

Analysis of The Turkish Online Journal of Distance Education Through Text-Mining

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Abstract

This paper presents a review of distance education literature published in the Turkish Online Journal of Distance Education (TOJDE) to describe the status thereof and to identify gaps and priority areas in distance education research based on a validated classification of research areas. The articles (N=784) published between 2000 and 2015 were reviewed for this study. Accordingly, computer-assisted content analysis revealed that “the rise of ICT and e-learning (2000-2003)”, “the increasing use of educational technologies in distance education (2004-2007)”, “technology supported online/virtual learning environments (2008-2011)”, and finally “the rise of the student centered, technology supported education and data-driven approaches (2012-2015)” were major themes in articles published in TOJDE.

Keywords: Turkey, distance education, research trends, systematic review, bibliographic analysis

Introduction

Taking advantage of previous experience and then using it as guide provides a robust walkthrough for those who want to move forward and improve the field. In this regard, analyzing, understanding and then synthesizing research trends in Distance Education (DE) forge the current state of the art and help it to develop further. Similarly, Lee, Driscoll and Nelson (2004) emphasize that "understanding trends and issues in terms of topics and methods is pivotal in the advancements of research on distance education" (p. 225). The structure of a research discipline forms the foundation for identifying gaps and priority areas (Mishra, 1997, p. 281). According to Bozkurt and Akgun-Ozbek, (2015), identifying the research areas is important because they act like a compass for online distance education researchers. They further highlight that distance education is a dynamic, interdisciplinary field that reacts to the changes swiftly; therefore, it is vital to keep the knowledge up to date through research on global, local or glocal dimensions. In this regard, analyzing, understanding and then synthesizing research trends in Distance Education (DE) forge the current state of the art and help it to develop further. In this regard, this paper addresses following research questions with a special emphasis on Turkish distance education research:

- What are the most common research areas covered in TOJDE and where are there gaps in distance education research?

Literature Review

Latchem (2009) conducted a content analysis of articles published in TOJDE between 2000 and 2008. He reported that articles originated from the Asia followed by articles from the Middle East, Africa, South America, USA, Eastern and Western Europe, and Australia. He highlighted that TOJDE is an important source to better understand the non-Western perspectives in distance education field. Özarlan, Balaban-Sali and Demiray (2012) analyzed the articles in TOJDE published between 2000 and 2010. They reported that Turkey, USA, India, Nigeria, Malaysia, Pakistan, Australia, Canada, UK, Bangladesh, Greece, and Iran, respectively, are the leading contributors. Bozkurt, Zawacki-Richter and Aydin (2019) conducted social network analysis to identify keyword network patterns and revealed that technology centric views widely accepted in the articles published in TOJDE. Aydin, Zawacki-Richter and Bozkurt (2020) conducted a follow up study and reported that as an international open access journal, TOJDE is representative of its own region, mostly developing countries, and is also representative of many other countries, which makes it an important publication venue.

In addition to above studies, there are some other papers that examine distance education from the perspective of scholarly journal networks. For instance, Zawacki-Richter, Anderson, and Tuncay (2010) examined impact of 12 distance education journals (6 open and 6 published in closed format). They found that articles in open access journals, such as TOJDE, tend to be cited more quickly than in closed format journals. Zawacki-Richter and Anderson (2011) analyzed the relationships and influences in peer reviewed distance education journals using social network analysis. In their research, they found that TOJDE is one of the journals in the core of the citation network. Lastly, Perkins and Lowenthal (2015) investigated open access journals in educational technology and reported that TOJDE is one of the most influential open access journals.

There were some other efforts, which were intended to map out trends in distance education research and scholarship by examining journals. For instance, Zawacki-Richter and Naidu (2016) analyzed titles and abstracts of the 515 articles, published in the SSCI journal Distance Education between 1980 and 2014, and they identified seven emerging themes: Professionalization and institutional consolidation (1980–1984), instructional design and educational technology (1985–1989), quality assurance in distance education (1990–1994), student support and early stages of online learning (1995–1999), the emergence of the virtual university (2000–2004), collaborative learning and online interaction patterns (2005–2009), and interactive learning, MOOCs and OERs (2010–2014). Zawacki-Richter, Alturki and Aldraiweesh (2017) examined 580 articles published in International Review of Research in Open and Distance/Distributed Learning (IRRODL) between 2000 and 2015 and they revealed following emerging themes: the establishment of online learning and distance education institutions (2000–2005), widening access to education and online learning support (2006–2010), and the emergence of Massive Open Online Courses (MOOCs) and Open Educational Resources (OER) (2011–2015).

In addition to these studies, some other articles examined distance education journals from a broader perspective and sampled more than one journal in their research. Berge and Mrozowski (2001) examined 890 articles published over a ten-year period from 1990 to 1999. They reported that key issues in distance education were the roles of key participants, technology selection and adoption, design issues, strategies to increase interactivity and active

learning, learner characteristics, learner support, operational issues, policy and management issues, equity and accessibility, and cost/benefit trade-offs. Lee et al. (2004) also examined 383 articles published in four distance education journals between 1997 and 2002. They indicated that that interaction, learners, perception, collaboration, video conferencing, program evaluation, and faculty support were main issues covered in distance education journals. Zawacki-Richter, Bäcker and Vogt, (2009) analyzed 695 articles published in five distance education journals between 2000 and 2008. They found that issues about instructional design, interaction and communication patterns in computer-mediated communication, learner characteristics, and educational technology dominated the distance education field. Bozkurt et al., (2015) conducted a complementary study and examined 861 articles published in seven distance education journals published between 2009 and 2013. They confirmed that educational technology, interaction and communication in learning communities, learner characteristics, and instructional design are the most studied research areas.

Methodology

Research design

This study is a literature review that intends to reach a synthesis by examining articles published in TOJDE. For this purpose, review study benefits from computer-assisted content analysis.

Computer-assisted content analysis

Computer-based content analysis enables us to examine the conceptual structure of text-based information, so it can be used to identify the most important and most commonly occurring themes within large bodies of text (Krippendorf, 2013). This approach is considered to be an appropriate method for mapping out a research domain (Fisk, Cherney, Hornsey, & Smith, 2012). By employing this approach, Leximancer, the software tool creates concept maps that display the core concepts within the text body (conceptual analysis) and show how these concepts are related to each other (relational analysis) by recording the frequency with which words co-occur in the text. Similar concepts that appear in close proximity are clustered together in the concept map (Smith & Humphreys, 2006). In this research, titles and abstracts of the articles published in TOJDE analyzed to identify research themes.

Sample: Articles published in TOJDE

For this study, all the articles published in TOJDE between 2000 and 2015 were reviewed (N=784). Book reviews and editorial notes were excluded from the sample.

Results and Discussion

The Rise of ICT and e-learning (2000-2003)

The major themes emerging between 2000 and 2003 are *distance (100%)*, *learning (23%)*, *study (18%)*, *information (13%)*, *developing (12%)*, *teachers (8%)*, and *process (5%)* (see Figure 4). Developments in ICT and online technologies paved the way of e-learning. Distance education mostly benefited from e-learning model and it is used for facilitating learning processes. Students' perceptions and teachers' views on e-learning, and comparison of traditional courses and online courses were other topics covered in this period.

By the 2000s e-learning was becoming widely accepted and adopted by higher education institutions (Guri-Rosenblit, 2009) and thought to be as an innovative component of the distance education (Bates, 2001). E-learning was further considered as a natural evolution of distance

learning (Garrison and Anderson, 2003). As a reflection to these thoughts, many studies published in TOJDE between 2000 and 2003 dealt with issues concerning ICT and e-learning from the perspective of distance education. This situation can be seen in Figure 4 (see concept path *communication – information – technologies – distance*). As examples of the articles published in TOJDE, Reddy and Srivastava (2003) explained ICT and the future of DE; Rajesh (2003) researched on problems associated with ICT adaptability in developing countries; Edmundson (2003) evaluated ICT in terms of cultural disparity; Flood (2002) suggested that e-learning is a driver for continuing professional development; and Fourmier reported the results of their survey on e-learning in Europe. In this context, students' perceptions and teachers' views were also important themes in this term (See concept path *teachers-research-offered-paper-students-perceptions* in Figure 4). For instance, Nakos and Jourdan (2002) explored students' perceptions of online courses, while Dzakiria and Idrus (2003) examined teacher-learner interactions in distance education.

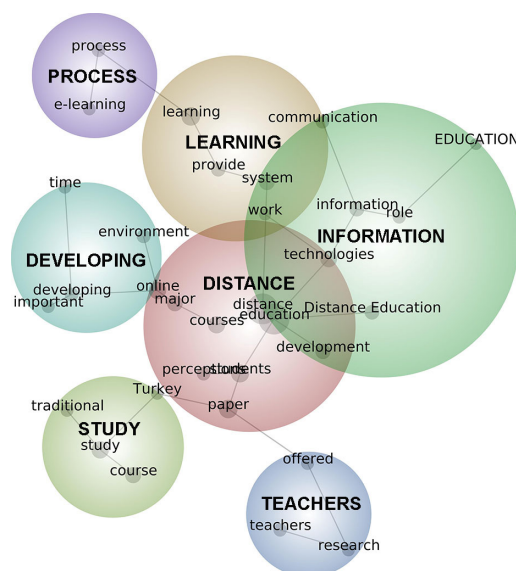


Figure 4: Concept map for the period between 2000 and 2003

The theme, *rise of the ICT and e-learning*, is similar to the themes identified in the journals Distance Education and IRRODL. Zawacki-Richter and Naidu (2016), who examined the journal of Distance Education, labeled the years between 2000 and 2004 as *the emergence of the virtual university* and Zawacki-Richter et al. (2017), who examined IRRODL, labeled the years between 2000 and 2005 as *online learning and distance education institutions*. Based on these findings, it can be concluded that online learning had already moved into the mainstream of distance education by the beginning of the new Millennium.

Increasing use of educational technologies in distance education (2004-2007)

The major theme between 2004 and 2007 was *learning (100%)*, followed by *education (83%)*, *technology (34%)*, *program (16%)*, *training (10%)*, and *group (6%)*. When compared, we can see a strong focus on learning which intersects with all other themes except training (see Figure 5). As identified in the previous period, as a result of the developments in ICT and the great interest in e-learning, educational technologies in distance education attracted much attention. As a field of practice, distance education naturally intended to increase learning opportunities by benefiting from educational technology.

From the beginning of distance education, educational technology and distance education has an intertwined relationship (Casey, 2008). Even though educational technology is not a new area, it has evolved and took many forms (Reeves, 2006). By 2004, Web 2.0 emerged and the nature of online learning spaces changed in line with these developments. Therefore, as an extension of the previous time period, *rise of the ICT and e-learning*, articles published between 2004 and 2007 revisited educational technology to explore new developments from the view of distance education. As can be seen in figure 5, *learning, e-learning, technology, information, technology, and knowledge* concepts are directly linked to each other and demonstrated the direction of research interest in this time period. Some of the noteworthy articles published in TOJDE between 2004 and 2007 are as follows: Ozana (2007) examined attitudes of graduate students on educational technology and distance education. Additionally, it was also seen that among the many educational technologies, there was a focus on Learning Management Systems (LMSs) in the articles published in TOJDE between 2004 and 2007. In their article, Sturgess and Nouwens (2004) evaluated online LMSs from an Australian context, Ahmad, Edwards and Tomkinson (2006) examined use of LMSs in distance learning from a United Kingdom perspective.

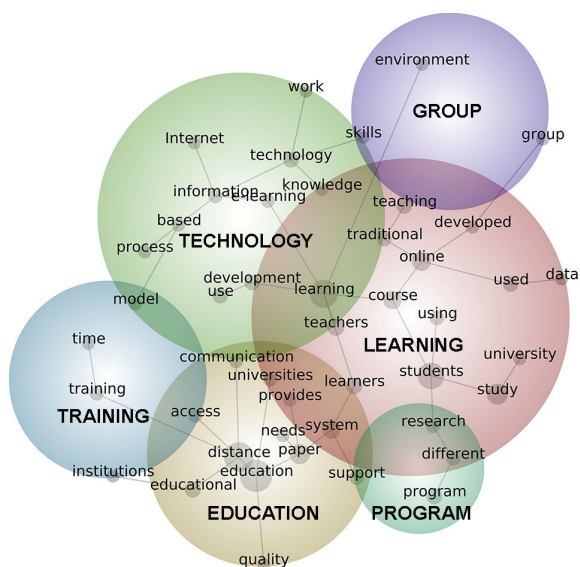


Figure 5: Concept map for the time period between 2004 and 2007

While *an increasing use of educational technologies in distance education* was identified as the main theme for the 2004-2007 period in TOJDE articles, for the Distance Education journal it was *collaborative learning and online interaction patterns* in 2005–2009 (Zawacki-Richter and Naidu, 2016) and *widening access to education and online learning support* in IRRODL for 2006–2010.

Technology supported online/virtual learning environments (2008-2011)

The third theme emerged as an extension of the previous periods. Accordingly, *students (100%), education (88%), learning (74%), academic paper (37%), information (18%), communication (10%) and data (4%)* were the themes identified for the articles published between 2008 and 2011 (see Figure 6). As can be seen in the concept map, higher education institutions used online learning environments to support the learning processes and lessen the limitations of distance education, which is mainly about time and space constraints, by using online spaces in learning processes. As can be seen in figure 6, learning, *distance-learning-*

online-course-environment concepts are directly linked to each other and demonstrated the direction of research interest in this time period. We also see that *data* emerged as one of the major themes, which then became very critical in the following period. The interest online/virtual environments stem from one of the popular online/virtual environment, SecondLife at this time period and 2011 issues mostly published articles about online/virtual environments and worlds. For instance, in their study, Inman, Wright and Hartman (2011) evaluated use of Second Life from the perspective of K12 and higher education; Liski (2011) examined Second Life for training design, and Hargis evaluated Second Life for distance education.

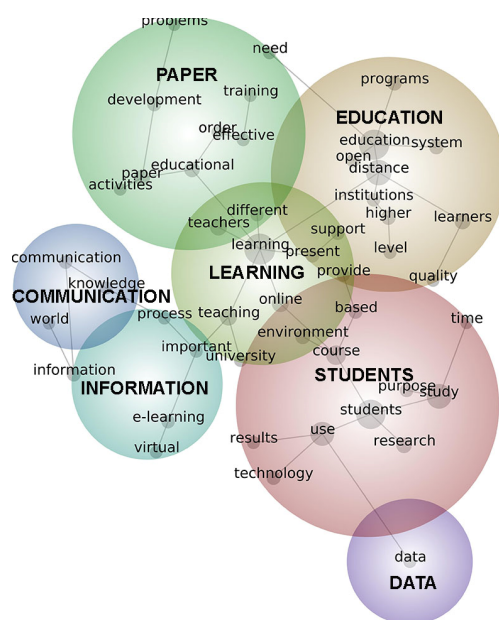


Figure 6: Concept map for the time period between 2008-2011

While online learning environments were not a new phenomenon, they became a viable learning space with many new concepts, such as semantic web, social networking, and cloud computing. Unlike other developments in technology, online learning in networked spaces devised its own pedagogy, which was then called the third generation of distance-education pedagogy (Anderson and Dron, 2011) and more specially known as connectivism (Siemens, 2004). With the opportunities that online learning environments afford, separation in time and space is no longer an issue; in contrast, the new motto with online learning is *anytime, anywhere learning* (Ally, 2004). Based on these developments in the field, not surprisingly, one of the major issues covered in the studies published in in TOJDE between 2008 and 2011 was technology supported online/virtual learning environments. In figure 6, the following path, *open education, learning, online, course, and environment* demonstrates how these concepts are tied to each other and how other peripheral concepts clustered around them.

Rise of the student centered, technology supported education and data-driven approaches (2012-2015)

Even though some themes and concepts such as information, technology, education, learning, are reoccurring in this time period, the final time period was entitled *Rise of the student centered, technology supported education and data-driven approaches*. The major themes were *students (100%), education (49%), technology (18%), development (11%), data (11%) and time*

(1%) (Figure 7). According to the analysis of articles published in TOJDE, the first time period (2000-2003) was *rise of the ICT and e-learning*, the second time period (2004-2007) was *increasing use of educational technologies in distance education*, and the third time period (2008-2011) was *technology supported online/virtual learning environments*. As a natural consequence of the previous periods, a shift from technology centered research to *student centered, technology supported education and data-driven approaches* emerged in the fourth time period (2012-2015).

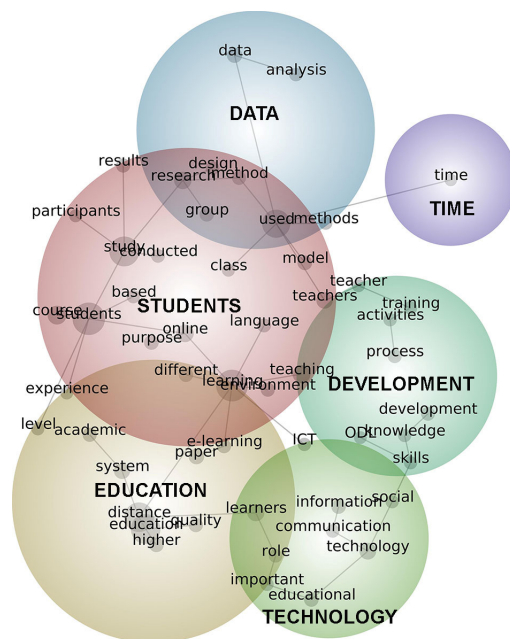


Figure 7: Concept map for the time period between 2012-2015

As can be seen in the path *method-used-data-analysis* (Figure 7) increasing the use of data-driven approaches has resulted in research that has adopted mainly quantitative approaches. This confirms Latchem's study (2009, in which this tendency was identified, and it seems that this tendency continues increasingly. However, as can be tracked in path *experience-students-online-learning-environment-elearning-ICT*, the main focus was *student centered, technology supported education*. When examining the articles published in TOJDE, it can be seen that topics such as students' academic achievements (Unal-Colak and Ozan, 2012; Hanbay, 2013; Deniz, Kesan and Izgiol, 2013; Celikoz and Gursoy, 2014), satisfaction (Green and Denton, 2012; Calli, Balcikanli, Calli, Cebeci and Seymen, 2013; Goulimaris, 2015; Anagnostopoulou, Mavroidis, Giossos and Koutsouba, 2015) and learning styles (Omidvar and Tan, 2012; Wu, 2014) were salient.

If we compare the period referred to as, *the rise of the student centered, technology supported education and data-driven approach*, which emerged in articles published in TOJDE between 2012 and 2015, with other periods that emerged in Distance Education journal and IRRODL, we can see how TOJDE followed a different path. It was *interactive learning, MOOCs and OERs* (2010–2014) in Distance Education journal and *the emergence of MOOCs and OER for 2011–2015* in IRRODL (Zawacki-Richter et al., 2017).

Overall evaluation and comparison of the themes and concepts

When examined, it was seen that the main characteristics in all concept maps was the information and communication technologies. This indicates that TOJDE has a special focus on educational technologies in distance education processes.

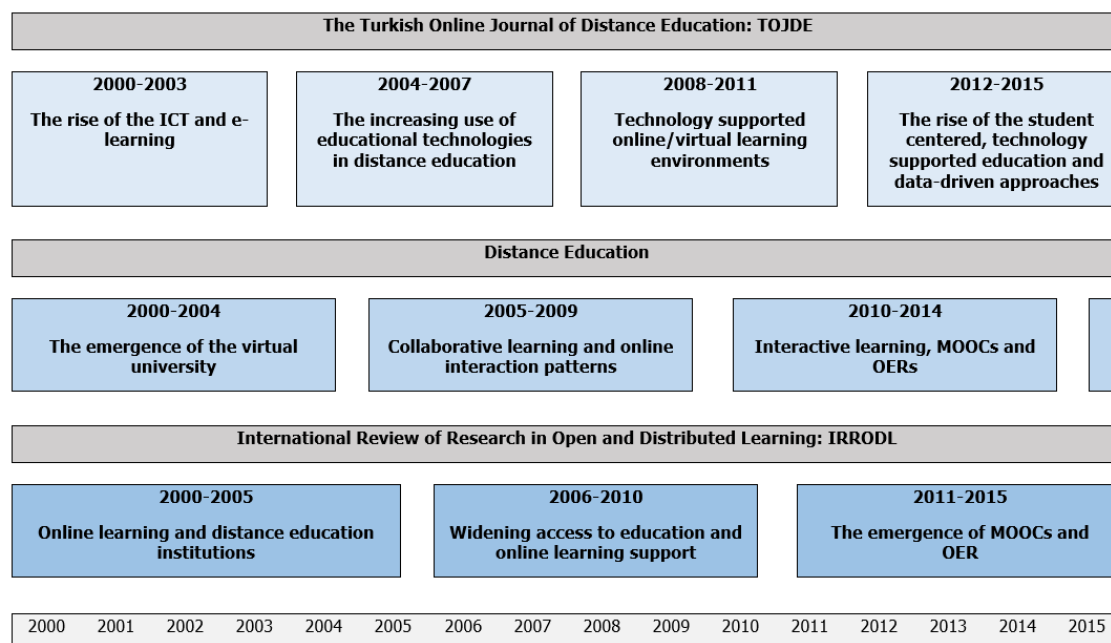


Figure 8: Comparison of the main themes in TOJDE, IRRODL and Distance Education Journals

If we compare the main characteristics of the periods that emerged in TOJDE, Distance Education, and IRRODL (Figure 8), we can see that all three journals reacted to the developments that had taken place by the 2000s in the same manner; however, as time progresses, we can also see that their focuses shifted to different aspects of the distance education field. While TOJDE laid special emphasis on topics such as ICT, educational technology, online learning environments and use of data; Distance Education and IRRODL shifted their focus to topics such as online learning institutions, interaction, learner support, online collaboration and accessibility. One thing that is very striking, this focus became very distinct and apparent after the first decade of the new millennium. While articles published in TOJDE covered topics related to the use of the data, articles published in Distance Education and IRRODL covered topics on new approaches and learning models, such as open educational resources and massive open online courses. These three journals represent different regions, and the articles originate from different countries. Considering that progress across the globe is not at the same pace and the needs of the regions vary according to socio-economic need, and probably many other reasons, this is natural and expected. In a broader perspective, it is also promising to see that researchers who contribute to these journals do not follow the same trends, thus adopting a realistic perspective and contribute to the field by providing knowledge in a wide spectrum of research interests.

Conclusions

With the purpose of identifying trends and patterns in distance education from the perspective of TOJDE, this study examined articles published between 2000 and 2015. The

computer-assisted content analysis showed that the *rise of the ICT and e-learning* (2000-2003), the *increasing use of educational technologies in distance education* (2004-2007), *technology supported online/virtual learning environments* (2008-2011), and the *rise of the student centered, technology supported education and data-driven approaches* (2012-2015) were the main themes.

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