Educational technology research trends in Turkey from 1990 to 2011

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A B S T R A C T

The purpose of this study is to examine the characteristics, methodologies, and general trends in Educational Technology articles, written by authors from Turkey, published in journals listed in the SSCI, SCI, and ERIC indexes from 1990 to 2011. A total of 1151 (SSCI:813, SCI:38, ERIC:300) articles published in 94 journals were examined via content analysis, using the ‘Educational Technology Papers Classification Form’ (ETPCF). The results show that the number of published Educational Technology studies dramatically increased in the years 2002 and 2007. “Educational environments and technology”, “distance education” and “multimedia” were the predominant subjects of the articles, though there were variations in terms of research topics and methodologies. Regarding research methodologies, quantitative studies were the most common type. Questionnaires and interviews were most commonly used as data collection tools, and the convenience sampling method was also widely used. The frequently studied sample participants were preschool teachers and other undergraduate students. In the present study, cross tabulation is used to present the findings.

1. Introduction

Technology plays a significant role in the development of education and is more important today than ever before. The exponential growth of technology usage in education, in applications such as distance education, simulations, educational games, and virtual worlds, has also attracted the attention of Educational Technology researchers. The Association for Educational Communications and Technology (AECT) defines Educational Technology as “the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources” (AECT, 2004). The field of Educational Technology has grown and changed greatly over the past century, affected by various influences including historical forces, paradigm shifts in educational psychology, emerging technologies, and evolving approaches to inquiry. In addition to developments and changes, different research approaches are regularly used in this field (Driscoll, 1995). Educational Technology practitioners and researchers study a wide array of topics and methodologies.

Educational Technology researchers have previously traced trends in the field’s articles, theses, and dissertations. Some of the researchers from around the world have examined articles which published in international journals (Hew, Kale, & Kim, 2007; Hranstinski & Keller, 2007; Klein, 1997; Latchem, 2006; Ma, 2000; Ross, Morrison, & Lowther, 2010). However, only a limited amount of attention has been devoted to Educational Technology journal articles, written by authors from Turkey, in the academic literature. Fortunately, such studies have increased in recent years (Alper & Gulbahar, 2009; Bozkaya, Erdem-Aydin, & Genc-Kumtepe, 2012; Goktas et al., 2012; Gulbahar & Alper, 2009; Keser & Ozcan, 2011; Sert, 2010). Some researchers have also examined theses or dissertations in the field of Educational Technology (Akca-Ustundag, 2009; Caffarella, 1999; Costa, 2007; Erdogmus, 2009; Masood, 2004; Simsek et al., 2008). The researchers themselves typically determine which topics they will focus on, which research methodologies are best suited to their topic, and how to collect data. A summary of the current literature of Educational Technology surveys is presented in Fig. 1, using these three categories.

A broad analysis of the methodologies used in the articles published in the three journal indexes (SSCI: Social Science Citation Index, SCI: Science Citation Index, ERIC: Education Resources Information Center) can yield important contributions to the field. Similar prior studies...
have generally been conducted using relatively limited numbers of publications. In the present study, a larger range of journals and publications are examined. Also, many earlier studies notably produced only one-dimensional results. Identifying the components which determine trends will permit evaluations from different perspectives for the benefit of future researchers in the field. This study will hopefully also stimulate similar and comparative studies with works published in different indexes. In addition, areas of research that have not been previously covered will be highlighted, and some which could usefully be covered more extensively in international publications will be noted. This study summarizes the past twenty-two years’ studies in Educational Technology to help us become better prepared for future research challenges and the findings may be used to increase the quality of future research studies, by taking attention of researchers to important points and gaps realized throughout this research study. Moreover, Educational Technology researchers, from different countries, will be able to compare the results with their countries. The purpose of this study is to examine the characteristics, methodologies, and general trends in Educational Technology studies, conducted by authors from Turkey, published in international journals listed within the SSCI, SCI, and ERIC indexes between the years 1990–2011. The specific research questions that guided this examination are:

1) In which journals were Educational Technology studies mainly published?
2) What topics were commonly researched? How have the investigated subjects changed, according to these indexes?
3) Which research methodologies were commonly used? How have these changed over time?
   a. What is the distribution of methodologies by years?
   b. What methodologies were commonly used for different research topics?
4) What are the data collection tools that were most commonly used, and what was their relation to the respective research methodologies? Have these changed over time, and if so, how?
5) Which sample selection methodologies were commonly preferred? Has this aspect of the studies changed over time?
6) What sample populations (types of people) were commonly selected for the research topics?
7) What is the range of common sample sizes? Have these varied over time?
8) What data analysis methods were commonly used? How have these changed over time?

2. Methodology

Content analysis methodology was used to analyze each article. Content analysis can be referred to as a generic name for a variety of textual analyses that typically involves comparing, contrasting, and categorizing a set of data. Therefore, it was used to classify the data, and to divide it by different identified themes and concepts (Bauer, 2003; Fraenkel & Wallen, 2000; Schwandt, 1997).

2.1. Sample

The study sample consisted of 1151 Educational Technology articles, written by authors from Turkey, published in international journals. These articles are all listed in the SSCI, SCI, and ERIC indexes for the years 1990–2011. The authors reviewed SSCI, SCI and ERIC indexes’

![Fig. 1. Summary of the literature regarding the most commonly used methodologies and researched topics.](image-url)
journal lists and identified journals that deal primary with Educational Technology (Bray, 2003; Price & Maushak, 2000). In addition to these journals, it was tried to determine the journals which include publications related to Educational Technology. For this purpose, some keywords that may take part in title of journals related to Educational Technology were determined with expert juries in the field. Keywords are “education, instruction, learning, teaching, teacher, learner, internet, computer, technology, research”. As a result of the review, 378 journals were determined (SSCI: 65, SCI: 63, ERIC: 250). Then, full-length articles which were published between the years 1990 and 2011 and written by Turkish authors in these journals were examined. The abstracts of these articles were read and decided whether it is related to the field of Education Technology. Finally, 1151 articles published in 94 journals were determined that the scope of the study. The data collection process is presented in Fig. 2.

2.2. The data collection tool

The Educational Technology Publication Classification Form (ETPCF) was used as the data collection tool. This form had been used in a similar, prior study but has been adapted for this examination to ensure greater reliability (Goktas et al., 2012). The form consists of seven sections. The first section is the identification record. This part displays the name and the author(s) of each examined article, and the title of the journal which published each article. Other sections cover the type, topic, methodology, data collection tools, sample, and data analysis methods of the articles, respectively.

2.3. Data analysis

During the content analysis process, one faculty member and four doctoral students worked together. In order to achieve a reliable classification of the articles, initially the authors worked together. Sets of the selected articles were classified. Initial disagreements during the content analysis process were discussed and resolved, and then the rest of the articles were analyzed by collaborative work between the authors. Again, any disagreements were resolved under the leadership of the supervisor. The data were controlled for transmission errors by the researchers. Finally, the data were organized according to the research questions. The data obtained from the articles were analyzed using descriptive statistics. Both the percentage and the frequency of the items were calculated.

3. Findings

3.1. Most commonly published journals

Those journals which published more articles between 1990 and 2011 were classified according to their listing indexes and presented in Table 1. TOJET published the highest number of articles in the SSCI index; the Turkish Online Journal of Distance Education (TOJDE) published the highest number in ERIC; and IEEE Transactions on Education published the highest number in the SCI.

3.2. Subject trends

Table 2 shows the distribution of article subjects in the different indexes. There were a high number of studies on educational environments and technology (41.7%), distance education and learning (10.3%), and multimedia (9.0%) in the articles indexed in the SSCI; on educational environments and technology (34.2%), design and development (26.3%), and multimedia (18.4%) in the articles indexed in the SCI; and on distance education and learning (34.7%), educational environments and technology (23.3%), and education and performance (11.7%) in the articles indexed in ERIC.

![Fig. 2. The data collection process.](image-url)
3.3. Methodologies and method trends

When the research methodologies were examined in comparison with methods, mostly non-experimental methods were preferred (34.8%) in the quantitative studies. This high percentage was followed by the qualitative studies (22.1%). The percentage for the usages of all the methods in the mixed studies (9.9%) was considerably lower than those noted above (Table 3).

When the research methods were examined across the different indexes, surveys (14.9%), quasi-experimental (13.3%), case studies (13.0%), and literature reviews (13.0%) were used the most in the articles in the SSCI; case studies (39.5%) and descriptive methods (18.4%) were used the most in the SCI articles; and case studies (28.3%), descriptive methods (17.3%), and literature reviews (14.0%) were used the most in the articles in ERIC (Table 3).

Fig. 3 shows the distribution of methodologies used in the articles by the publication year. The number of articles is few until 2001, after which an increase can be seen. A decrease occurred in the number of articles published in 2007; however, publications significantly increased after 2007. The quantitative methodology was used most often, followed by the qualitative and mixed methodologies.

Table 4 shows the distribution of Educational Technology research methodologies by subjects. In other category (literature review and meta-analysis) methodologies, the most researched subject was distance education. The most researched subject was educational environments and technology in qualitative, quantitative and mixed methodologies. This was followed by distance education for the qualitative and quantitative methodologies, and by teacher training for the mixed methodologies studies. The subjects that were preferred least across all of the research methodologies were systemic change and administration.

3.4. Data collection tools

Table 5 shows the data collecting instruments and their distribution by methodologies. Questionnaire (36.7%) and attitude, perception, personality, and aptitude tests (24.3%) were used most in the quantitative studies. Interviews or focus group interviews (41.6%) and documents (24.8%) were used the most in the qualitative studies. Interviews or focus group interviews (33.1%) and questionnaires (27.3%) were the most preferred data collecting instruments in the mixed studies. Only documents were used in the other category studies.
3.5. Sample selection methods

Table 6 shows the distribution of the sample selection methods by the three journal indexes. The most commonly preferred sample types across the SSCI, SCI, and ERIC indexes were the purposive (47.8%) and the convenience (32.7%) samples. These were followed by the random (16.8%) and the whole population (2.2%) types.

3.6. Sample populations

Table 7 shows the sample populations chosen for the research subjects. Mostly preservice teachers (31.1%) and other undergraduate students (17.3%) were chosen as sample groups. Parents (1.1%) and early childhood students (1.1%) were preferred least often. In general, preservice teachers and teachers were preferred participants for research on educational environments and technology. Other undergraduate students were used for distance education and learning studies; and preservice teachers were preferred for studies on multimedia, education and performance, teacher training, and design and development. Other sample populations were used more often in research and theory; teachers were employed more for systemic change; and administrators were used more for administration.

3.7. Sample sizes

Table 8 shows the distribution of sample sizes by methodologies. A group of 31–100 persons (35.9%) or of 101–300 persons (28.6%) was most preferred in the quantitative methodology studies; 11–30 persons (26.0%) or 31–100 persons (24.0%) were typically used in the qualitative methodology studies; and 31–100 persons (36.8%) or 11–30 persons (23.7%) were normally used in mixed methodologies studies. More than 1000 persons (4.3%) were used in very few of the studies.
3.8. Data analysis methods

Table 9 shows the distribution of the data analysis methods by the different indexes. In the quantitative studies, the use of frequencies/percentages/tables (29.7%), and means and standard deviations (15.6%), which are both descriptive analysis techniques, were the most preferred overall. T-tests (10.7%) and ANOVA/ANCOVA (7.2%) were more preferred as inferential techniques. Content analysis was the most preferred qualitative technique.

Table 4
Cross tabulation of article subjects and research methodologies.

<table>
<thead>
<tr>
<th></th>
<th>Educational environments and technology</th>
<th>Distance education</th>
<th>Multimedia and performance</th>
<th>Education and performance</th>
<th>Teacher training</th>
<th>Research and theory</th>
<th>Design &amp; development</th>
<th>Systemic change</th>
<th>Administration</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative n</td>
<td>258</td>
<td>65</td>
<td>57</td>
<td>58</td>
<td>52</td>
<td>47</td>
<td>25</td>
<td>5</td>
<td>3</td>
<td>33</td>
<td>602</td>
</tr>
<tr>
<td>%</td>
<td>42.4</td>
<td>10.7</td>
<td>9.5</td>
<td>9.5</td>
<td>8.6</td>
<td>7.7</td>
<td>4.1</td>
<td>0.8</td>
<td>0.5</td>
<td>5.4</td>
<td>100</td>
</tr>
<tr>
<td>Qualitative n</td>
<td>75</td>
<td>58</td>
<td>16</td>
<td>16</td>
<td>18</td>
<td>17</td>
<td>35</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>259</td>
</tr>
<tr>
<td>%</td>
<td>29.5</td>
<td>22.8</td>
<td>6.2</td>
<td>6.3</td>
<td>7.1</td>
<td>6.7</td>
<td>13.8</td>
<td>0.8</td>
<td>1.6</td>
<td>2.8</td>
<td>100</td>
</tr>
<tr>
<td>Mixed n</td>
<td>44</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>22</td>
<td>8</td>
<td>5</td>
<td>1</td>
<td>–</td>
<td>2</td>
<td>114</td>
</tr>
<tr>
<td>%</td>
<td>38.6</td>
<td>13.2</td>
<td>8.8</td>
<td>8.8</td>
<td>19.3</td>
<td>7.0</td>
<td>4.4</td>
<td>0.9</td>
<td>0</td>
<td>1.8</td>
<td>100</td>
</tr>
<tr>
<td>Other n</td>
<td>45</td>
<td>52</td>
<td>19</td>
<td>18</td>
<td>5</td>
<td>21</td>
<td>11</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>176</td>
</tr>
<tr>
<td>%</td>
<td>25.7</td>
<td>29.8</td>
<td>10.8</td>
<td>10.3</td>
<td>2.9</td>
<td>12.0</td>
<td>6.3</td>
<td>2.9</td>
<td>1.1</td>
<td>4.0</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5
Cross tabulation of the data collection tools and research methodologies.

<table>
<thead>
<tr>
<th></th>
<th>Quantitative</th>
<th>Qualitative</th>
<th>Mixed</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Questionnaires</td>
<td>296</td>
<td>36.7</td>
<td>33</td>
<td>10.9</td>
<td>66</td>
</tr>
<tr>
<td>Documents</td>
<td>27</td>
<td>3.3</td>
<td>126</td>
<td>41.6</td>
<td>80</td>
</tr>
<tr>
<td>Interviews or focus group interviews</td>
<td>196</td>
<td>24.3</td>
<td>9</td>
<td>3.0</td>
<td>25</td>
</tr>
<tr>
<td>Achievement tests</td>
<td>171</td>
<td>21.2</td>
<td>8</td>
<td>2.6</td>
<td>31</td>
</tr>
<tr>
<td>Alternative assessments</td>
<td>75</td>
<td>9.3</td>
<td>12</td>
<td>4.0</td>
<td>12</td>
</tr>
<tr>
<td>Observations</td>
<td>9</td>
<td>1.1</td>
<td>40</td>
<td>13.2</td>
<td>15</td>
</tr>
</tbody>
</table>

3.8. Data analysis methods

Table 9 shows the distribution of the data analysis methods by the different indexes. In the quantitative studies, the use of frequencies/percentages/tables (29.7%), and means and standard deviations (15.6%), which are both descriptive analysis techniques, were the most preferred overall. T-tests (10.7%) and ANOVA/ANCOVA (7.2%) were more preferred as inferential techniques. Content analysis was the most preferred qualitative technique.

Table 6
Distribution of the sample selection methods by the journal indexes.

<table>
<thead>
<tr>
<th>Sample selection types</th>
<th>SSCI</th>
<th>%</th>
<th>SCI</th>
<th>%</th>
<th>ERIC</th>
<th>%</th>
<th>TOTAL</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purposive</td>
<td>307</td>
<td>44.0</td>
<td>20</td>
<td>71.4</td>
<td>130</td>
<td>56.2</td>
<td>457</td>
<td>47.8</td>
</tr>
<tr>
<td>Convenience</td>
<td>243</td>
<td>34.8</td>
<td>7</td>
<td>25.0</td>
<td>63</td>
<td>27.2</td>
<td>313</td>
<td>32.7</td>
</tr>
<tr>
<td>Random</td>
<td>124</td>
<td>17.7</td>
<td>1</td>
<td>3.5</td>
<td>36</td>
<td>15.5</td>
<td>161</td>
<td>16.8</td>
</tr>
<tr>
<td>Census</td>
<td>19</td>
<td>2.7</td>
<td>–</td>
<td>–</td>
<td>2</td>
<td>0.8</td>
<td>21</td>
<td>2.2</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>0.5</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>4</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Table 7
Cross tabulation of the sample populations and research subjects.

<table>
<thead>
<tr>
<th></th>
<th>Educational environments and technology</th>
<th>Distance education</th>
<th>Multimedia and performance</th>
<th>Education and performance</th>
<th>Teacher training</th>
<th>Research and theory</th>
<th>Design &amp; development</th>
<th>Systemic change</th>
<th>Administration</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preservice teachers</td>
<td>112</td>
<td>24</td>
<td>30</td>
<td>22</td>
<td>68</td>
<td>23</td>
<td>14</td>
<td>1</td>
<td>–</td>
<td>13</td>
<td>307</td>
</tr>
<tr>
<td>Other undergraduate students</td>
<td>61</td>
<td>42</td>
<td>20</td>
<td>14</td>
<td>1</td>
<td>11</td>
<td>14</td>
<td>2</td>
<td>–</td>
<td>6</td>
<td>171</td>
</tr>
<tr>
<td>K-12 Teachers</td>
<td>65</td>
<td>10</td>
<td>1</td>
<td>27</td>
<td>22</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>143</td>
</tr>
<tr>
<td>Secondary (9–12) students</td>
<td>52</td>
<td>2</td>
<td>8</td>
<td>13</td>
<td>–</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td>Primary (6–8) students</td>
<td>47</td>
<td>–</td>
<td>16</td>
<td>7</td>
<td>–</td>
<td>9</td>
<td>9</td>
<td>–</td>
<td>–</td>
<td>3</td>
<td>91</td>
</tr>
<tr>
<td>Faculty members</td>
<td>19</td>
<td>13</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>–</td>
<td>1</td>
<td>4</td>
<td>59</td>
</tr>
<tr>
<td>Primary (1–5) students</td>
<td>25</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>–</td>
<td>6</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>Graduate students</td>
<td>13</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Administrators</td>
<td>11</td>
<td>3</td>
<td>–</td>
<td>3</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>3</td>
<td>–</td>
<td>22</td>
</tr>
<tr>
<td>Early Childhood students</td>
<td>6</td>
<td>–</td>
<td>2</td>
<td>1</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Parents</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>–</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>11</td>
</tr>
<tr>
<td>Others</td>
<td>29</td>
<td>28</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>16</td>
<td>8</td>
<td>2</td>
<td>–</td>
<td>9</td>
<td>111</td>
</tr>
</tbody>
</table>

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4. Discussion and conclusion

In this study, 1151 Educational Technology studies, conducted by authors from Turkey, published in 94 international journals indexed in the SSCI, SCI, and ERIC, were examined to analyze the numbers published in each journal, their research subjects, research methodologies, research methods, sample populations, methods of sample selection, sample sizes, and data analysis methods.

The number of articles published from 1990 to 2011 is highest in TOJET within the SSCI index, in IEEE Transactions on Education within the SCI index, and in TOJDE within ERIC. The high number of articles in the journals TOJET and TOJDE may be due to the fact that these journals are published online and have more issue yearly. Moreover, these journals focus on only Educational Technology research. Another reason may be that researchers demand journals from Turkey more frequently (Goktas et al., 2012; Sert, 2010).

Regarding the distribution of article subjects by the three indexes, the most popular subjects in studies indexed within the SSCI were educational environments and technology, distance education, and multimedia. In the SCI, educational environments and technology, design and development, and multimedia were the most popular subjects. And in ERIC, distance education, educational environments and technology, and education and performance were the most numerous subjects. It is also reported in the literature that the subjects of educational environments and technology, distance education, and multimedia are frequently addressed (Alper & Gulbahar, 2009; Caffarella, 1999; Erdogmus, 2009; Goktas et al., 2012; Hew et al., 2007; Ma, 2000; Masood, 1997; Ross et al., 2010; Simsek et al., 2008). The percentage of studies on design and development was higher in the SCI than other indexes. This is likely because the focal subject matter covered in these journals is design and development. Overall, there is variation in the subjects across the indexes, with the result that the three indexes present a diverse range of research concerning Educational Technology.

Quantitative methodology was most frequently used in Educational Technology research in the indexed articles, followed by qualitative, other category (literature review and meta-analysis) and mixed studies. In other analytical surveys of Educational Technology publications, this finding has often been noted (Alper & Gulbahar, 2009; Bozkaya et al., 2012; Hannafin & Young, 2008; Ross, Morrison, & Lowther, 2010). However, qualitative methodology has been more frequently used in recent years (Goktas et al., 2012; Kelly & Lesh, 2000; Masood, 1997). When the number of articles on Educational Technology in the years 1990–2011 was examined, the number published prior to 2001 was very few; but there was a steady increase after 2001. The number of articles also increased significantly after 2007. This may be due to the fact that the first undergraduate students in the field to receive their degrees from the newly opened Computer and Instruction Technology departments in Turkey did so in 2002. Some of these students went on to earn their PhD degrees in 2007, and then carried out and published academic studies.

When the research methods used in the studies were examined, it was found that non-experimental methods were the most preferred in quantitative studies (this category also had the highest overall percentage), and case study was the most preferred in qualitative studies. Experimental methods were less popular, possibly because designing experimental studies is difficult and time-consuming (McMillan & Schumacher, 2010). The survey, quasi-experimental, case study and literature reviews methods were all used preferentially in the articles within the SSCI. The case study and descriptive methods were the most frequently used in the articles listed within the SCI and ERIC. According to this result, quantitative methods were preferred more in the SSCI indexed articles, and qualitative methods were more common in the other indexes.
When the distribution of research methodologies by subjects was examined, the subject which was most researched in qualitative, quantitative and mixed methodologies was educational environments and technology. While distance education was the most researched subject in other category, second most researched subject within the qualitative and quantitative methodologies, and teacher training was next in the mixed studies. Goktas et al. (2012) also reached similar results in their study. The fact that teacher training was the second most studied subject in the mixed studies was possibly due to the fact that this sample group is more easily accessible for researchers.

When sample populations were compared against research subjects, preservice teachers especially and also other undergraduate students were the most preferred sample groups. Other findings reported in the literature support this result (Akca-Ustundag, 2009; Alper & Gulbahar, 2009; Goktas et al., 2012; Simsek et al., 2009). In general, preservice teachers and teachers were commonly used in research on educational environments and technology. Other undergraduate students were used for distance education subjects; and preservice teachers were used for multimedia, education and performance, teacher training, and design and development subjects. This may be explained by the fact that researchers have tended to conduct studies concerning problems which are close to their interests. Researchers probably accessed these sample populations because they were most suited to the types of inquiry being conducted (Goktas et al., 2012).

Among the data collection tools used in the studies, questionnaires were used the most, followed by documents, and attitude, perception, personality, and aptitude tests. Questionnaires and the attitude, perception, personality, and aptitude tests were most frequently preferred in quantitative studies. Interviews, documents, and questionnaires were frequently preferred in qualitative studies. And questionnaires and interviews were most commonly used in mixed studies. In previous analytical surveys, questionnaires and interviews were found to be the most preferred data collection tools (Akca-Ustundag, 2009; Alper & Gulbahar, 2009; Bozkaya et al., 2012; Goktas et al., 2012; Hew et al., 2007; Simsek et al., 2009). Questionnaires were likely used with the greatest frequency because they are a cheap, easy, and fast data collection tool (Baker, 2003).

Regarding the types of sample selection, the purposive and convenience types were mainly used. Other findings in the literature also support this result (Akca-Ustundag, 2009; Alper & Gulbahar, 2009; Goktas et al., 2012; Simsek et al., 2009). The types of sample selection did not differ among the three indexes. Regarding the distribution of sample sizes compared to methodologies, 31–100 samples were typically used in quantitative, mixed and other category studies, and 11–30 samples were most often used in qualitative studies. Of particular concern is the impact of having a small sample in studies that show no statistically differences or relationships, especially because so many educational studies employ relatively small samples. However, whenever there is a small sample; other factors have a greater likelihood of influencing the results, such as bias in the sample or the presence of confounding variables (McMillan & Schumacher, 2010). The number of studies conducted with more than 1000 samples was low for all three methodologies. The low number of quantitative studies with more than 1000 samples may be due to time restrictions, official and ethics processes, and the fact that researchers aim to acquire data over shorter periods of time and as easily as possible (Erdogmus, 2009; Goktas et al., 2012).

Descriptive statistics, which is a quantitative method, was frequently used in all the indexed articles. Frequencies, percentages, and tables were the most preferred types of descriptive statistics. These techniques were followed in popularity by means and standard deviations. T-tests and ANOVA/ANCOVA were the most commonly used methods among the predictive statistics in all three indexes. Content analysis was frequently used in qualitative research studies. Various studies in the literature show similar results (Hsieh & Shannon, 2005; Keser & Özcan, 2011; Masood, 2004; Simsek et al., 2009).

To summarize, the present study is more comprehensive, compared to previous studies on Educational Technology research trends conducted in Turkey, because it surveys a far greater number of articles and different index types. This range of studies published between the years 1990–2011 more fully reflects the developments and changes in the field. The publishing policies of journals are important in shaping the research field of Educational Technology. Hence, revealing research trends by the three indexes will contribute to shaping the field. Finally, the following conclusions and suggestions can be made in the light of the findings obtained from the present study:

- Canalizing researchers in the field whose works appear in leading specialist journals can make important contributions to the development of the Educational Technology field.
- Focus on the less studied subjects can contribute to the development of the field. The three subject areas of design and development, systemic change, and administration in particular could be more comprehensively studied.
- Qualitative and mixed methodologies could be used more in following the administrative trends in the field. These methodologies could further our knowledge by facilitating a more in-depth examination of different cases. Researchers may need to become more knowledgeable about qualitative and mixed methodologies in order to conduct these types of studies.
- Research methods which are never used or which are less preferred (single subject, ex-post fact, historical analysis, cultural analysis, concept analysis, secondary data analysis, critical study, grounded theory, etc.) can be addressed more in post-graduate research methodology courses, to encourage more frequent usage.
- Purposive and convenience samples were preferred in the studies. But a random sample selection method is preferable for generalizing research results.
- Studies on samples from different fields and from a wider variety of groups may help to expand the relevance of study results.
- Increasing the number of samples may help to produce studies with a lower rate of error.
- Choosing statistical analysis methods which are more appropriate for the data would lead to more reliable results.
- A more detailed examination could be made to determine the subject trends in the field of Educational Technology.
- Repeating this type of study periodically would allow researchers to be better informed and to keep updated concerning trends in the field.

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