RESEARCH ARTICLE

MAJOR TRENDS IN DISTANCE EDUCATION RESEARCH: A COMBINATION OF BIBLIOMETRIC AND THEMATIC ANALYZE

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ABSTRACT

This study intends to explore the current trends in the field of distance education research catalogued in Web of Science (WoS) database during 1980-2016. Mainly bibliographic description and social network analysis was employed to investigate the structure and patterns of information exchanged within the field of distance education research and also to interpret the interrelationship between keywords indicated in these articles. A total of 500 most cited articles (out of 6,141 relevant to the topic) were reviewed to examine the impact of factors such as journal DOI and keywords on the number of citations that they received. We also identified major trends in distance education literature including variation across publication and citation year, top ranking of institutions and top ranking of published papers based on authors, subject area and co-authorship collaboration between countries. Our results show that the most cited articles are from two institutions of United States and United Kingdom and the most prolific years in terms of number of published articles and citations are 2013.We also found non-significant and very small correlation between the number of citation and DOI number of the journals. Our study serves as a resource for future studies by indicating how trends in distance education research have gradually developed over time and demonstrating the characteristics of the most cited articles in this literature.

INTRODUCTION

Technology has influenced dramatic changes within the higher education learning environment. According to Harasim (2000), the invention of the Web technologies made online education increasingly accessible, open, flexible; allowed new pedagogical models to emerge and reasoned the revolution in digital knowledge age that enabled greater and faster human communication and collaboration (Bozkurt, Ozbek, *et al.,* 2015). In other words, with the rapid development of technology, online instruction has emerged as an alternative mode of teaching and learning and a substantial supplement to traditional teaching (Tallent-Runnels *et al.,* 2006). Historically, distance education has always relied on technology for reaching learners (Allan, 2004). A national survey from the Sloan consortium reported that the majority of the faculty members in colleges and universities viewed distance education as capable of providing equal or superior learning experiences compared to those from traditional classroom instruction (Chahino, 2011).

There fore, distance education is a very popular and intriguing area in the present realm of education (Schulte, 2011), specially, it is providing to be a viable option in higher education (Freitas *et al.,* 2016). Paradigm shift in education has resulted in: new modes of educational delivery, new learning domains, new principles of learning, new learning processes and outcomes and new educational roles and entities (Bozkurt, Ozbek, *et al.,* 2015). Hence, educators and students often believe that using distance education promotes the concept of "green revolution" (Lei and Gupta, 2010). Distance education (DE) as a multidisciplinary field has reacted to these changes; it has and is still evolving and orienting itself to fulfill this demand. Thus, as the demands of educators and learners evolve, it is crucial to understand and get a deeper insight of trends and issues in DE so as to keep abreast of these constant changes (Bozkurt, Ozbek, *et al.,* 2015). Therefore, with the opportunities confronting distance education, there are a number of studies that highlights an increase of distance programs in higher education (Boston, Diaz, Gibson, Ice, Richardson, and Swan, 2010; Daniel, 2012; Ferguson and DeFelice, 2010; Glassmeyer, Dibbs, and Jensen, 2011; Shea, Vickers, and Hayes, 2010; Macon, 2011).

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Through the application of quantitative and qualitative analysis, this paper provides a mapping of publications related to distance education, aiming to offer researchers interested about the subject of a systematic review of the main publications, source of scientific information, authors and geographical origin of those studies (Zancanaro, Todesco, and Ramos, 2015). However, bibliometric analysis which refers to combining different frameworks, tools, and methods to study and analyze citations of scholarly publications, has led to development of different metrics to gain insights into the intellectual structure of a broad academic discipline and evaluate the impact of scientific journals, studies, and researchers according (Akhavan, Ale Ebrahim, Fetrati, and Pezeshkan, 2016), and literature review deals with the collecting of publications on a specific subject (Zancanaro *et al.,* 2015). Hence, the recoveries of this kind of analysis are very useful to find out research trends in many research fields (Wang, Fu, and Ho, 2011).

Literature review analyses have been vastly adopted by prior studies in distance education research (Means, Toyama, Murphy, Bakia, and Jones, 2009;Bozkurt *et al.,* 2015; Stein, Wanstreet, and Krisch, 2011; Zawacki-Richter, 2009; Zawacki-richter, Bäcker, and Vogt, 2009; Simonson and Schlosser, 2011). For instance, Cheng et al. (2014) presented a bibliometric analysis of 324 articles on workplace e-learning published in academic journals and conference proceedings from 2000 to 201 2 into four dimensions: e-learning for continuing education and professional development, e-learning in the healthcare sector, use of social media for e-learning, and the integration of knowledge management with e-learning to demonstrate a comprehensive picture and a holistic view of the workplace e-learning domain. In addition to review analysis, prior research has utilized other methods and approaches to study the major trends, findings, and implications of distance education studies. For example, Zawacki-Richter (2009) conducted a study by using a Delphi technique to develop a classification of research areas. Similarly, U.S. Department of Education (2009) applied meta-analysis and review of 51 studies to provide a state-of-the-research report on the effectiveness of online/distance education (Means, Toyama, Murphy, Bakia, and Jones, 2009).

Although, all of these studies enhance our understanding of distance education research, but brief overview of these works reveals that some of reports are misleading. However, as distance learning becoming one of the fastest growing trends in educational uses of technology and emergence of journals such as American Journal of Distance Education (AJDE) dedicated to DE studies, there is a need to mirror the distance education field to be able to understand and interpret the new dynamics, namely distance education trends (Bozkurt, Akgun-Ozbek, *et al.,* 2015). Therefore, this study intend to explore the current trends in the field of distance education research during the period of 1980-2016 by an extensive review of Thomson Reuter' Web of Science (WoS) Core Collection , which is a structured database that indexes selected publications from various disciplines (Akhavan *et al.,* 2016). A total of 6,141 samples of distance education publications were reviewed. Mainly content analysis was employed to be able to analyze the current research. Hence, according to previous research articles published in accepted journal in the field, the main important trends were organized into the following categories: research topics, indicated keywords, chosen research area, number of

publication per year, theoretical/conceptual backgrounds, most cited publications, cited references, cited authors, institutions and countries with more publications and focused variables but the articles reviewed do not reflect current data. Thus, the result of this study aims to help educators and researchers spot recent distance education trends by studying written scholarly documents that may be useful in the exploration of potential research areas.

MATERIALS AND METHODS

Researchers use different methods to identify papers to consider for a literature review (Ellis 1989; Ellis and Haugan, 1997): Methods include searching in databases or search engines and chaining from known research papers (Liyanagunawardena, Adams, and Williams, 2013). As has been suggested by Lee, Driscoll, and Nelson (2004), understanding trends is pivotal in advancement of research on distance education. Qualitative and quantitative method enables us to do this. We collected data from the "Web of Science Core Collection" database that includes "SCI-EXPANDED", "SSCI", "AandHCI", "CPCI-S", and "CPCI-SSH" to include articles with an acceptable level of quality (Akhavan *et al.,* 2016). This paper reviewed articles published from period 1980 until 2016, then utilized Education Resources Information Center (ERIC) thesaurus of distance education keywords and also used Boolean combination of distance education to retrieve relevant articles. We identified 24 different keywords that had frequently appeared in the title of papers in our samples and were directly related to distance education. We based our search on this inclusive set of keywords, which resulted in a sample of 6,141 articles: Distance learning, online learning, distance education, online education, virtual Learning, virtual classrooms, virtual university, online courses, distance courses, online university, online study, online study, web-based learning, web-based instruction, web-based course, learning management system (LMS), E-learning, distance based training, Internet based training, course management system, correspondence education, asynchronous communication, asynchronous online class, synchronous communication.

For the purpose of this study, the software tool VOSviewer Version 1.6.2) (van Eck and Waltman, 2010; 2013; 2014) was used for constructing and visualizing bibliometric analysis from titles and abstract of articles published in the WoS over the period 1980-2016. The journals indexed in Web of Science journal has been selected for this purpose because it covers all scientific areas. Titles and abstracts of peer-reviewed articles were used for the purposes of this analysis because they are usually lexically dense and focus on the core concepts, themes and results of research (Zawacki-Richter and Naidu, 2016). Furthermore, we designed our measurement of the number of citations studies have received from our sample. Thereafter, we designed and calculated a citation index for each study as the average number of citations per year. Then, we ranked the studies in our sample based on this index to identify top 500 articles with highest citation index. We used this sub-sample for our core analyses. However, for more general analyses full sample (i.e., 6,141 studies) has been used as described in the result section. The following discussion included two sections to determine the scientific performances and research activity trends. The first section dealt with number of publication and citation in each year, top ranking of institution, author and

subject area. The other section focused on the research emphases and trends by document type, author keywords and characteristic of countries, as well as the correlation of Journal DOI and number of pages with citation.

RESULTS

The first trend that we describe is the time trend of distance education publications and their annual citations in our sample. The earliest research on distance education was published in 1987. Figure 1 and 2 presents the number of articles on distance education published in each year from 1987 to 2016. The bar chart and the interpolation line on the bars show that the number of articles on distance education continued to increase in general, and the field was growing and attracting more research interests, especially during 2004-2015. During the study period, the cumulative number of articles grew from 12 in 1987 to 624 in 2013. The number of publications in 2013 accounts for 10% of the entire sample.
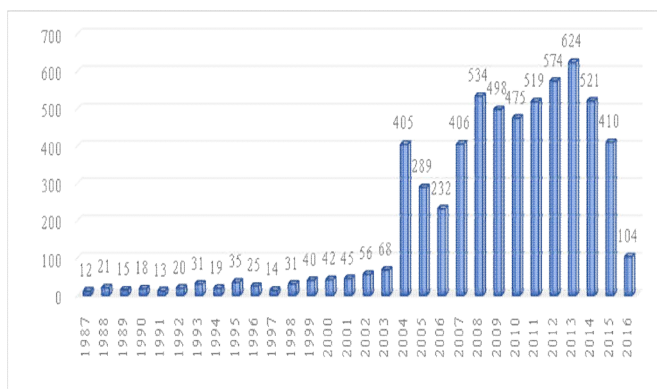

Fig. 1. Number of published papers in distance education
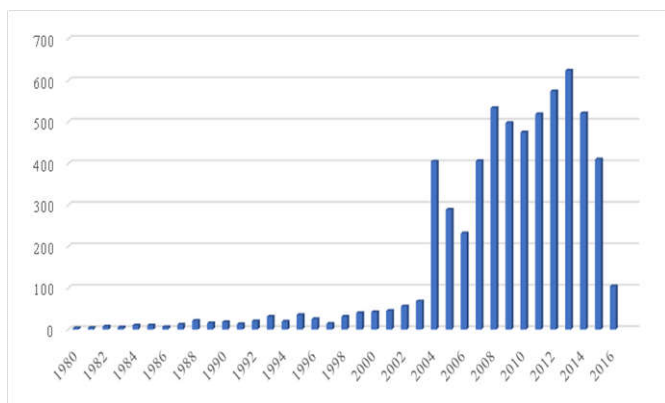

Fig. 2. Citation in each year (WoS database, data retrieved on 26 July 2016 access from University of Malaya)

However, it appears that distance education has received much attention from researchers, which leads to a rapid growth of related papers and citations, as illustrated in Figure 1 and 2. According to numerical data, a large amount of research papers published during 2008-2015 have been catalogued in the web of science database, with the distribution rate of 534(8.696), 498 (8.109), 475 (7.735), 519 (8.451), 574 (9.347), 624 (10.161), 521 (8.484), 410(6.676) respectively, against the total number of papers indexed. Between these number of publications there is a sudden significant surge in 2013 (624) indicating that in a short period around 2013, distance education topics drown much attention among online scholars.

Table 1 offers a closer look at the distribution of academic institutions by which the indexed papers were submitted. Based on the published studies related to distance education, England is the most productive country. And its institution Open University UK received the highest record of published papers (122, 1.987% of 6141). Also, FLORIDA STATE UNIVERSITY SYSTEM, which belongs to USA, is among the top ten countries for publication (0.896 % of 6141).Furthermore, among these top ten universities, four institutions are from United States and two institutions are from England. Table 2 offer an investigation into the authors who have written the most papers related to distance education.

Table 1. The top ranking of institutions with records of publication in distance education

Institution Name	Count	% of 6141	Country
Open university uk	122	1.987	England
Florida state university system	55	0.896	USA
University of north carolin	47	0.765	USA
Athabasca university	46	0.749	Canada
University of london	41	0.668	England
University of south africa	37	0.603	South Africa
University system of georgia	36	0.586	USA
National distance education Univversity (ndeu)	33	0.537	SPAIN
Anadolu university	33	0.537	TURKEY
Pennsylvania commonwealth System of higher education pcshe	31	0.505	USA

Table 2. The top ranking of published papers in distance education based on authors

Rank	Subject Area	Count	% of 6141
1	Richardson jte	27	0.44
2	Deeson e	17	0.277
3	Colibaba a	16	0.261
4	Cook da	15	0.244
5	Tsai cc	14	0.228
6	Harden rm	14	0.228
7	Kinshuk	13	0.212
8	Castro m	13	0.212
9	Mishra s	12	0.195
10	Chen cm	12	0.195

The Table reports that 0.44 % of 6141 published papers belong to Richardson, which shows high position of publication, followed by Deeson. E (17, 0.277), that ten times is lower than Richardson. But the numbers of published papers by other authors are in the same range respectively. With a view to provide insight into the future directions of distance learning research, the discussion now turns to the application of distance learning. Table 3 shows the top 10 subject areas in which distance learning is most widely utilized based on our retrieval runs of WoS database. Among all the subject matters listed here, Education and Educational Research takes the lead with 6107 papers (99.446) against the total of 1641 papers retrieved. Computer science ensues, with 1769 papers recorded (28.806).Following that, the top ranking of published papers based on subject area is by Engineering (352), Information Science and library Science (214; 3.485%) and Social science(143;2.329). Referring to Figure 3, Education and Educational Research in compare to Computer Science, Engineering, Information Science and Library Science and Social Science has highest rate of publication every year and peaking in 2013, but other subject areas have slight fluctuation between these years.

Document types

Based on our data set information, there were 6141 information sources published in distance education area from 1980 to 2015 (Table 4) within 12 document types.

Table 3. The top ranking of published papers in distance education based on subject areas

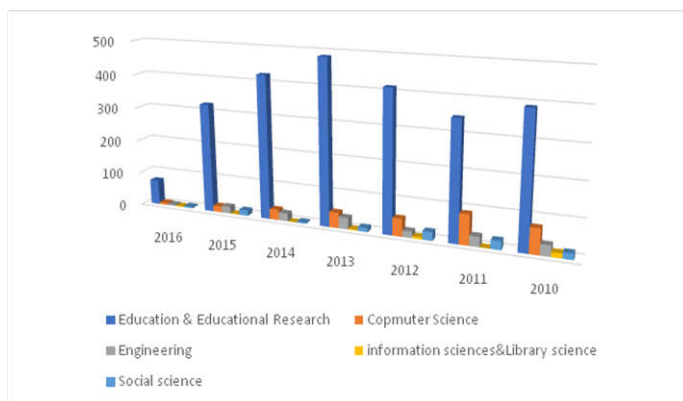| Rank	Subject Area	Count	% of 6141
1	Education & educational research	6107	99.446
2	Computer science	1769	28.806
3	Engineering	352	5.732
4	Information science & library science	214	3.485
5	Social sciences	143	2.329
6	Health care sciences services	126	2.052
7	Business economics	125	2.035
8	Psychology	101	1.645
9	Social issues	88	1.433
10	Telecommunications	65	1.058

Fig.3. Yearly Distribution of Top 5 Subject Areas

Table 4. Document types of the distance education in the 35 selected years

Document types	Number of total articles	%
Proceedings paper	3597	58.57
Article	2091	34.05
Book review	341	5.55
Editorial material	96	1.56
Review	46	0.75
News item	18	0.29
Letter	16	0.26
Meeting abstract	10	0.16
Note	8	0.13
Correction	5	0.08
Discussion	1	0.01
Bibliography	1	0.01

Among them, there were 3597(58.57 per cent) proceedings paper and 2091 (34.05 per cent) original articles which, consequently, mean that proceedings paper articles were the dominant document type comprising 92.62 per cent of the total distance education literature. The next document type was book review (n = 341; 5.55 per cent), followed by editorial material (n = 96; 1.56 per cent), review (n = 46; 0.75 per cent). Minimum numbers of information sources have been published within the biographical items (n = 1; 0.01 percent) and discussion paper (n = 1; 0.01 percent) document types.

Journal DOI and number of citations

To conduct a deeper analysis, the researchers focus on the top 500 most cited papers to investigate the relationship between journal DOI and number of citations of articles in our sample. Although, there is no evidence in literature to show this kind of relationship, data analysis has been done by researcher to figure it out. Hence, we calculated Spearman' Rho correlation which resulted in the value of 0.034 (p value 0.44). This non-significant and very small correlation demonstrates that there is no significant relationship between the number of citations and DOI number of the journals. That is not surprising because there is no research to show any relationship between these two items.

Number of pages and number of citations

In this part of the research, the researchers were willing to know whether there is a significant relationship between the length of the publications in their sample and the number of citations that they have received. Theminimum, maximum, mean value, and standard deviation of number of pages are 2, 60, 15.15, and 6.32, respectively. In this section, the researchers calculated the Pearson correlation. The Pearson's value is 0.17 (p value 0.0001), which implies a significant and positive impact for the number of pages in a publication on the number of citations that a study is likely to receive. The greater length can reflect scientific complexity and rigorous methodological quality of a publication (Ale Ebrahim *et al.,* 2013, Falagas et al. 2013). Additionally, longer articles provide more information that can be cited and referred to by other studies.

Keywords indicated

In this part of the study, in order to have comprehensive view of distance education, the researchers conducted some analysis on the most frequently used keywords in the articles. In this study a total of 7,113 keywords were included in the study and ranked according to their frequency of appearance in the articles in general. The frequency count presents a descriptive analysis of the top 40 keywords. Hence, in order to recognize and quantify the influence and importance of the relationship among frequently used keywords, social network analysis (SNA) was conducted for the top 40 keywords and a complete network model was visualized based on their relations using centrality distribution.Fig.4 illustrates top 40 keywords indicated in our data set. Social network analysis is a technique that deal with mapping and measuring of relationships between information and knowledge processing entities and even people, groups, organizations, computers (Bozkurt *et al.,* 2015). Based on this definition, the main goal of SNA is "*detecting and interpreting patterns of social ties among actors*" (De Nooy, Mrvar and Batagelj, 2011, p. 5). A widespread SNA tool is Visualization of Similarities (VOS) (van Eck and Waltman, 2010; 2013; 2014). The VOSviewer visualizes SNA data in various ways to emphasize different aspects of the literature production in this study, VOSviewer Version 1.6.2 used to create landscapes in which keywords are colored the keywords 's appearance in the scientific literature. As mentioned earlier, for the purpose of this study, the most important keywords which are used in our sample were recognized and relationships of top used keywords (nodes) were identified. Then these nodes were tied to each other by using VOSviewer) (van Eck and Waltman, 2010; 2013; 2014) as SNA software. Following that, the raw data was visualized applying centrality measure analysis.
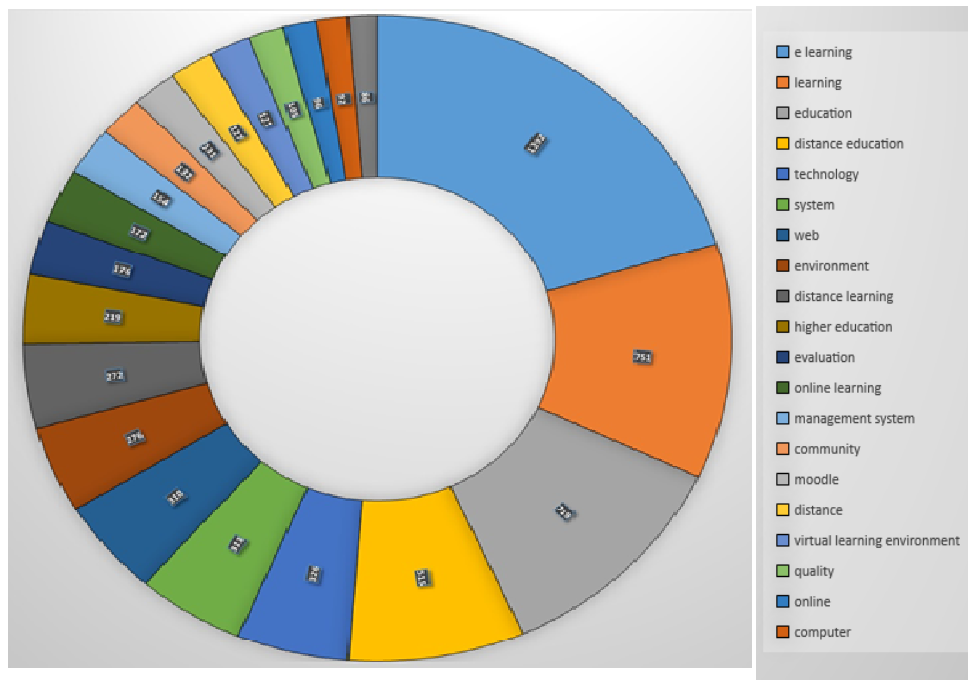
Fig.4. Top 40 keywords indicated more often than others (N=7113)
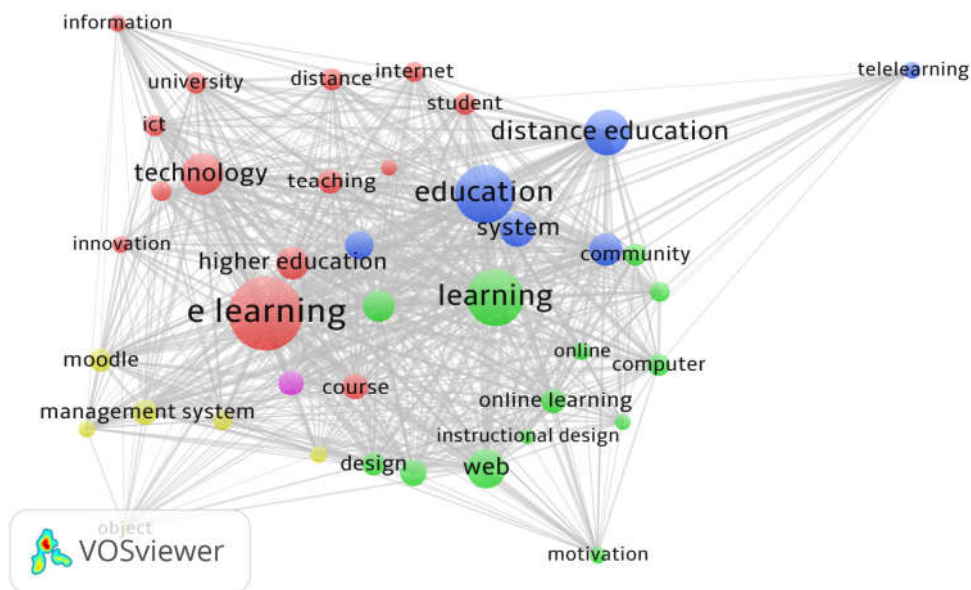

Fig. 5. Keywords network

As a result of this analysis, 40 nodes and 672 ties (edges) were observed. Analyze the data displayed that keywords such as "e-learning", "learning" and "education" appeared as crucial nodes. Fig.5 shows that as the circle gets bigger, the importance of keyword will enhance also. Further, the ties display the strength of connection between keywords which is used in articles. The finding of this analysis confirms perivous studies findings such as Zawacki-Richter and Anderson (2014) and Bozkurt *et al.,* (2015). They also found that the majority of published research deals with topics and issues with regard to "teaching" and "learning" in distance education.

Characteristics of countries: To provide a comprehensive picture of distance education research across different countries, Fig.6 specifies various countries based on total number of citations that articles from each country have received. Hence, with regard to the distribution of nationalities of the 6141 papers indexed for this research, top rated nations with the most publications catalogued in WoS database during 1987-2016 are elicited, as illustrated in Figure 6. According to the statistics, the United States outnumbers all the other nations in terms of number of papers, with a total of 926 papers (15,097%) retrieved. It is then followed by England (526 papers; 8.565), Romania (386 papers; 6.286), Spain (379 papers; 6.172), China (374 papers; 6.09), Taiwan (292 papers; 4.755), Australia (256 papers; 4.169), Turkey (200 papers; 3.257), Canada (199 papers; 3.241) and Germany (169 papers; 2.752).
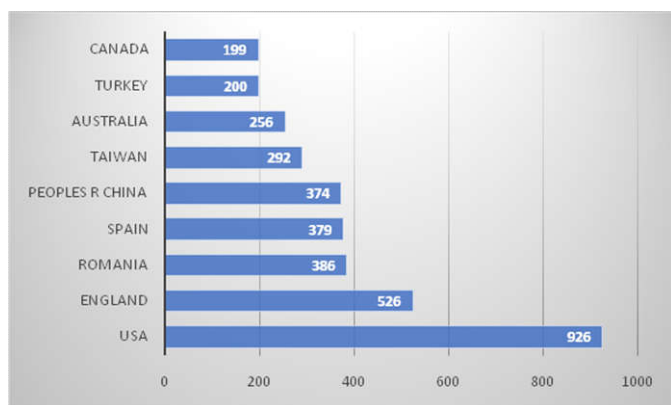
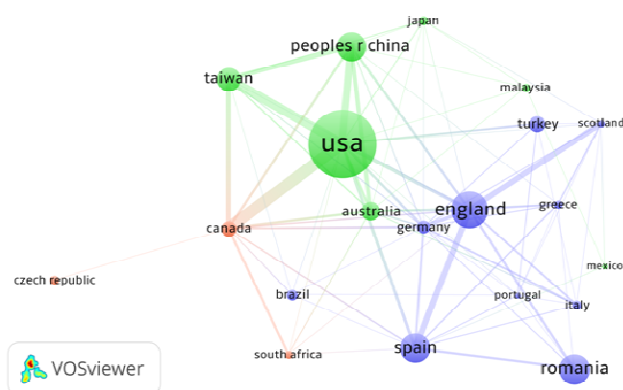**Fig. 6. Distribution of Top 10 productive country**

Fig. 7. Co-authorship collaboration between the 20 most collaboration intensive countries

Fig. 7 presents the co-authorship collaboration between countries. Collaboration was identified between 118 countries and the 20 most connected countries are shown in Fig. 7. The USA is far the most active in co-authorship collaboration (seen from the size of the circle), while they collaborate with several countries. As the figure shows, the frequency of co-authorship collaboration with each country is evident from the thickness of the line, meaning that the USA collaborates most intensively with Canada, the People's Republic of China, Taiwan and UK (England). Similarly, the UKis also quite active in co-authorship collaboration. As figure shows, the collaboration is concentrated all around the world and countries such as Spain, Romania, Germany and Scotland collaborate very intensively with England. In contrast, some countries, like Czech Republic, Mexico, Malaysia, South Africa and Brazil, are showing a smaller number of co-authorship collaboration (1 to 6).

In addition, Australia and Taiwan favored cooperation with the People's Republic of China. Thus, the result shows that most important countries have close collaboration with China.

DISCUSSION

Distance learning environments make intensive use of information and communication technologies (ICTs) to underpin the delivery of basic higher education institution functions and are a characteristic feature of today's educational context. The spread of distance learning and of competence in this field has given rise to growing concerns about the quality of this service (Jesús and Per-, 2013). However, it is essential to conduct qualitative and quantitative research for enabling curriculum developers, instructors, and instructional designers

to come up with advisable strategies to create a more conducive learning environment and provide a way to determine the future success of students in the online environment (Gebara, 2010). Therefore, by combining quantitative, qualitative, and graphic techniques, educators can not only address comparability issues, but also can increase our knowledge about teaching in distance education courses (Schoech and Helton, 2002). Accordingly, the purpose of our study was to conduct a qualitative and quantitative analysis on distance education to reveal research trends and issues in distance education emerging from scholarly publishing in WoS database. This study intends to present past and current situation and provides a research direction for future research. However, after conducting a comprehensive search process, we found 6141 relevant articles.

Then following prior studies (e.g., Akhavan *et al.,* 2016), the researchers focused on the most influential studies and conducted our core analysis on the 500 most cited articles. From the results of this study we can assume that, the number of citations has a positive and significant relationship with number of pages of the articles in our sample but we did not find any significant relationship between journals DOI and number of citations. In addition to these results, years between 2004 and 2015 have witnessed the highest number of publication and citation in distance education articles. Moreover, two top ranked institutions belong to UK and USA with records of publication and the most published papers based on subject area relate to education and educational research followed by computer science. Finally, the most published authors who have been presented in Table 2 are Richardson JTE and Deeson E. The novelty of our study is using the application of VOSviewer) (van Eck and Waltman, 2010; 2013; 2014) to conduct analysis of most frequently used keywords in the articles. A holistic analysis of these keywords through social network analysis demonstrates that "e-learning" is the major topic in the field naturally. Then "learning" and "education" appeared as important keyword used in distance education articles. Further, as illustrated by Table 4, only a small number of articles in our samples are review (46, 0.75%). In contrast, high number of publications belong to proceeding (3597) and article (2091). Another issue which analyzed with this application is the characteristics of countries based on number of citations and then co-authorship collaboration between countries. The results show that developed countries such as US and UK produce the majority of highly published papers of distance education, also these two countries are the most active countries in co-authorship collaboration.

In this respect, USA collaborates most intensively with Canada, China, Taiwan and UK. Additionally, Spain, Romania, Germany and Scotland collaborate very intensively also with UK. Additionally, Spain, Romania, Germany and Scotland collaborate very intensively with UK. Several limitations of this study can be identified to help drive future research. First, we drew our sample from WoS to enhance the quality and reliability of studies but there are other sources and outlets that have been growing in recent years and are not indexed by WoS. In fact, several distance education journals such as MERLOT Journal of Online Learning and Teaching have not been indexed by WoS. Therefore, in order to create consistency and enhance the quality of studies included in our sample, we might have missed several distance education specific outlets. Second,

we only focused on 500 most cited papers in our analysis. If we include more studies the result, which is a viable venue for future studies, may be changed. Third, while we identified the relationships between some characteristics of the studies and number of citations that they have received, we, by no means, argue for a causation relationship. Future studies using primary data from distance education scholars can investigate what characteristics lead them to cite an article and compare the results with those of our study to uncover the true causal relationships. However, with knowledge of the past and present data of distance education, the researchers and practitioners would be able to foresee the future.

REFERENCES

Akhavan, P., Ale Ebrahim, N., Fetrati, M. A., and Pezeshkan, A. Major trends in knowledge management research: a bibliometric study. *Scientometrics,* 2016; 107(3): 1–16.

Ale Ebrahim, N., Salehi, H., Embi, M. A., Habibi, F., Gholizadeh, H., Motahar, S. M., and Ordi, A. Effective strategies for increasing citation frequency. *Journal of International Education Studies,* 2013; 6(11): 93-99.

Allan, M. A Peek into the Life of Online Learning Discussion Forums: Implications for Web-based distance learning, The *International Review of Research in Open and Distributed Learning,* 2004; 5(2).

Allan, M. A Peek into the Life of Online Learning Discussion Forums: Implications for Web-based distance learning.The *International Review of Research in Open and Distributed Learning,* 2004; 5(2).

Boston, W., Diaz, S. R., Gibson, A. M., Ice, P., Richardson, J., and Swan, K. An exploration of the relationship between indicators of the community of inquiry framework and retention in online programs. *Journal of Asynchronous Learning Networks,* 2010, 14(1): 3-18.

Bozkurt, A., Ozbek, E. A., Yilmazel, S., Erdogdu, E., Ucar, H., and Guler, E. Trends in Distance Education Research: A Content Analysis of Journals 2009 -- 2013. *The International Review of Research in Open and Distributed Learning,* 2015; 16(1):1–19.

Chahino, Michael. An exploration of student personality type and success in online classes. Dissertation, Northern Illinois University, United States, 2011.

Cheng, B., Wang, M., Mørch, A. I., Chen, N. S., Kinshuk, and J. Michael, S. Research on e-learning in the workplace 2000-2012: A bibliometric analysis of the literature. The Journal of Educational Research Review, 2014; 11, 56–72.

Daniel, J. Dual-mode universities in higher education: Way station or final destination? Open Learning. *The Journal of Open, Distance and e-Learning,* 2012; 27(1): 89-95.

De Nooy, W., Mrvar, A., and Batagelj, V. 2011. Exploratory social network analysis with Pajek (Vol. 27). Cambridge University Press.

Ellis, D. A behavioral approach to information retrieval system design. Journal of Documentation, 1989; 45(2): 171–212.

Ellis, D., and Haugan, M. Modelling the information seeking patterns of engineers and research scientists in an industrial environment. *Journal of Documentation*, 1997; 53: 384–403.

Falagas, M. E., Zarkali, A., Karageorgopoulos, D. E., Bardakas, V., and Mavros, M. N. The impact of article length on the number of future citations: a bibliometric analysis of general medicine journals. PLoS ONE, 2013; 8(2): e49476.

Ferguson, J. M., and DeFlice, A. E. Length of online course and student satisfaction, perceived learning, and academic performance. *International Review of Research in Open and Distance Learning,* 2010; 11(2):73-84.

Freitas, F. A., Myers, S. A., Avtgis, T. A. Student perceptions of instructor immediacy in conventional and distributed learning classrooms. Communication Education, 1998; 47(4): 366-372.

Gebara NL. General self-efficacy and course satisfaction in online learning: A correlational study. *Dissertation, University of Missouri-Columbia,* 2010.

Glassmeyer, D. M., Dibbs, R. A., Jensen, R. T. Determining utility of formative assessment through virtual community: Perspectives of online graduate students. The Quarterly Review of Distance Education, 2011; 12(1), 23-35.

Harasim, L. Shift happens: Online education as a new paradigm in learning. *The Internet and Higher Education,* 2000; 3(1): 41–61.

Lei, S. A., and Gupta, R. K. College Distance Education Courses: Evaluating Benefits and Costs from institutional, faculty and students' perspectives. Education, 2010; 130(4): 616-632.

Liyanagunawardena, T. R., Adams, A. A., and Williams, S. A. MOOCs: a systematic study of the published literature. The *International Review of Research in Open and Distributed Learning,* 2013; 14(3): 202–227.

Macon, D. K. Student Satisfaction with Online Courses versus Traditional Courses: A Meta-Analysis. Dissertation, Northcentral University, 2011.

Means, B., Toyama, Y., Murphy, R., Bakia, M., and Jones, K. Evaluation of Evidence-Based Practices in Online Learning. Structure, 2009; 15(20): 1-94.

Ming, H. W., Hui, Z. F., &Yuh, S. H. Comparison of universities' scientific performance using bibliometric indicators. *Malaysian Journal of Library & Information Science,* 2011; 16(2):1–19.

Schoech, D., and Helton, D. Qualitative and Quantitative Analysis of a Course Taught via Classroom and Internet Chatroom. Qualitative Social Work, 2002; 1(1), 111–124.

Schulte, M. The foundations of technology distance education: A review of the literature to 2001. *The Journal of Continuing Higher Education,* 2011; 59(1), 34-44.

Shea, P., Vickers, J., and Hayes, S. Online instructional effort measured through the lens of teaching presence in the COI framework: A re-examination of measures and approach. *International Review of Research in Open and Distance Learning,* 2010; 11(3), 127-154.

Simonson, M., and Schlosser, C. Distance education research: a review of the literature, 2011:124–142.

Stein, D. S., Wanstreet, C. E., and Krisch, C. Distance Education Research in Adult Education Journals: A Content Analysis. In Proceedings of the Midwest Research to Practice Conference in Adult, Continuing, and Community Extension Education. Lindenwood University, 2011:21-23.

Tallent-Runnels, M. K., Thomas, J. a., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., and Liu, X. Teaching Courses Online: A Review of the Research. Review of Educational Research, 2006; 76(1):93–135.

Van Eck, N. J., and Waltman, L. VOSviewer manual, Univeristeit Leiden, Leiden, 2013.

Van Eck, N.J., and Waltman, L. Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 2010; 84 (2): 523 – 538.

Van Eck, N.J., and Waltman, L. Visualizing bibliometric networks. Measuring scholarly impact. *Springer International Publishing,* 2014; 53(2): 285 – 320.

Zancanaro, A., Todesco, J. L., and Ramos, F. A bibliometric mapping of open educational resources. *International Review of Research in Open and Distance Learning*, 2015; 16(1):1–23.

Zawacki-Richter, O. Research areas in distance education: A Delphi study. *The International Review of Research in Open and Distance Learning*, 2009; 10(3):1–17.

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