter according to country/region?
8. What are the research methods used in educational articles containing Twitter?

### **3. Methodology**

The research paper examines the documents on Twitter in Education is based on the content analysis research technique. According to Holsti (1969), content analysis was defined as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (p. 14). Briefly, content analysis is the technique that compresses large amounts of data, gathered by the researcher, into fewer content categories based on rules of coding (Berelson, 1952)

#### ***Data collection and analysis***

To find the documents on Twitter being integrated into Education, three major Databases such as Web of Science, Scopus, and EBSCO were utilized to gather the in-depth data. The documents were accessed through Near East Grand Library's credentials. A search was conducted on the Web of Science, Scopus, and EBSCO databases utilizing the keywords "Twitter in Education". In the lights of above, since Twitter was founded on the 21<sup>st</sup> of March 2006, the researcher decided to set the year range between 2006 (the year of foundation) to 2020 (May). Due to the daily distribution of the documents in the databases, the researcher decided to set the year 2020 till May only. After the search conducted on three main databases, the search on Web of Science yielded 425 documents, Scopus yielded 313 documents, and the EBSCO yielded 1484 research documents respectively. It is worth mentioning the fact that abovementioned number of documents that have an Open Access, thus researcher was able to download and analyze them (please see Figure 1, Figure2, Figure 3). The documents retrieved through the Web of Science, Scopus and EBSCO databases were investigated and

the data was analyzed using the descriptive statistical methods, in other words, percentage, and frequency as well as a graph.

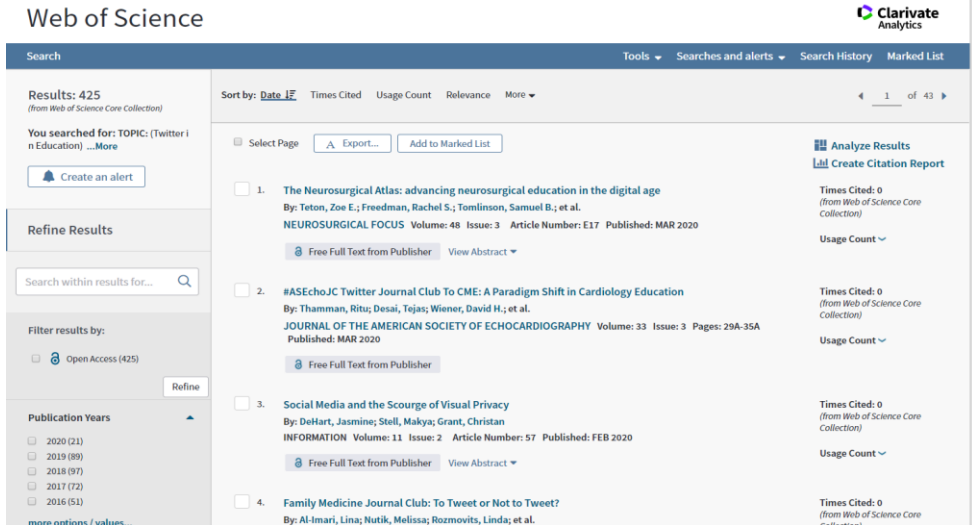


Figure 1 - The interface of the Web of Science database with “Twitter in Education” keywords

Source: Web of Science database

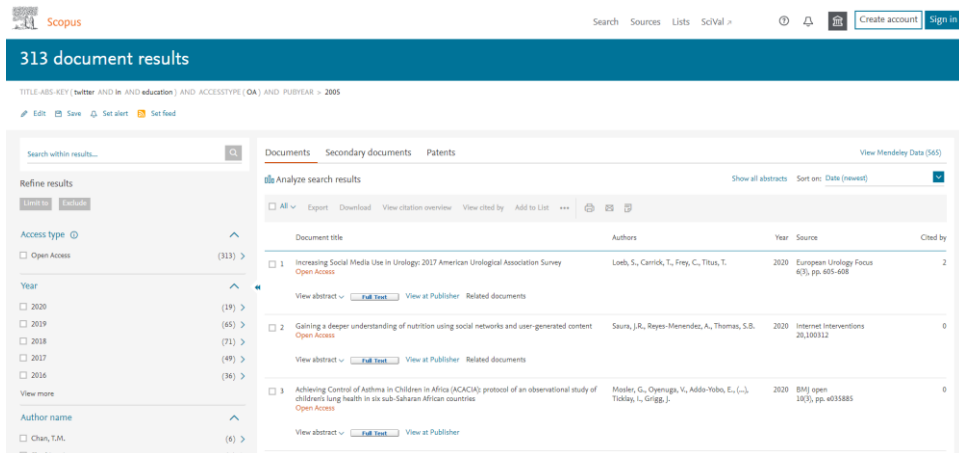
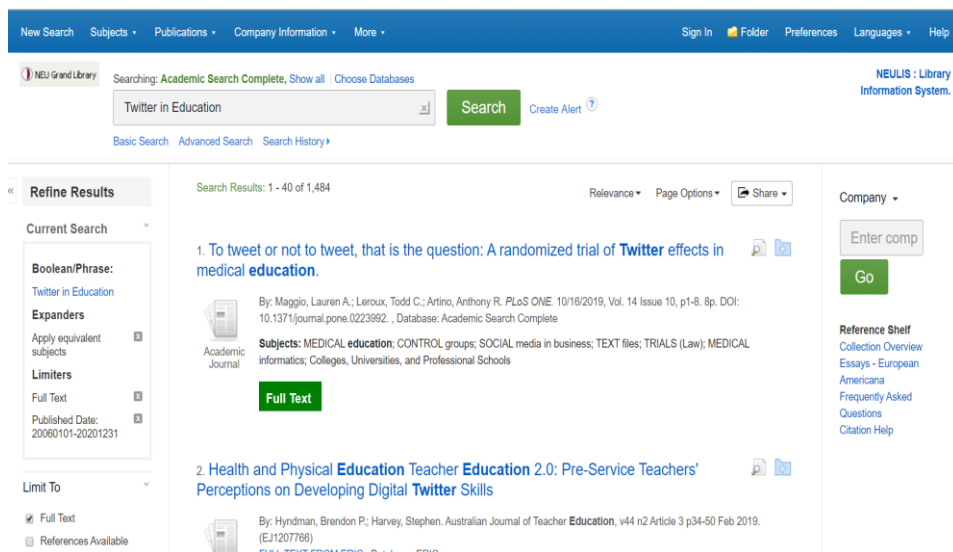


Figure 2 - The interface of the Scopus database with “Twitter in Education” keywords  
Source: Scopus database

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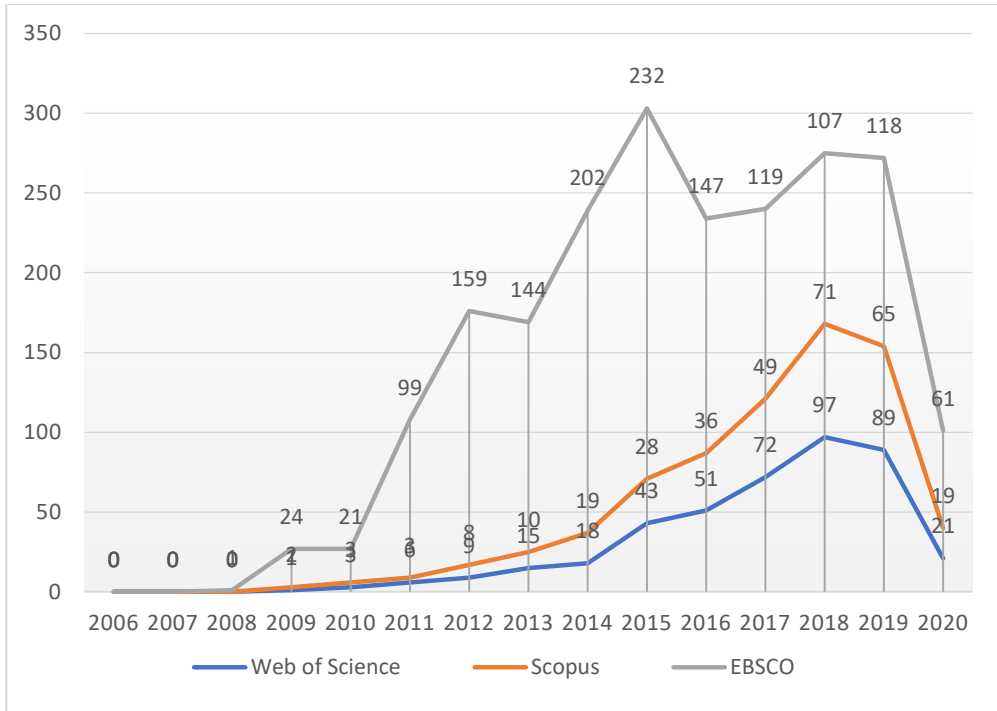
**Figure 3** - *The interface of the EBSCO database with “Twitter in Education” keywords*  
*Source: EBSCO database*

## 4. Results and Comments

### 4.1. Years of Publication

In the beginning, the distribution of the documents accessed through Web of Science, Scopus and EBSCO, within the years 2006 to 2020 were analyzed. On this basis, 425 documents were retrieved from Web of Science, 313 from Scopus as well as 1434 documents were retrieved from the EBSCO database. The distribution of the documents over the years is presented in Table 1.

**Table 1**  
*Years of Publication*  
*Source: Authors' own conception*



It can be seen in the Table 1, that the distribution of studies on twitter in education has been increased over the years through all three major databases. When the distribution of studies on the integration of twitter in education was analyzed by years, the highest number of documents observed in 2015 (EBSCO,  $f=232$ ). In case of Scopus, the highest year of the distribution was observed in the 2018 with 71 documents. In addition, Web of Science is in the light with Scopus that has highest number of documents distributed in 2018. As can be observed in Table 1, the overall popularity of Twitter as a source of knowledge in Education has been increased over the years, specifically from 2009 till 2020. The lowest number of studies were observed in the years between 2008 and 2010 when the Twitter was just earning its popularity in the world market.

## 4.2. Document type

**Table 2**  
*Studies by Document Types*  
Source: Authors' own conception

Document Type	Web of Science	Scopus	EBSCO
Article	350 (81.585%)	238 (76.038%)	798 (93.772%)
Review	32 (7.459%)	35 (11.182%)	27 (3.172%)
Conference Paper	31 (7.226%)	25 (7.987%)	13 (1.527%)
Editorial	12 (2.797%)	7 (2.236%)	8 (0.940%)
Book Chapter	2 (0.466%)	5(1.597%)	3 (0.352%)
Letter	1 (0.233%)	2 (0.638%)	1 (0.117%)
Erratum	1 (0.233%)	1(0.319%)	1 (0.117%)
<b>Total</b>	<b>429 (100%)</b>	<b>313 (100%)</b>	<b>851 (100%)</b>

The distribution of the source type of studies retrieved through the three major databases such as Web of Science, Scopus and EBSCO regarding the use of twitter in education can be seen in Table 2. Considering the information, articles (WOS, f=350; Scopus, f=238; EBSCO, f=798) were found to have the highest distribution on all three databases followed by review papers with (WOS, f=32; Scopus, f=35; EBSCO, f=27) of the whole distribution. The least distributed number of document tape was seen as erratum with an equal frequency score and percentage on all three databases (f=1).

## 4.3. Subject Areas

**Table 3**  
*Studies by Subject Areas*  
Source: Authors' own conception

Subject Area	Web of Science	Scopus	EBSCO
Medicine	137(50.367%)	132 (33.673%)	215 (41.910%)
Social Sciences	43 (15.808%)	114 (29.081%)	83 (16.179%)
Computer Science	31 (11.397%)	53 (13.520%)	49 (9.551%)
Engineering	25 (9.191%)	26 (6.632%)	42 (8.187%)
Agriculture	10 (3.676%)	17 (4.336%)	33 (6.432%)
<u>Multidisciplinary</u>	9 (3.308%)	14 (3.571%)	30 (5.847%)
<u>Nursing</u>	9 (3.308%)	14 (3.571%)	29 (5.653%)
Arts and Humanities	5 (1.838%)	13 (3.316%)	26 (5.068%)
Microbiology	3 (1.102%)	9 (2.295%)	6 (1.169%)
<b>Total</b>	<b>272 (100%)</b>	<b>392 (100%)</b>	<b>513 (100%)</b>

The distribution of the subject areas of documents retrieved through the three databases regarding the use of twitter in education can be seen in Table 3. When analyzed according to subject areas, it was found that twitter was popular in medicine field with (WOS, f=137; Scopus, f=132; EBSCO, f=215) of the distribution as well as in social sciences (WOS, f=43; Scopus, f=114; EBSCO, f=83), computer engineering (WOS, f=31; Scopus, f=53; EBSCO, f=49). The lowest number of studies were conducted in microbiology (WOS, f=3; Scopus, f=9; EBSCO, f=6).

#### 4.4. Organizations

**Table 4**  
*Articles by Organizations*  
*Source: Authors' own conception*

Organizations	Web of Science	Scopus	EBSCO
University of California System	22(19.130%)	7(14.583%)	18 (16.981%)
University of London	19(16.521%)	7 (14.583%)	16 (15.094%)
Harvard University	12 (10.434%)	7 (14.583%)	14 (13.207%)
Mcmaster University	12 (10.434%)	6 (12.500%)	14 (13.207%)
University of Southern California	10 (8.695%)	6(12.500%)	10 (9.433%)
Johns Hopkins University	10 (8.695%)	5 (10.416%)	10 (9.433%)
PCSOHE	10 (8.695%)	4 (8.333%)	9 (8.490%)
Rush University	10 (8.695%)	3 (6.250%)	8 (7.547%)
University of Toronto	10 (8.695%)	3 (6.250%)	7 (6.603%)
<b>Total</b>	<b>115 (100%)</b>	<b>48 (100%)</b>	<b>106 (100%)</b>

Table 4 demonstrates the distribution of documents on twitter in educating according to the top nine organizations. In a view of gathered data, the organization with the highest value of the distribution was seen in University of California System (WOS, f=22; Scopus, f=7; EBSCO, f=18). It is interesting that Scopus revealed only seven documents conducted in University of California System in compare with Web of Science and EBSCO. The second highest frequency of distribution was observed in University of London (WOS, f=19; Scopus, f=7; EBSCO, f=16). Following Harvard University (WOS, f=12; Scopus, f=7; EBSCO, f=14), McMaster University (WOS, f=12; Scopus, f=6; EBSCO, f=14). The least number of documents were distributed in University of Toronto (WOS, f=10; Scopus, f=3; EBSCO, f=7).

#### 4.5. Authors

**Table 5**  
*Documents by the Authors*  
*Source: Authors' own conception*

Authors	Web of Science	Scopus	EBSCO
Gottlieb M	9 (15.789%)	7 (17.073%)	8 (17.021%)
Chan TM	8 (14.035%)	6 (14.634%)	7(14.893%)
Thoma B	7 (12.280%)	6 (14.634%)	7 (14.893%)
Unger JB	6 (10.526%)	5 (12.195%)	5(10.638%)
Allem JP	5 (8.771%)	3 (7.317%)	4 (8.510%)
Chu KM	5 (8.771%)	3 (7.317%)	4 (8.510%)
Cruz TB	5 (8.771%)	3 (7.317%)	4 (8.510%)
Boysen-Osborn M	4 (7.017%)	3 (7.317%)	3 (6.382%)
Cooney R	4 (7.017%)	3 (7.317%)	3 (6.382%)
Gardner JM	4 (7.017%)	2 (7.317%)	2 (4.255%)
<b>Total</b>	<b>57 (100%)</b>	<b>41 (100%)</b>	<b>47 (100%)</b>

Table 5 illustrates the distribution of documents on twitter in educating according to the top ten authors of the studies. In a view of gathered data, author with the highest value of the distribution was seen by Gottlieb (WOS, f=9; Scopus, f=7; EBSCO, f=8). The second highest number of studies distributed was seen by Chan (WOS, f=8; Scopus, f=6; EBSCO, f=7). According to the table 5, the least number of studies were conducted by Gardner (WOS, f=4; Scopus, f=2; EBSCO, f=2).

#### 4.6. Languages

**Table 6**  
*Documents by the Articles Languages*  
*Source: Authors' own conception*

Subject Area	Web of Science	Scopus	EBSCO
English	383 (90.117%)	297 (93.396%)	724 (95.137%)
Spanish	34 (8.000%)	16 (5.031%)	12 (1.576%)
Russian	3 (0.705%)	2 (0.628%)	11 (1.445%)
Turkish	3 (0.705%)	1 (0.314%)	10 (1.314%)
Portuguese	2 (0.470%)	1 (0.314%)	2 (0.262%)
Ukrainian	0 (0.000%)	1 (0.314%)	1 (0.131%)
Arabic	0 (0.000%)	0 (0.000%)	1 (0.131%)
<b>Total</b>	<b>425 (100%)</b>	<b>318 (100%)</b>	<b>761 (100%)</b>

Table 6 illustrates the distribution of the publication's languages on twitter in education provided by three databases. It can be seen in Table 6, that the highest number of articles in all three databases were written in the English language (WOS, f=383; Scopus, f=297; EBSCO, f=724), and Spanish (WOS, f=34; Scopus, f=16; EBSCO, f=12) comes at the second place. According to the results, it was demonstrated that English was the dominant language in the researches on twitter in education. However, there are few other articles were written in different languages, such as Portuguese (WOS, f=2; Scopus, f=1; EBSCO, f=2), Ukrainian (Scopus, f=1; EBSCO, f=1) as well as Arabic (WEBSCO, f=1) respectively.

#### 4.7. Countries

**Table 7**  
*Articles by the Countries/Regions*  
*Source: Authors' own conception*

Subject Area	Web of Science	Scopus	EBSCO
USA	168(40.481%)	129 (42.156%)	24 (32.876%)
England	66 (15.903%)	54 (17.647%)	12 (16.438%)
Spain	61 (14.698%)	33 (10.784%)	9 (12.328%)
Canada	38 (9.156%)	28 (9.150%)	9 (12.328%)
Australia	30 (7.228%)	19 (6.209%)	7 (9.589%)
Saudi Arabia	17 (4.096%)	18 (5.882%)	4 (5.479%)
China	12 (2.891%)	9 (2.941%)	4 (5.479%)
Turkey	12 (2.891%)	8 (2.614%)	3 (4.109%)
Germany	11 (2.650%)	8 (02.614%)	1 (1.369%)
<b>Total</b>	<b>415 (100%)</b>	<b>306 (100%)</b>	<b>73 (100%)</b>

Table 7 demonstrates the distribution of documents on twitter in educating according to the top nine countries/regions of publications. It can be seen in table 7 that United States of America takes the first place in all three databases, specifically (WOS, f=168; Scopus, f=129; EBSCO, f=24) and England (WOS, f=66; Scopus, f=54; EBSCO, f=12) as the second highest country of the distribution of documents in twitter in education. Under these findings, it was clear that USA, England and Spain attached more contribution to the field. In addition, the lowest number of the documents were distributed in Germany (WOS, f=11; Scopus, f=8; EBSCO, f=1).

#### **4.8. What are the research methods used in educational articles containing Twitter?**

**Table 8**

*Distribution of the articles on the use of Twitter on Education by the types of research applied*

*Source: Authors' own conception*

Subject Area	Web of Science	Scopus	EBSCO
Mixed Method	69 (42.857%)	55 (41.984%)	129 (47.426%)
Quantitative	57 (35.403%)	46 (35.114%)	87 (31.985%)
Qualitative	34 (21.118%)	28 (21.374%)	51 (18.750%)
Documentary Review	1 (0.621%)	2 (1.526%)	5 (1.838%)
<b>Total</b>	<b>161 (100%)</b>	<b>131 (100%)</b>	<b>272 (100%)</b>

Table 8 demonstrates the type of the research utilized in articles on twitter in education published between the years of 2006-2020 (May). It can be seen in the Table 8 that the articles using the mixed research design has the highest value provided by all three major databases (WOS, f=69; Scopus, f=55; EBSCO, f=129), while quantitative research design was seen with the second highest value (WOS, f=57; Scopus, f=46; EBSCO, f=87) and qualitative research design with (WOS, f=34; Scopus, f=28; EBSCO, f=51). The least number of documents utilized the documentary review technique (WOS, f=1; Scopus, f=2; EBSCO, f=5) which shows the deficiency and the gap in the studies on twitter in education.

### **Discussions**

The research paper was designed as content analysis that was proposed with the search conducted on three major databases such as Web of Science, Scopus and EBSCO with the keywords selected as “Twitter in Education”, eight sub-objectives were narrowed down. The Web of Science revealed 425, Scopus 313 and the EBSCO 1484 Open-Access documents that were downloaded, categorized and analyzed with the help of descriptive statistical analysis. Moving from the first sub-purpose of the study, when distributions of documents on Twitter in Education were analyzed by years, it was found out that the highest year was seen as 2015 in the EBSCO database with (f=232) documents distributed, whereas Web of Science and Scopus demonstrated the year of 2018 as the highest years of publications. Based on the results provided in Table 1, it can be stated that twitter has been gaining its popularity among both teachers and students in the field of education, as well as the studies have been increased in publications over the

years between 2006 to 2020(May). A study that supports this result was also made by Paskevicius et al (2018). The researchers support the fact that twitter was highly popular and was integrated into education in 2015. When the documents on twitter in education were analyzed under document type, it was seen that the documents were mainly distributed as articles with (WOS, f=350; Scopus, f=238; EBSCO, f=798) and review research papers with (WOS, f=32; Scopus, f=35; EBSCO, f=27) following up with documents published as conference papers (WOS, f=31; Scopus, f=25; EBSCO, f=13) and the least amount of documents were distributed as erratum (WOS, f=1; Scopus, f=1; EBSCO, f=1) respectively.

Considering the number of studies by subject areas, it was found that twitter was popular in medicine (WOS, f=137; Scopus, f=132; EBSCO, f=215) and in social sciences (WOS, f=43; Scopus, f=114; EBSCO, f=83). Besides, the least number of studies on Twitter were in microbiology (WOS, f=3; Scopus, f=9; EBSCO, f=6). When the documents on Twitter in Education were examined according to the organizations, it is found that the University of California System (WOS, f=22; Scopus, f=7; EBSCO, f=18) put the most effort in the contribution of publications. The second highest organization was seen as University of London with (WOS, f=19; Scopus, f=7; EBSCO, f=16), following the Harvard University (WOS, f=12; Scopus, f=7; EBSCO, f=14). It was also found out that the least amount of document was produced by the University of Toronto (WOS, f=10; Scopus, f=3; EBSCO, f=7).

When the authors of the studies on twitter in education between the years of 2006 and 2020 (May) were analyzed, it was found that Gootlieb published the highest number of articles (WOS, f=9; Scopus, f=7; EBSCO, f=8), following Chan (WOS, f=8; Scopus, f=6; EBSCO, f=7), Thoma (WOS, f=7; Scopus, f=6; EBSCO, f=7), Unger (WOS, f=6; Scopus, f=5; EBSCO, f=5), Allem (WOS, f=5; Scopus, f=3; EBSCO, f=4). The least number of documents were distributed by Gardner (WOS, f=4; Scopus, f=2; EBSCO, f=2).

When the source's languages on the twitter in education between the years of 2006 and 2020 (May) were analyzed, it was found that English language (WOS, f=383; Scopus, f=297; EBSCO, f=724) was chosen to be the dominant language in the field of education. This could be attributed to the fact that English is the most spoken language worldwide (Seals & Shah, 2018). The second highest sources language was found as Spanish language (WOS, f=34; Scopus, f=16; EBSCO, f=12) respectively. Furthermore, there are few other articles written in different languages, such as Russian (WOS, f=3; Scopus, f=2; EBSCO, f=11), Turkish (WOS, f=3; Scopus, f=1;

EBSCO, f=10), Portuguese (WOS, f=2; Scopus, f=1; EBSCO, f=2). It was found in the EBSCO database that only one study was written in Arabic language.

When the countries of publications on the studies on twitter in education within the year range of 2006 to 2020 (May) were investigated, it is found out that most of the researches was conducted in United States of America (WOS, f=168; Scopus, f=129; EBSCO, f=24). This was followed by England (WOS, f=66; Scopus, f=54; EBSCO, f=12), Spain (WOS, f=61; Scopus, f=33; EBSCO, f=9), Canada (WOS, f=38; Scopus, f=28; EBSCO, f=9). The least amount of studies on Twitter in Education was seen in China (WOS, f=12; Scopus, f=8; EBSCO, f=4), Turkey (WOS, f=12; Scopus, f=8; EBSCO, f=3) as well as Germany (WOS, f=11; Scopus, f=8; EBSCO, f=1) respectively.

## Conclusions

Among the research designs that included the use of twitter in the field of education, the highest percentage of the method used by the researcher was the studies using mixed research design with the highest rate of (WOS, f=69; Scopus, f=55; EBSCO, f=129) while quantitative research design (WOS, f=57; Scopus, f=46; EBSCO, f=87). The least used research method was the qualitative research design (WOS, f=34; Scopus, f=28; EBSCO, f=51). It was found that articles on the use of Twitter in Education tended to use mixed research design more in compare with other research design, such as quantitative and qualitative research design. The study that also supports this finding is the study conducted by Paskevicius et al (2018). The researchers came to the conclusion that twitter in the fields of education was seen more using the mixed research design as it assists with gathering in-depth data.

The research was limited to be selected and reviewed articles in the three major databases, such as Web of Science, Scopus and EBCO within the year range of foundation of Twitter 2006 till nowadays 2020 (May). It can be suggested that further research papers can investigate the documents in a different database such as Google Scholar, Science Direct. The further research may increase the number of sub-objectives to gather in-depth data.

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