MAJOR TRENDS AND CHALLENGES IN ONLINE DISTANCE LEARNING RESEARCH IN DEVELOPING COUNTRIES. A SYSTEMATIC REVIEW

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Massive Open and Online Courses (MOOCs) systems are fast emerging mechanisms to offer various academic program rang from certificate level to highest degree such as Doctor of Philosophy. These systems gain considerable popularity after the COVID-19 Pandemic. The vendors of these systems converted it highly valuable business using different market strategies. However, developing countries are facing several challenges to effectively utilize these systems for their educational system. Therefore, this explore the challenges and barriers which are the main hurdles that these systems are not effective. The main focus of the paper is on the research of the challenges and barriers in field of online distance learning (ODL) research among developing countries catalogued in Web Sciences, Scopus databases during 2017-2022. Mainly bibliographic description and social network analysis was employed to investigate the structure and pattern of information exchanged with the field of ODL research in developing countries and also to interpret the interrelationship between the keywords indicated in these articles. A total of 100 most cited articles were reviewed to examine the impact of factors such as journal DOI and keywords on the number of citations that they received. About 4 research articles were not retrieved from the course destination. We also identified major trends in online distance learning towards challenges and barriers education literature 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 the developing countries. Our results show that the most cited articles are from countries of India, Pakistan, and South Africa and the most prolific years in terms of number of published articles and citations are 2021. We also found non-significant and very small correlation between the number if citation and DOI number of journals. This study would advantage to reader as resource for future studies by indicating how trends and challenges in online distance learning in developing countries research have a great significance.
Keywords: ODL, MOOC, Online distance learning, Developing Countries, online learning,

INTRODUCTION

The perquisite of the ODL types of models is Web-based technology which has proven itself indispensable in education, especially in ODL and in developing countries. Web technology is generic term used for system where online interaction is required. There are different forms of this technology and various kind of usage for ODL and online research activities. Many countries (developing) countries have produced outstanding results but limited in scope as compared the usage of this technology for education in the developed world. based Since 2002, open education resources have been introduced in the United Nations Educational, Scientific and Cultural Organization's forum on open courseware (Chiu, 2016; Daradoumis, Bassi, Xhafa, & Caballe, 2013). The forum has provided educators worldwide with a wide range of opportunities to improve the quality of education and facilitate better learning amongst their students. This has also allowed the designing of open license learning in any media format, which could be placed in the public domain, can be easily accessed, are free to use, and/or with limited restrictions. (Boonrounfrut, Saroinsong & Kim, 2022). In this century, the technology has influenced changes in different fields where education is not exceptional where dramatic changes were brought because of the usage of technology 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, online distance learning 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 online distance learning as capable of providing equal or superior learning experiences compared to those from traditional classroom instruction (Chahino, 2011).

Therefore, online distance learning 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.*, 1998). 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). (Amoozegar, khodabandelou & Ebrahim, 2018).

Many converging words or sub-fields of e-learning in higher education included distance learning, distance learning, interactive learning, online learning, virtual learning, computer-based learning, digital learning, and blended learning (hybrid learning). (Brika, Chergui, Algamdi, Musa & Zouaghi, 2022).

The concept of e-learning, although widely known has not yet been fully explored (Nicholson, 2007). Many countries designed and deployed online distance learning systems during the COVID-19 pandemic to ensure that higher education could continue without interruption (Tesar, 2020). (Brika, Chergui, Algamdi, Musa & Zouaghi, 2022).

ODL is 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 online distance learning, 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). (Amoozegar, khodabandelou & Ebrahim, 2018).

Through the application of quantitative and qualitative analysis, this paper provides a mapping of publications related to ODL, 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 (Ming, Hui and Yuh, 2011).

When looking at the scientific studies published during the COVID-19 pandemic, it shows clearly that many international journals have published a large number of academic articles about e-learning in higher education during COVID-19 (Karakose and Demirkol, 2021). Furthermore, a vast amount of bibliometric research has been carried out in this field. However, there is very little research focused entirely on the relationship between e-learning, higher education, and COVID-19, using scientometric or bibliometric analysis (Furstenau et al., 2021).

Literature review analyses have been vastly adopted by prior studies in online distance learning 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 2012 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 online distance learning 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/online distance learning (Means, Toyama, Murphy, Bakia, and Jones, 2009).
Although, all of these studies enhance our understanding of online distance learning 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 Online distance learning (AJDE) dedicated to DE studies, there is a need to mirror the online distance learning field to be able to understand and interpret the new dynamics, namely online distance learning trends (Bozkurt, Akgun-Ozbek, *et al.*, 2015). Therefore, this study intend to explore the current trends in the field of online distance learning research in developing countries during the period of 2017-2022 by an extensive review of SCOPUS and Web of Science (WoS) Core Collection , which is a structured database that indexes selected publications from various disciplines (Akhavan *et al.*, 2016) keeping in view the above discussion, this paper will discuss bibliometric indicators for online distance learning in higher education proceed with a network analysis to define the most important sub-areas in this topic. It is understood that there is great desire of the educationists in the developing countries to use ODL, online research and other systems but they lack to know the trend in this regard. To define the trends of ODL in developing countries, the following questions are proposed:
Q1: What are the most important sub-fields of distance learning in light of developing countries?
Q2: What are the most recent trends and challenges in the subject of online distance learning in light of developing countries?
Q3: What developing countries are the most referenced for research on the subject of online distance learning?

Methodology
A systematic literature review of peer-reviewed academic papers was conducted with searches from two academic database- Educational Resource Information Centre (ERIC), Scopus and Web of Science. The purpose of this systematic review was to identify and present empirical evidence from the existing literature (Pham et al. 2014) of the way in which trends are identified in distance learning and online distance learning in developing countries. The research purposefully selected academic journals papers based on the inclusion and exclusion criteria. (Table 1)

Table 1: Inclusion and exclusion criteria

Inclusion Criteria	Exclusion Criteria
Published 2017 to 2022	Published before 2017
Papers published in English only	Papers in languages other than English
Primary empirical research	Reviews or theoretical articles
Journal articles, full- text, open access, peer reviewed	Grey literature, blogs, fee-based papers, newspapers, books, etc.
Developing countries	Developed Countries
Higher education (University, college, tertiary)	Not basic education (high school, primary school education, corporate and training, technical and vocational education
Online distance learning (E-learning, M-learning, Blended learning)	Face to face education, in person education, on campus education
Educational E-portfolios	Non-educational, e.g. professional development portfolios, showcase portfolios

Data Sources
The Scopus and Web of sciences are a world-class research platform that enables the discovery, analysis, and sharing of knowledge in the sciences, social sciences, arts, and humanities. The Scopus and WOS databases contribute to the efficiency and effectiveness of the research workflow. The Scopus and WOS databases were preferred because it indexes the leading journals in the field of education and provides appropriate data for systematic analysis. The Scopus, WOS databases were used to find relevant studies. Different keywords were preferred, and the most comprehensive search was performed. An online search was performed on the Scopus and WOS databases website. “Online formative”, “e-assessment”, and “higher education” were chosen as search keywords. Then, some restrictions such as language were applied. Finally, the following search term was applied.

TITLE-ABS-KEY (("online distance learning" AND "online distance learning "AND "online learning "AND "E learning") AND ("higher education" OR "university")) AND (LIMIT-TO (LANGUAGE, "English")) AND (EXCLUDE (PUBYEAR, 2023)).

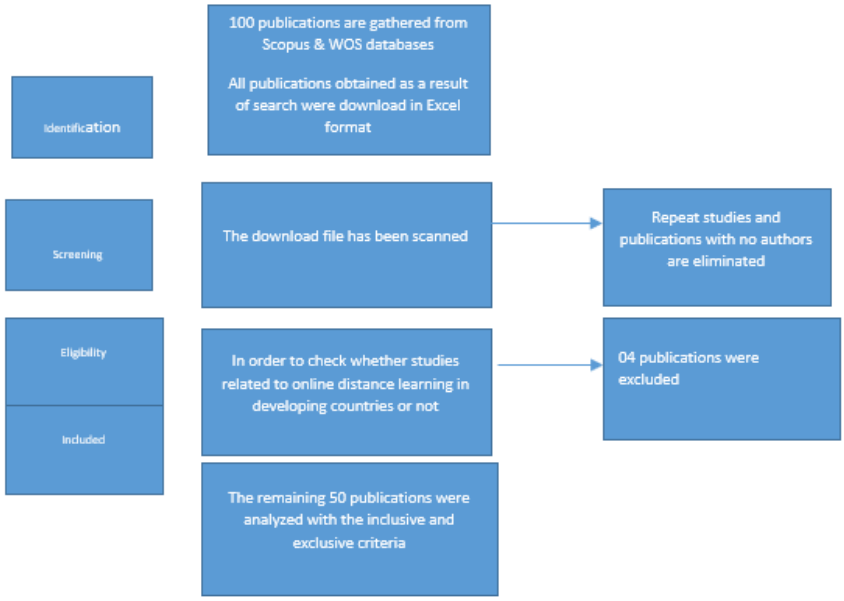

Figure 1. Flow Diagram for Systematic Search.

Because the publications for 2023 were not completed, they were omitted from the scope of the searches. The requirement that the publication be in English has been added. In total, 100 publications were discovered as a result of the search (as shown in Figure 1). The Scopus database was queried for publication data in excel format. To begin, articles without author or publication year were eliminated from the data. Later, it was investigated for repeated articles, and the others were removed. There were various instances in book publishing, depending on the volume of books published each year. New publications were deleted based on the citation information. If a publication was simultaneously published as a congress paper and an article, the article was preferred. Finally, by studying the titles, it was determined whether there were any publications that were unconnected. At the conclusion of the exclusion, there were 100 broadcasts.

Table 2. Overall challenges reported in review papers

Authors (date)	Identified Challenges	Country
Hoti I., Dragusha B., Ndou V. 2022	digital skills, Technical skills, Technical support, technology, teaching techniques, age & gender issues	Albania
Gama L.C., Chipeta G.T., Chawinga W.D. 2022	underdeveloped ICTs, power infrastructure, e-learning policy and lack of knowledge to use	Malawi
Shambour M.K.Y., Abu-Hashem M.A. 2022	general specialization, academic degree, teaching country,	Malaysia Saudi
Mudau P.K., Modise M.-E.P. 2022	technical support and relevant continuous training on the design	South Africa
Al Ghazali F. 2022	technical infrastructure, technical training to optimize the technical resources	Saudi UAE

Sofi-Karim M., Bali A.O., Rached K. 2022	electricity, electronic devices, and the absence of required skills	Iraq
Modise M.-E.P., Mudau P.K. 2021	E portfolio for meaningful learning and learner support	South Africa
Hou L., Liu Q., Nebhen J., Uddin M., Chaudhary A. 2022	problems in the existing prototypes	Pakistan Nepal
Gismalla M.D.-A., Mohamed M.S., Ibrahim O.S.O., Elhassan M.M.A., Mohamed M.N.E. 2021	slow internet, technical support, in person interaction, technical support, time flexibility, online exam	Sudan
Yilmaz Y., Sarikaya O., Senol Y., Baykan Z., Karaca O., Demiral Yilmaz N., Altintas L., Onan A., Sayek İ. 2021	online support, upgrade the course contents	Turkey
Li W., Gillies R., He M., Wu C., Liu S., Gong Z., Sun H. 2021	facilitating factor, technical support, technical issues, slow bandwidth, connectivity,	China
Shahriar S.H.B., Arafat S., Sultana N., Akter S., Khan M.M.R., Nur J.M.E.H., Khan S.I. Ali S., Hafeez Y., Abbas M.A., Aqib M., Nawaz A. 2021	technological infrastructure development, limitation to devices or internet accessibility and finances tutors and students have no experience and familiarity with remote learning	Bangladesh Pakistan
Adarkwah M.A. 2021	lack of funds, infrastructure, effective e-learning systems, ICT Gadgets	Ghana
Nasir S., Hameed M. 2021	network problems, unavailability of modern gadgets like computers or smartphones	Pakistan
AlKhamaiseh O.S. 2021	electronic environment	Jordan Amman
Tsekea S., Chigwada J.P. 2021	poor connectivity, librarians lack resources and the technical expertise to support e-learning activities	Zimbabwe
Singh H.K., Joshi A., Malepati R.N., Najeeb S., Balakrishna P., Pannerselvam N.K., Singh Y.K., Ganne P. 2021	low-cost gadgets (desktops/laptops/Wi-Fi routers), broadband internet services, ICT technology training	India
Boothby D.N., Hart A., Chandler H., Dupuy D.	digital divide, financial instability and inattention to learning adjacent needs such as nutrition	Haitian

Sigdel S., Ozaki A., Dhakal R., Pradhan B., Tanimoto T. 2020	lack of infrastructure, well-trained educators, and advanced technologies—the abrupt changes in methods	Nepal
Posever N., Sehdev M., Sylla M., Mashar R., Mashar M., Abioye A. 2021	Internet connectivity, resources expanses	Nigeria
Rajan D., Pillai V.G., Varghese P. 2021	Privacy, limited resources and limited training opportunities	India
Chukwuemeka E.J., Dominic S., Kareem M.A., Mailafia I.A. 2021	low internet bandwidth, high internet cost, absence of internet service and wireless infrastructures	Nigeria
El Said G.R. 2021	technological infrastructure, responsive troubleshooting services, robust communication channels	Egypt
Habib M.N., Jamal W., Khalil U., Khan Z. 2020	limited support to the large file size, real time learning, online classes, real time feedback and query system	Pakistan
Mohan M.M., Upadhyaya P., Pillai K.R. 2020	lack of internet access, resources, and lack of interaction with faculty	India
Villanueva M.E., Camilli E., Chirillano A.C., Cufré J.A., De Landeta M.C., Rigacci L.N., Velazco V.M., Pighin A.F. 2020	lack of good Internet connectivity, lack of interaction with their teachers	Argentina
Ahmed A.E., Awadallah A.A., Tagelsir M., Suliman M.A., Eltigani A., Elsafi H., Hamdelnile B.D., Mukhtar M.A., Fadlelmola F.M. 2019	location and timing logistics, timing	Africa
Bokayev B., Torebekova Z., Abdykalikova M., Davletbayeva Z. 2020	policy gaps while implementing distance learning	Khagistan
Wilches F.J., Díaz J.J.F., Avila R.H. 2020	low internet speed, which results in poor connectivity, low purchasing power	Colombia
Alshurideh M., Salloum S.A., Al Kurdi B., Monem A.A., Shaalan K. 2019	user-friendliness, easy accessibility and reliability	UAE
Exploring our oceans: Using the global classroom to develop ocean literacy 2019		South Africa
Latchem C. 2019	Access, use of and impact of ICT	South Africa

Mabuan R.A. 2019	increasing, costs, lack of resources, and busy schedules,	Philippine
Ahmed S.S., Khan E., Faisal M., Khan S. 2017	better electricity and Internet connectivity could be very useful for the rural areas	Pakistan
Wright B.M. 2017	difficulty in obtaining strong Internet connections	Malaysia
Panda S., Santosh S. 2017	free of cost; there is a strong need for training on intellectual property rights, copyright, and creation and use of OER	India
Corlett J., Martindale L. 2017	limited connectivity and internet access	Africa

Results

The first trend that we describe is the time of ODL publications in our sample. Table 3 and Figure 1 present the number of articles on online distance learning published in each year from 2017 to 2022 in developing countries. The bar chart and the interpolation line on the bars show that the number of articles on ODL continued to increase in general, and the field was growing and attracting more research interest, especially during 2022. During the study period, the cumulative number of articles grew from 1 in 2017 to 15 in 2021. The number of publications in 2021 accounts for 10% of the entire sample.

Table 3: Number of published papers in online distance learning in developing countries

SNO	Publication year	Number of Articles
1	2017	04
2	2018	0
3	2019	04
4	2020	07
5	2021	14
6	2022	07

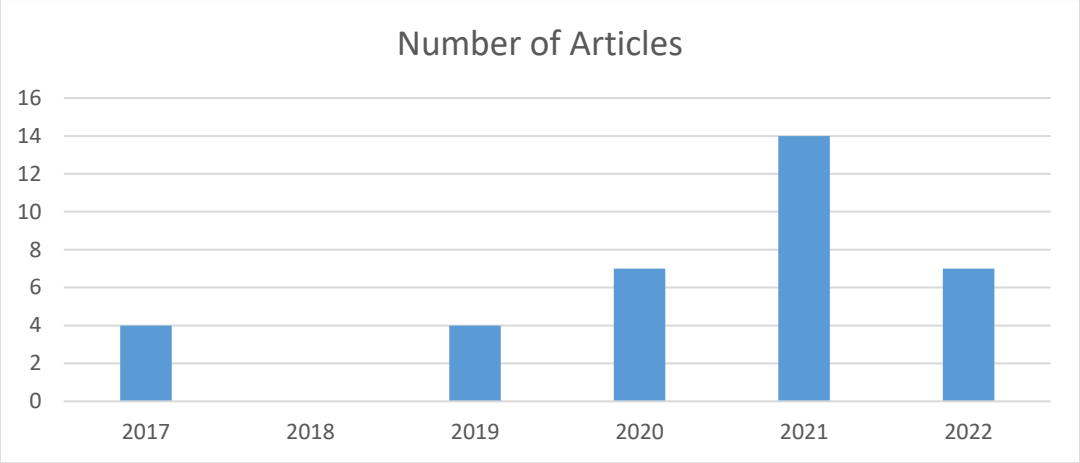

Figure 2.

However, it appears that online distance learning has received much attention from researchers, which leads to a rapid growth of related papers as illustrated in figure 1. According to numerical data, a large amount of research papers published in developing countries in 2020 -2022 have been catalogued in the web of sciences and Scopus databases.

Table 4: The top published papers on online distance learning in developing countries based on countries.

SNO	Country Name	Most Articles Published
1	South Africa	04
2	Pakistan	04
3	India	04
4	Saudi	02
5	Nigeria	02
6	Haitian	02
7	Malaysia	02

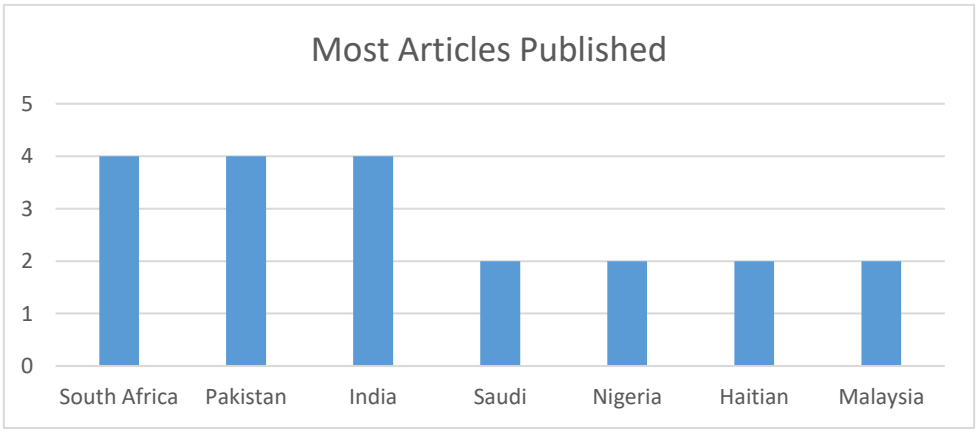

Figure 3.

Characteristics of Countries: To provide a comprehensive picture of ODL research across different countries, Fig 5 specifies various countries based on total number of articles from each country have received. Hence with regard to the distribution of nationalities of the 100 papers indexed for this research , top rated nations with the most publications catalogued in Scopus and WOS databases during 2017-2022 are elicited, as illustrate in fig. According to statistics the three developing countries Pakistan, India and South Africa out numbers all the other developing nations in terms of number of papers, with a total of 04 each papers retrieved. It is then followed by Saudi, Nigeria, Malaysia and Haitian with 02 number of articles each.

Table 5: The top ranking of published papers in online distance learning based on subject areas.

Rank	Subject Area	Count
1	Education & Information Tech	06
2	Computer Sciences	01
3	Engineering	0
4	Information Sciences & Library	0
5	Social Sciences	07
6	Health Care Sciences Services	09
7	Business Economics	0
8	Psychology	0
9	Telecommunication	02

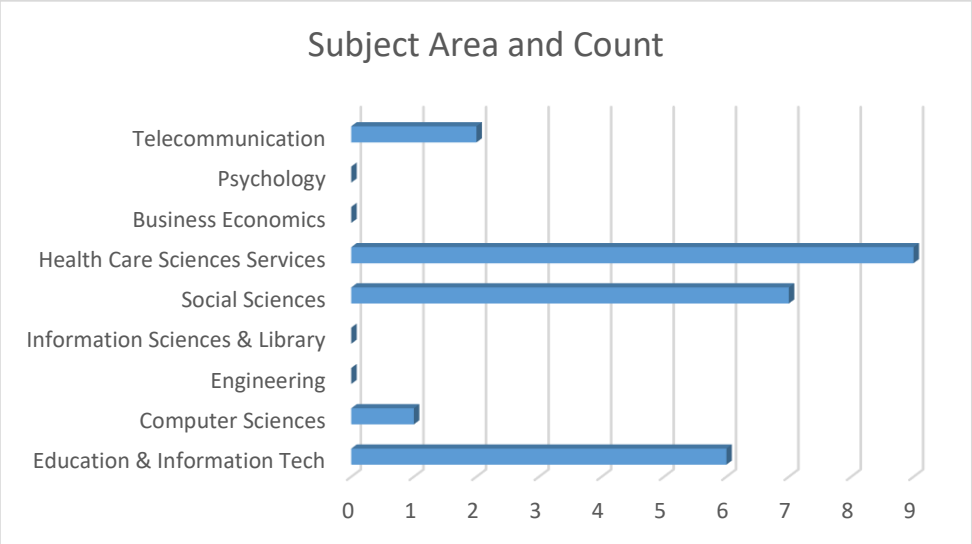

Figure 4.

Conclusion

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 in the educational context today. 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). The paper reported on systematic review of peer-reviewed academic studies of trends and challenges of ODL in developing countries between 2017 and 2022 outlining the way in which online distance learning could effectively be used as a tool for teaching and supporting learning in higher education. Inclusion and exclusion criteria were sued to select the studies from developing countries. The included studies strongly concur on the trends and challenges of online online distance learning and

listed many benefits using ODL as a teaching and support tool. However, most of the identical challenges are generic.

The 100 reviewed articles include various recommendation for the use of ODL mostly mentioning the Connectivity, security, reliability, Internet connection, bandwidth, training and support and technical knowhow as key to the successful implementation of online distance learning. Training and resources are to equip both instructors and students with relevant sKills that motivate them and pave the way towards smooth adoption and use of online distance learning in developing countries. Availability of resources, government support, network availability in remote areas on nominal rates and introductory training workshops are especially beneficial for students and should effectively be conducted at the beginning of online distance learning programs and courses. Instructors also requires training and continuous support to enhance their online distance learning teaching skills.

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