Published Science Education Articles in E-journals: Method Analysis

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SYNOPSIS

INTRODUCTION

The contribution of scientific researches on education is directly related to the quality of these researches. The inquiry of the knowledge about the quality and quantity of the researches is important to imply the quality of the researches. Furthermore, the researches contain explanatory and important knowledge for the science education researchers.

The qualitative and quantitative methods used in scientific researches can be categorized under four main subtitles such as i) descriptive ii) experimental iii) analytic and iv) interpretive (Çepni, 2010). Moreover, it has often been seen that both qualitative and quantitative methods have been used together in the same researches recently. These researches are called as mix type method (Creswell, 2003). The schematic display of these scientific research methods is in the Figure 1.

PURPOSE OF THE STUDY

The purpose of the study is to determine the articles published in e-journals which have been published for more than five years with referees and open access in our country and to find out with which methods are used in these articles.
METHODOLOGY

This study is carried on using documentary analysis which is accepted as one of the analytic research methods. The answers about constructed main and sub questions for the purpose of this study are seek below respectively.

Research Question:
What are the scientific methods used in articles in national e-journals published between 2004 and 2010?

Sub Questions:
1. What is the distribution of the scientific methods of the published articles in the mentioned years according to the years?
2. What is the trend of methods of published articles in mentioned years related to the years?

While answering the questions the independent variables are considered relating to their number of authors, methods and the year they are published. For the classification of the methods of the published articles, the classification method of Çepni (2010) is used.

Selection of Journal:
Four e-journals published science education articles were selected for the investigation which are nationally published with referees, accessed only on the net with open access and for more than five years background.

The selected journals and their web site addresses are given below:

✓ Journal of Turkish Science Education (TUSED), http://www.tused.org
Elementary Education Online (EEO), http://ilkogretim-online.org.tr
Turkish Online Journal of Educational Technology (TOJET) http://www.tojet.net
Journal of Theory and Practice in Education (JTPE) http://eku.comu.edu.tr

FINDINGS

First, how many articles in the investigated journals contain science education articles and the obtained data is presented relating to question of the research and their demographic knowledge of the published articles about how many authors they had and how many of them belong to science education respectively.

The demographic knowledge of the published articles in investigated e-journals:

It is determined that 173 of 749 articles are about science education articles between 2004-10 in the investigated four e-journals with open access in Turkey. The number of science education articles consists of 23% of the total articles. The distribution of published articles is shown in Table 1 according to their numbers and years.

Table 1. Distribution of number of articles published in four electronic journals by years

<table>
<thead>
<tr>
<th>Journal</th>
<th>Article Area</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUFED</td>
<td>Science Education</td>
<td>10</td>
<td>9</td>
<td>15</td>
<td>13</td>
<td>17</td>
<td>24</td>
<td>6</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>All Article</td>
<td>10</td>
<td>10</td>
<td>17</td>
<td>16</td>
<td>24</td>
<td>30</td>
<td>8</td>
<td>115</td>
</tr>
<tr>
<td>İOO</td>
<td>Science Education</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>13</td>
<td>7</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>All Article</td>
<td>9</td>
<td>13</td>
<td>16</td>
<td>37</td>
<td>58</td>
<td>74</td>
<td>32</td>
<td>239</td>
</tr>
<tr>
<td>TOJET</td>
<td>Science Education</td>
<td>6</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>All Article</td>
<td>80</td>
<td>75</td>
<td>45</td>
<td>35</td>
<td>32</td>
<td>32</td>
<td>26</td>
<td>325</td>
</tr>
<tr>
<td>EKU</td>
<td>Science Education</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>All Article</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>8</td>
<td>70</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Science Education</td>
<td>18</td>
<td>23</td>
<td>20</td>
<td>26</td>
<td>32</td>
<td>39</td>
<td>15</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td>All Article</td>
<td>99</td>
<td>102</td>
<td>85</td>
<td>104</td>
<td>131</td>
<td>154</td>
<td>74</td>
<td>749</td>
</tr>
<tr>
<td></td>
<td>Science Education / All Article</td>
<td>0,18</td>
<td>0,23</td>
<td>0,24</td>
<td>0,25</td>
<td>0,24</td>
<td>0,25</td>
<td>0,20</td>
<td>0,23</td>
</tr>
</tbody>
</table>

When examined Table 1, it is clearly seen that TUSED contained the most science education articles with the number 94 within the years investigated whereas 4 articles were published in JTPE. 82% of the total articles in TUSED were about on science education and it covers 54% of the investigated science education articles. Towards the recent years, the number of published science education articles has increased and it covers 25% of the total articles in this study.
Figure 6. Distribution of methodology of articles published in four electronic journals by years

Seen in Figure 6, ten different methods were used in 173 research articles published between 2004-10 in all investigated journals. It was determined that experimental design method was used in 31% and survey method in 21% of these articles which means that these two methods covered more than half of them. On the other hand, developmental, action and phenomenographic methods were used in approximately 3% of the total published articles. The methods were not mentioned by the authors in 15% of the total articles. It is pointed out in Figure 6 that the experimental methods were highly preferred in each year in the articles published between 2004-10. Case study, survey and documentary analysis methods were also among the methods used in articles even if they were fluctuated within the years. Although the comparative, developmental, phenomenographic, meta-analysis and mix type methods were rarely used in the articles, they were seen to be used in recent years.

DISCUSSION

173 science education articles published in investigated e-journals between 2004-10 years were carried out using ten different research methods. Quasi-experimental and survey methods were used in half of them. One third of the articles were published using other eight methods whereas the methods could not be determined in one sixth of the total articles. Experimental methods were widely used in most of the articles because it could be derived from the fact that authors determined effectiveness of teaching materials and the validity of
scale based on the teaching activity. Therefore the journals could publish the articles carried out with the effectiveness of the new teaching materials. The great number of articles published using survey method could be originated to determine the present situation by the authors who interested about the subject.

The reason why the survey method was often used in the published articles may result from the fact that most of the researchers can express the present status of the subjects which they are interested in. Asan (2005, p: 240) supported our idea with his statement that “… review articles received two times more citations than the others. Therefore the journals published more review articles, receive more citations…” for the review articles mostly written by survey method.

Comparative, developmental, phenomenographic, meta-analysis and mix type methods which were seldom used in previous years have started to appear in the articles published in recent years. The reason why these research methods are often used in the published articles can depend on the increasing number of science educators and their desire to use different research methods in their studies.

Generally, approaching from 2004 to nowadays it can be said that the number of research method types used in the published articles investigated in four e-journals has increased. Besides this the most of the published articles whose research methods were not clarified were published in TUSED and EEO journals. The reason can be originated from the related journals’ referees who neglect or overlook the methods of the published articles. However, it is necessary for the scientific articles to clarify the research methods used in them (Day, 2000).

**CONCLUSION and RECOMMENDATIONS**

It is concluded that the number of published articles about science education has been increasing in the four investigated open access e-journals in Turkey between 2004-10. It is seen that experimental method was often used in the investigated articles. Among the investigated journals most of the science education articles were published in TUSED due to its publishing policy. The number of journals which will publish science education articles should be increased.

When the published articles investigated, it is determined that the articles generally have one or two authors. Especially, the articles with a single author were published in TOJET which is indexed in Social Science Citation Index (SSCI). Such a status can depend on the academic promotion system existing in our country. It is necessary to publish an article with a single author in a journal which is indexed in SSCI to receive an academic promotion for science education in our country. It has been marked that the methods of 26 of 173 published articles investigated in four e-journals were not clearly written. The editors or referees should consider the research methods of articles as an important criterion before the articles are accepted for the publication.
REFERENCES


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