

Educational Technology Research Trends in Turkey: A Content Analysis of the 2000–2009 Decade*

Yüksel GÖKTAŞ^a
Atatürk University

Sevda KÜÇÜK
İstanbul University

Melike AYDEMİR
Atatürk University

Esra TELLİ
Hacettepe University

Ömer ARPACIK
Atatürk University

Gürkan YILDIRIM
Atatürk University

İlknur REİSOĞLU
Karadeniz Technical University

Abstract

The purpose of this study is to examine Turkish educational technology studies in the academic literature within the scope of SSCI, and to reveal methodological trends within these studies. For this purpose, 460 Turkey-addressed articles, published between the years of 2000-2009 in 32 international journals, within the scope of 2010 SSCI were collected as data through ETPCF. The data were examined via content analysis and presented using descriptive statistical methods. According to the results, "educational environments" and "technology" were the topics mostly focused on in the articles. Regarding the research methods, quantitative analysis was generally used in these studies. Questionnaires were used as a data collection tool, and convenience sampling methods were also used widely. Descriptive analyses were mainly preferred as a data analysis method. The results coming out of this study will be helpful for directing the future studies.

Key Words

Educational Technology, Instructional Technology, Research Trends, Publication Classification.

Educational technologies, which emerge as innovative solutions to the question, "How can I learn more effectively?" change as a result of external factors on a day to day basis. Researchers have conducted numerous studies on the effects of these changes for students, teachers, learning environments and

learning processes. Their researches take a variety of studies, depending on the narrower focus within the field of education. But in order to direct future research, determining the kinds of studies, which are still needed, is also important. Therefore, this study will review recent Turkey-addressed educational technologies articles, which were published in international journals, to take note of both their topics of research and to find out the potential topics that need further studies.

Trends of educational technology have drawn the attention of many researchers from around the world (Caffarella, 1999; Costa, 2007; Hew, Kale, & Kim, 2007; Hranstinski & Keller, 2007; Klein, 1997; Latchem, 2006; Ma, 2000; Masood, 2004; Mihalca & Miclea, 2007; Ross, Morrison, & Lowther, 2010). The researchers themselves typically determine which topics to focus on, which research methods are best suited to their topics, which data to collect, how to select samples, and how to perform statistical analyses. All current tendencies in the field are a result of

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a **Yüksel GÖKTAŞ, Ph.D.**, is currently an Associate Professor at the Department of Computer Education and Instructional Technology. His research interests include Web 2.0, technology integration and usage, instructional design, problem-based learning, and research methods. Correspondance: Assoc. Prof. Dr. Yüksel Goktas, Atatürk University, Kazım Karabekir Faculty of Education, Department of Computer Education & Instructional Technology, 25240 Erzurum/Turkey. E-mail: yukselgoktas@atauni.edu.tr Phone: +90 242 231 4047.

the precedents and trends that earlier researchers set as they worked out these elements in their studies.

Some researchers examined a considerable number of the trends in the field of educational technologies. For instance, focus on journals of Klein (1997), Masood (2004), Hew et al., (2007), Ross et al., (2010) *Educational Technology Research and Development* (ETR&D); Hranstinski and Keller (2007) *Computers & Education*, *Educational Media International*, *Journal of Educational Computing Research* and *Journal of Educational Media*; Latchem (2006) *British Journal of Educational Technology* (BJET) were examined. As a result of the conducted analysis, it was found out that most of studies in educational technology are concentrated on media research, computer based and computer aided instruction, learning psychology, distribution systems, instructional development, instructional methods, and instructional design. Once experimental methods were often employed, but recently, qualitative methods have been increasingly used. The contributing authors of ETR&D in particular are frequently referenced in contemporary field studies.

Another group of reviewing researchers focus on "educational technologies" dissertations (Caffarella, 1999; Costa, 2007; Ma, 2000). Computer-based and computer-aided instruction topics are generally the focus of these, and quantitative research methods are employed in most of these studies. But recently, qualitative studies have been increasing while experimental studies have been considered important.

Only a limited amount of attention has been given to Turkey-addressed educational technology studies in the academic literature. Şimşek et al. (2008) examined 64 "educational technologies" dissertations in their study, in which they offered a general evaluation of the dissertations published in the last 10 years, in Turkey. According to Şimşek et al. (2008), those dissertations concentrated on teaching and learning approaches, e-learning, and multimedia. Additionally, they emphasized that in Turkey the quantitative paradigm was more preferred than the qualitative one. Achievement tests, attitude scales, questionnaires, and interview forms are among the most employed data collection tools. Their other important observations include that these quantitative dissertations primarily feature sample selection methods such as convenience and purposeful sampling and census, and that data was mainly analyzed via descriptive statistical methods.

Alper and Gülbahar (2009) examined articles, published between 2003-2007 in the *Turkish Online Journal of Educational Technology* (TOJET) and observed commonalities similar to those noted

by Şimşek et al. (2008). These studies distinctively focused on the use of online systems in education, which has been a popular topic. Gülbahar and Alper (2009), also published another review study on current trends in "educational technologies", in which they examined articles published in the last three years in the field. They emphasized that their review mainly found out the same trends as the ones noted in their previous study.

Another important study conducted in Turkey helped to determine trends in emerging educational technologies. Erdoğan and Çağiltay (2009) examined dissertations published in all of the universities that have educational technologies Master's and doctoral programmes. [What is their date range?] They found that the most popular three topics handled in these dissertations were media, media comparisons, and student variables. Their findings in related to the methodological trends mainly correspond to the findings revealed by other researchers. Akça-Üstündağ (2009) also examined Master's theses and emphasized that distance education studies are increasing, while studies on computer-aided instruction are decreasing. This finding is similar to the results of Gülbahar and Alper (2009). She has similarly expressed that quantitative methods are widely used, and that experimental methods are also prominent. According to her, questionnaires, achievement tests, and interviews are commonly used as data collection tools. Sert (2010) examined 173 Turkey-addressed articles published between the years 1989-2009 in 32 international journals within the scope of SSCI via content analysis. According to her findings, "learning outcomes" were the most reviewed topic within the research article sets. As in the study by Gülbahar and Alper (2009), Sert (2010) found that most of those studies were developed as a survey, and samples were mainly selected from undergraduate students. Parallel to the results of Şimşek et al. (2008), she observed that samples in the studies that they reviewed were selected via the convenience sampling method.

An area not extensively covered in these reviews is, trends of Turkey-addressed educational technologies studies which were presented internationally. Therefore, an analysis of articles published in journals within the scope of SSCI in terms of methodological dimensions would be an important contribution to the field. Many of these studies have notably produced only one-dimensional results. Identifying those components which determine tendencies will allow us to make evaluations from different perspectives for the benefit of future researchers in the field of educational technologies. In addition, areas of

research that have not been covered or which could usefully be covered more extensively in international publications can be highlighted.

Thus, the purpose of this study is to reveal the descriptive characteristics, methodological dimensions, and general trends of Turkey-addressed educational technology studies published in international journals within the scope of SSCI between the years 2000-2009. The specific research questions that guided this examination are listed below.

- 1) Generally, in which journals were educational technology studies published?
- 2) Which topics were commonly researched in educational technology, and what is their distribution by years?
- 3) Which methods were commonly used in educational technology studies?
 - a. What is the distribution of methods by years?
 - b. What methods are commonly used in relation to research topics?
- 4) What research patterns emerged according to specific research topics?
 - a. Which patterns were commonly preferred for topics in which quantitative methods were used?
 - b. Which patterns were commonly preferred for topics in which qualitative methods were used?
 - c. Which patterns were commonly preferred for topics in which mixed methods were used?
 - d. Which patterns were commonly preferred for topics in which literature review methods were used?
- 5) Which data collection tools were commonly used in educational technology studies?
- 6) What are the common data collection tools used in educational technology studies according to their methods sections?
- 7) What are the sampling characteristics in educational technology studies generally?
 - a. Which sample selection methods were commonly preferred?
 - b. Which sample levels were commonly selected?
 - c. What is the range of common sample sizes?
- 8) What data analysis methods are commonly used in educational technology studies?

Method

Content analysis was employed in this study to examine Turkey-addressed educational technology studies that were published in 32 international journals within the scope of SSCI. In this study, content analysis was used to classify the data based on identified themes and concepts for good readability (Bauer, 2003; Cohen, Manion & Morrison, 2007; Fraenkel & Wallen, 2000; Yıldırım & Şimşek, 2005).

Sample

The study sample consists of 460 Turkey-addressed educational technology articles. These articles were published in 32 international journals within the scope of SSCI between the years 2000-2009. First, journals which published articles on educational technologies within the scope of SSCI were selected. Then, articles which were published in the last ten years in these journals were examined.

Data Collection Tools

The Educational Technologies Publication Classification Form (ETPCF) was used as a data collection tool. This is based on the research questions and the related studies (Hew et al., 2007; Masood, 2004; Reeves, 1995; Sözbilir & Kutu, 2008). During the development process, first a draft copy was created; this was then examined initially by peers and expert juries, and then by a language expert. Following the revisions, the form was tested for reliability. Pilot study was implemented by 20 graduate students who are taken "Research Methods in Instructional Technology" course. They examined 100 articles with ETPCF form and the form was revised according to their feedbacks. The form, which was used as a data collection tool, consists of seven sections. The first section is the identification record. This part displays the names of the authors of the examined article, and the name of the journal which published the article. Other sections cover the type, topic, method, and data collection tools, sample, and data analysis methods of the articles respectively.

Data Analysis

Data obtained from the articles, which were examined via content analysis, were analyzed by using descriptive statistics. Both the percentage and the frequency of the items were calculated.

Conclusion and Discussion

As seen in Graphic 1, the highest number of articles was published in TOJET in the last ten years. That high total is followed by the *Hacettepe University Journal of Faculty of Education* (HUJOE), the *Eurasian Journal of Educational Research* (EJER), *Computers & Education* (C&E), and *Educational Technology & Society* (ET&S). Three hundred fourteen of the examined articles were published in national journals, while the other 146 were published in international journals. This suggests that researchers in Turkey prefer national journals (Sert, 2010).

The topics which were handled most within the educational technology studies were learning environments and technology. These are followed by distance education, multimedia, and teacher education respectively. In the literature, technology-enhanced learning environments are the most studied topic in the field (Alper & Gülbahar, 2009; Caffarella 1999; Erdoğan & Çağiltay, 2009; Hew et al., 2007; Ma, 2000; Masood, 1997; Ross et al., 2010; Şimşek et al., 2008). Another covered topic was distance education, which affects educational technologies significantly (Reiser & Ely, 1997).

Quantitative methods are prominent in educational technology studies. After this, literature reviews, and qualitative and mixed methods follow. The national literature (Alper & Gülbahar, 2009; Gülbahar & Alper, 2009; Şimşek et al., 2008; Şimşek et al., 2009) demonstrates that quantitative methods are still the preferred method for educational technology studies within Turkey. In the international studies, however, though quantitative methods were preferred most of the time (Hannafin & Young, 2008; Ross & Morrison, 2008; Ross, Morrison, & Lowther, 2005), qualitative methods are also growing in popularity (Kelly & Lesh, 2000; Masood, 1997). In Turkey, the frequent application of quantitative methods may stem from the fact that quantitative methods have many positive aspects. Research results derived from them can be generalized; their results are relevant to a wider population; and they are generally affordable in terms of time and financial costs. Despite these advantages, however, the number of qualitative and mixed studies increased in 2009, and both quantitative paradigms and literature reviews were not so many in number. Therefore, now it is possible to say that Turkey-addressed educational technology research has begun to reflect methodological tendencies that are commonly found abroad. Driscoll (1995) stated that educational studies should be open to different research methods because of nature of the instructional systems.

Research topics which were explored via quantitative, qualitative, mixed, and literature review methods were usually examined via experimental, quasi-experimental, survey, case study, and literature review research patterns. Similar research results may be found in the literature (Gülbahar & Alper, 2009; Hew et al., 2007; Hranstinski & Keller, 2007; Ross et al., 2010). This may stem from the fact that experimental and quasi-experimental research patterns are prioritized so as to increase internal validity (Slavin, 2008). Additionally, it may also originate from the fact that case study, explanatory, triangulation, and literature review research patterns are also effective.

Likert-type questionnaires, achievement tests, characterization, and attitude scales were utilized often as quantitative approach methods, while structured and semi-structured interviews were utilized often as data collection tools in qualitative and mixed approach methods. Neither Akça-Üstündağ (2009), Alper and Gülbahar (2009), Hew et al. (2007), nor Şimşek et al. (2009) compared methods with data collection tools in their studies. However, their reviews did indicate that surveys and interviews were used to a considerable degree in educational technology studies. Most likely, the use of surveys in the studies is due to the need to obtain data from extensive samples in a short period of time (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2009; Hew et al., 2007) and to the fact that surveys minimize costs (De Leeuw & Hox, 1996).

When the numbers in samples were examined, the number of studies which contained samples of over than 1000 were very low. When we look at the result that shows surveys are the most used pattern, using larger samples should be the optimal practice in regard to the logic of the pattern. When the types of samples were observed, it was discovered that the studies were usually conducted with pre-service teachers, undergraduate students, and teachers. This result indicates that recent studies of educational technologies concentrate on learning-teaching environments. As Sönmez (2005) has noted, the situation can be explained by unclear subquestions or the weaknesses of researchers' knowledge about statistics and research methods. Furthermore, Erdoğan (2009) stated that it can be due to time constraints, the legal and ethical processes, and the aims of the researchers to obtain the more data in a short time.

Descriptive and inferential analysis was utilized in quantitative studies, while descriptive analysis and content analysis were used in qualitative ap-

proaches. Also, both quantitative and qualitative data analyses were utilized in mixed methods studies, while only qualitative data analysis methods were used with literature reviews. Content analysis was used frequently in mixed and literature review. Similar results may be found in the literature (Hsieh & Shannon, 2005; Masood, 2004; Şimşek et al., 2008; Şimşek et al., 2009). Analysis methods were not aligned with the research methods. This indicates a possibility that data may be analyzed without considering whether the data is appropriate for the analysis method. If that is the case, then this may also indicate that the researchers' statistics will be weak.

Ultimately, in terms of the number of examined articles and research questions, it is possible to say that this study is more comprehensive than the previous ones which were intended to determine the tendencies of educational technology studies. This study reviews both the positive and negative aspects of the previous surveys, and it also serves as a guide to direct future studies. Reviewers and the editors of the field's journals may also benefit from these results. However, the fact that this study covers educational technology studies published only in 32 international journals between the years 2000-2009 may be considered as a limitation. Therefore, the examination of journals without SSCI and of articles from a larger date range will reflect even wider trends of development and change in the educational technology studies conducted in Turkey.

Recommendations

Based on the findings and discussion presented here, the following recommendations are made specifically addressing to practitioners and researchers.

- By examining more periodicals, including those in indices, future studies can be directed to reflect the development and changes in educational technological studies conducted in Turkey.
- Recently, Turkey-addressed articles published in journals within the scope of SSCI have increased. In order to continue this trend, high quality interdisciplinary studies should be produced.
- Studies regarding systematic changes and management may also be conducted to add different perspectives to the field.
- In order to conduct studies in keeping with international trends, the emphasis given to qualitative and mixed methods should be increased,

and researchers should try to be more informed about these methods.

- Going beyond the ordinary, the use new patterns which have not been used before or were used very rarely (e.g., single subject, ex-post facto, historical analysis, cultural analysis, theoretical analysis, secondary data analysis, meta-analysis, co-relational, etc.) instead of the use of standard research patterns may eliminate deficiencies relating to this aspect in the field.
- By paying attention to sample selection methods, objective and random sampling, which is appropriate for normal distribution, can be provided.
- The majority of the examined studies have samples from pre-service teachers or teachers. Even the research questions for different topics are answered by pre-service teachers or teachers. Conducting studies with different types of samples (i.e., different types of participants) may lead to different solutions.
- The size of the samples can be increased; this is in keeping with the logic: more data, more accurate the results.
- By diversifying the data analysis methods, researchers can acquire a better understanding of (and experience with) data analysis methods. Therefore, research methods and statistical courses which are offered to graduates should be diversified and enriched.
- This content analysis is a product of a long and tedious effort. In order to prevent other researchers from experiencing the same difficulties, the process should be planned extensively in the beginning.

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Ek 1.

İncelenen Dergilerde Yer Alan Makalelerin Yıllara Göre Dağılımı

Dergi Adı	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	TOPLAM
The Turkish Online Journal of Educational Technology (TOJET)	-	-	6	39	49	47	24	16	16	17	214
Hacettepe University Journal of Faculty of Education (HUJOE)	3	1	7	12	4	4	3	3	13	4	54
Eurasian Journal of Educational Research (EJER)	-	1	2	2	-	5	8	-	1	11	30
Computers & Education	-	-	-	-	-	-	1	2	12	14	29
Educational Technology & Society (ET&S)	-	-	-	-	-	2	10	5	7	4	28
Education & Science (E & S)	-	3	2	-	3	-	3	3	4	2	20
Educational Sciences: Theory & Practice	-	2	3	2	1	-	-	3	1	4	16
British Journal of Educational Technology (BJET)	-	-	-	2	-	1	-	4	2	4	13
The New Educational Review	-	-	-	-	-	-	-	-	2	5	7
Asia Pacific Education Review	-	-	-	-	-	-	-	1	1	4	6
Australasian Journal of Educational Technology	-	-	-	-	-	-	1	1	2	1	5
Assessment & Evaluation in Higher Education	-	-	-	1	-	-	1	-	1	-	3
Educational Research	-	-	-	-	-	1	1	1	-	-	3
Educational Studies	-	-	-	-	-	-	1	-	1	1	3
Instructional Science	-	-	-	-	-	1	-	1	1	-	3
Journal of Computer Assisted Learning	-	-	-	1	-	1	-	1	-	-	3
Journal of Science Education and Technology	-	-	1	-	-	-	1	-	-	1	3
Educational Technology Research and Development (ETR&D)	-	-	-	-	1	1	-	-	-	-	2
European Journal of Teacher Education	-	-	-	-	-	-	-	-	-	2	2
Innovations in Education and Teaching International	1	-	-	-	-	-	1	-	-	-	2
International Journal of Computer-Supported Collaborative Learning	-	-	-	-	-	-	-	-	1	1	2
Teaching and Teacher Education	-	-	-	-	-	-	-	-	2	-	2
Asia-Pacific Journal of Teacher Education	-	-	-	-	-	-	-	1	-	-	1
Information Processing & Management	-	-	-	1	-	-	-	-	-	-	1
Interactive Learning Environments	-	-	-	-	-	-	-	-	1	-	1
Journal of Teaching in Physical Education	-	-	-	-	-	-	1	-	-	-	1
Learning and Instruction	-	-	-	-	-	-	-	1	-	-	1
Social Science Computer Review	-	-	-	-	-	-	-	-	-	1	1
Teaching in Higher Education	-	-	-	-	-	-	-	-	-	1	1
The Asia-Pacific Education Researcher	-	-	-	-	-	-	-	-	-	1	1
The Internet and Higher Education	-	-	-	-	-	-	-	-	1	-	1
The Journal of the Learning Sciences	-	-	-	-	-	-	-	1	-	-	1
TOPLAM	4	7	21	60	58	63	56	44	69	78	460

Ek 2.**Eğitim Teknolojileri Yayın Sınıflama Formu**

A-MAKALENİN KÜNYESİ			
1. Makalenin Adı:.....		2. Yazarı/ları:.....	
3. Derginin Adı:.....			
4. Yazarın/ların Üniversitesi:.....		5. Yıl:.....	
6. Cilt:.....		7. Sayı:.....	
8. Sayfa:.....		9. Referans Sayısı:.....	
10. Araştırma Sorusu/Hipotez Sayısı:.....		11. Çizelge (Tablo) Sayısı:.....	
12. Şekil Sayısı:.....		13. Grafik Sayısı:.....	
14. Yazarlar:Türk () Yabancı() Karma()		15. Yazı Dili: Türkçe () İngilizce () Diğer ()	
B-MAKALENİN TÜRÜ			
1. Alan yazın derleme ()		4. Deneysel (Uygulamalı) çalışma ()	
2. Yöntem çalışması ()		5. Eylem araştırması ()	
3. Kuramsal çalışma ()		6. Betimsel çalışma ()	
		7. Değerlendirme çalışması ()	
		8. Mesleki çalışma ()	
		9. Diğer ()	
C-MAKALENİN KONUSU			
1. Tasarım & geliştirme		4. Çoklu ortam (multimedia) ()	
2. Uzaktan eğitim/öğrenme		5. Araştırma ve teori ()	
3. Yönetim		6. Öğretim ortamları ve teknoloji ()	
		7. Sistematik değişim ()	
		8. Öğretmen eğitimi ()	
		9. Eğitim ve performans ()	
		10. Diğer ()	
D- MAKALENİN YÖNTEMİ			
1. NİCEL		2. NİTEL	
11.Deneysel		12.Deneysel olmayan	
111.Tam Deneysel ()	121.Betimsel	21. Kültür Anlz. ()	
112. Yarı Deneysel ()	122. Karşılaştırmalı	22. Olgu Bilimi ()	31. Acıklayıcı (nicel→nitel) ()
113. Zayıf deneysel ()	123.Korelasyonel	23. Kuram Oluşturma ()	32. Keşfedici (nitel→nicel) ()
114.Tek Denekli ()	124.Tarama	24. Eleştirel Çalışma ()	33.Çeşitleme (nicel+nitel) ()
	125.Ex post facto	25. Örnek Olay ()	41. Meta analiz ()
	126.İkincil Veri Anlz.	26. Tarihsel Anlz. ()	42. Alan yazın derleme ()
		27. Kavram Anlz. ()	
E- VERİ TOPLAMA ARAÇLARI			
Veri Toplanmamış ()			
1. Gözlem		2. Görüşme/Odak Grup Görüşmesi	
3. Başarı Testleri		4. Tutum, algı, kişilik veya yetenek testleri	
11. Katılımcı	21.Yapılandırılmış ()	31.Açık Uclu ()	41. Acık Uclu ()
12. Katılımcı olmayan	22.Yarı-yapılandırılmış ()	32.Çoktan seçmeli ()	42. Çoktan seçmeli ()
	23.Yapılandırılmamış ()	33.Diğer ()	43. Likert ()
	24.Online görüşme ()		44. Diğer ()
5. Anket		6. Döküman ()	
7. Alternatif Araçlar		8. Diğer (yazınız)	
51. Açık Uclu		(performans testleri, tanılayıcı testler, kavram haritaları, portfolyo)
52. Çoktan seçmeli		
53. Likert		
54. Diğer		

Ek 2'nin devamı**Eğitim Teknolojileri Yayın Sınıflama Formu**

F- ÖRNEKLEM		Veri Toplanmamış ()
Örneklem Düzeyi	Örneklem Sayısı	Örneklem Seçim Şekli
1. Okul Öncesi		
2. İlköğretim (1-5)		
3. İlköğretim (6-8)		
4. Ortaöğretim (9-12)	1. 1-10 arası ()	1. Rastgele ()
5. Lisans (Eğitim Fak.)	2. 11-30 ()	2. Kolay ulaşılabilir örnekleme ()
6. Lisans (Diğer)	3. 31-100 ()	3. Amaca uygun ()
7. Lisans üstü (Master-Doktora)	4. 101-300 ()	4. Evrenin tamamı ()
8. Öğretmenler	5. 301-1000 ()	5. Diğer ()
9. Öğretim elemanları	6. 1000'den fazla ()	
10. Veliler		
11. Yöneticiler		
12. Diğer.....		
G-VERİ ANALİZ YÖNTEMİ Analiz Yapılmamış ()		
1. NİCEL VERİ ANALİZLERİ		2. NİTEL VERİ ANALİZLERİ
1. Betimsel	2. Kestirimsel	
11. Frekans/yüzde/çizelge	21. Korelasyon	
12. Ortalama/standart sapma	22. t-testi	
13. Grafikte gösterim	23. ANOVA/ ANCOVA	3. Nitel
14. Diğer.....	24. MANOVA/ MANCOVA	31. İçerik analizi
	25. Faktör analizi	32. Betimsel analiz
	26. Regresyon(gerileyici)	33. Diğer
	27. Non-Parametrik testler	
	28. Diğer	

Makaleyle ilgili eklemek istedikleriniz varsa lütfen yazınız: