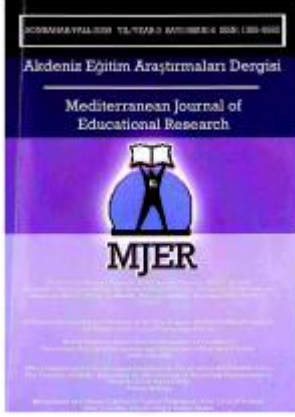


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## The Profile of Turkey within the Articles Indexed in SSCI in the Field of Education: The Case of Chemistry Education

Burcu Umut ZAN\*, Nuray ZAN\*

**Abstract:** Academic publications have recently increased in number recently in Turkey (Glänzel, 2008). Looking at this increase, academic publications have been selected as the topic of this study and a bibliometric analysis was made. In bibliometric studies, where quantitative methods are applied to knowledge resources, data obtained from the reference indexes are evaluated through mathematical and statistical methods (Forsman, 2008). In the study, the general profile of Turkey between years 1945 and 2011 was determined in terms of articles containing education, from Social Science Citation Index (SSCI) listed under Web of Science (WoS) reference database. Articles on chemistry education were selected out of this data and evaluated. The articles indexed under the topic of chemistry education between the years mentioned above, were evaluated according to the increases in number in years, publishing universities and publishing journals. In this respect, 1880 articles were analyzed from the list indexed under the title of education. The number of articles were found to increase in years and Hacettepe University was determined to be the university with the highest number of articles in education. The most favored journal was found to be the Journal of Educational Sciences in Theory and Practice. Similar results were obtained for chemistry education and they were evaluated based on the education policies.

*Keywords:* Article production, chemistry education, Turkey.

### *Web of Science/ Social Science Citation Index*

Institute for Scientific Information (ISI), founded by Eugene Garfield has catered for reference indexes for over 50 years (Thomson Corporation, 1992). Web of Science (WoS) is a comprehensive research platform within the scope of ISI. Thanks to this resource, articles on science, social sciences, art and human sciences are easily accessed. After its foundation, ISI published the Science Citation Index (SCI), which contains scientific journals in the field of basic sciences. After SCI, Social Science Citation Index (SSCI) involving the reference index of social sciences and Art & Humanities Citation Index (A&HCI), where topics related to art and human sciences were published in turn. SSCI contains more than 4,500 journals on more than 50 disciplines published after 1900 (Thomson Reuters, 2012). Databases and journals within WoS could be scanned under the topic titles. In determining the titles, the scientific content of the journal is primarily considered. Additionally, the references to the articles published in journals are grouped and similar groups were categorized as the second priority in determination of the titles (Moed, 2005, p. 188). However, sometimes same journals could be listed under more than single titles. For instance, the Journal of Research in Science Teaching is listed only under the title of Education and Educational Research while the Journal of School Health is indexed under Education and Education Research, Health Sciences and Services, Public, Environmental and Labor Health titles. Journals within the SSCI database are categorized under 56 titles. Articles on education and educational research are indexed within the SSCI under the title of Education & Educational Research. This title contains various journals within a wide selection of fields from theory to practice. Apart from the resources related to pedagogy and methodology, there are also journals

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with different features such as the history of education, curriculum studies, education policies, education administration, education programs, education sociology and economy, assessment and evaluation as well as computer utilization (SSCI, 2012). All publications under the related title shall be referred to as Education Sciences.

### ***Education Faculties in Turkey***

The first education faculty in Turkey is Ankara University, Faculty of Education founded in 1965 (Ankara University, 2012). Teacher training institutions were then named as *Institutes, Teacher Schools* in Turkey. The history of Gazi Education Faculty goes back to “Secondary Teacher School and Training Institute” founded in 1926, which was later named as “Gazi Secondary Teacher School and Training Institute” in 1929 and as “Gazi Education Institute” in 1976. It was then changed into “Gazi High Teacher School” in 1980, being a four-year training institution. After its relocation to Gazi University in 1982, it reached its final name as “Gazi Education Faculty” (Gazi University, 2012). According to the data obtained from Higher Education Institution (YOK), there are a total of 168 universities in Turkey, 103 of which are government and 65 of which are private foundation universities. As well, 94 of these universities involve education faculties (YOK, 2012). While 8 of the education faculties are inactive, 86 of them are actively training teachers. The purpose of the Secondary Level Science and Math Education (SLSME) departments of universities is to train qualified math, physics and chemistry teachers. The SLSME departments in education faculties with chemistry teaching sections are 40 in number. While 23 of these are actively training teachers, 17 of them are inactive. Additionally, 37 of these 40 universities train in Turkish whereas the Middle East Technical University (METU) and Bosphorus University train in English and the language of teaching at Hacettepe University is German.

### ***The Purpose of the Study***

This study involves all articles indexed within SSCI between years 1945 and 2011 under the title of “education and educational research” originating from Turkey. The journals were analyzed with the aim of determining the general profile of articles and answers to the following questions were sought. “What is the distribution of articles per year? What are the article production rates of the universities? What is the distribution of the journals that related articles were published?”

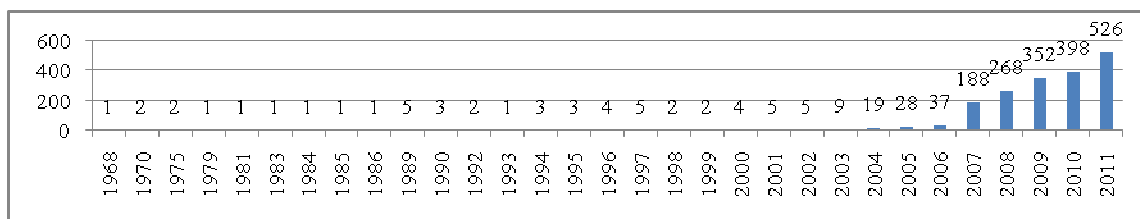
After the general profile of Turkey in terms of the above-mentioned questions is determined, the following questions were sought to be answered for the articles indexed for chemistry education. “What is the distribution of chemistry education articles per year? What is the distribution of chemistry education articles according to publishing universities and journals?”

The purpose of the study is to search whether studies on chemistry education are parallel to the studies on education in Turkey in terms of increase in the number of articles, universities producing the articles and journals that the articles are published in.

## **Findings**

All articles indexed within SSCI between years 1945 and 2011 under the title of “education and educational research” originating from Turkey are involved in the study. The first phase of the analysis consisted of the general profile of Turkey. Data obtained from WoS and SSCI were stored in Excel, analyzed in Bib excel for bibliometric analysis and evaluated through Pajek as a data evaluation tool with networks. The research concluded that there were 1880 articles indexed at SSCI under the title of “education and educational research” between years 1945 and 2011. As displayed on Graph 1, the very first Turkish origin publication indexed under education title on SSCI is dated 1968. The

article called “Universities in Turkey” was written by Osman Okyar at Hacettepe University and was published in Minerva Journal.



Graph 1: Number of articles indexed at SSCI according to years

Another striking point in Graph 1 is that the number of articles indexed increases rapidly after 2007. The increase rate of the articles published between 2007 and 2011 indicates that the number increases rapidly in years and the average increase in 5 years is calculated as 0,3. It is thought that the increase in the number of education-related articles in Turkey after 2007 started as Turkish journals and educational articles began to be scanned by WoS and SSCI. Table 1 displays the distribution of indexed articles under education title according to journals.

Table I  
The distribution of indexed articles in SSCI according to journals

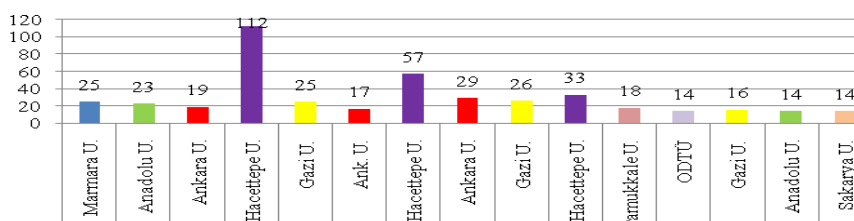
Journals	1968-2006	2007	2008	2009	2010	2011	Total
Education Sciences in theory and Practice	0	39	31	50	62	114	296
Hacettepe University Journal of Education Faculty	0	39	55	47	50	72	263
Education and Science	0	24	38	51	53	94	260
Educational Research	0	45	33	45	46	47	216
Turkish Online Journal Of Educational Technology	0		23	21	42	59	145
Computers & Education	4	2	12	15	11	12	56
New Educational Review	0		3	13	12	15	43
Educational Technology & Society	17	4	8	4	3	1	37

The total indicates that the 1180 of the 1880 articles published between years 1945 and 2011 indexed in SSCI belonged to the period years 2007 and 2001 from five journals in Turkey. In other words, the entry of the Turkish journals to the index increased the number of articles from Turkey. The years when the journals started to be scanned in index and the number of articles are listed in Table 2. The data presented in Table II are taken from WoS on 3<sup>rd</sup> September 2012.

Table II  
Information on Turkish journals indexed in SSCI

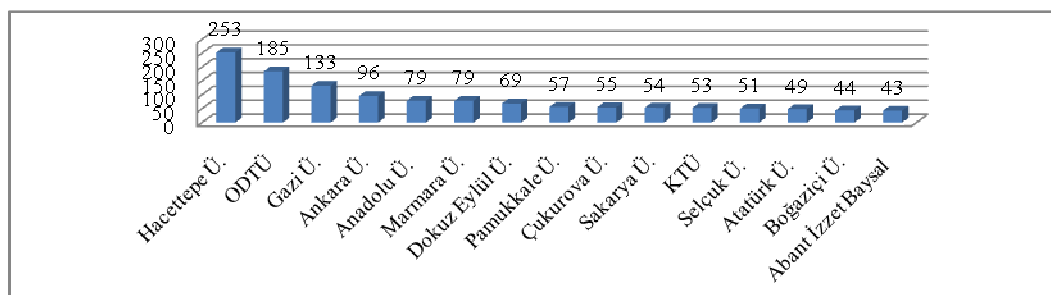
Name of Journal	Starting date of indexing	Number of indexed articles
Education Sciences in Theory and Practice	2007	401
Hacettepe University Journal of Education Faculty	2007	308
Education & Science	2007	330
Eurasian Journal of Educational Research	2007	279
Turkish Online Journal Of Educational Technology (TOJET)	2008	301

Hacettepe University Journal of Education Faculty in Table II is a journal that belongs to the university. Apart from this journal, TOJET is supported by Sakarya University (TOJET, 2012). Accordingly, the institutional origins of the articles published in journals mentioned in Table II were analyzed along with the supporting universities. Graph 2 was created on the three universities with high number of articles, where the contribution of Hacettepe University is rather striking. The number of articles from supporting universities in other journals was found to be close in number while Hacettepe University Journal of Education Faculty displayed a different profile.



Graph 2: Distribution of universities contributed with articles to the journals

The producing universities of educational articles, which are 1880 in number were determined and displayed in Graph 4. The pioneering university in this respect was Hacettepe University with 253 articles, while METU came second with 185 articles and Gazi University with 133 articles.



Graph 3: Distribution of articles with education science topics indexed in SSCI according to universities

The second phase of our study consisted of the determination of articles published under the subtitle of chemistry education in the mentioned period. In determination process, keywords were made use of, while 192 articles without keywords were scanned according to their titles and abstracts. "Chemistry", "chemistry education" and "chemical" were the keywords scanned which resulted in the number of 49. Their distribution according to years is displayed on Table III.

Table III

The number of chemistry education articles scanned in SSCI according to years

Year	1996	2005	2006	2007	2008	2009	2010	2011
Article	1	1	1	3	11	13	8	11

The number of articles indexed in SSCI on chemistry education increased after 2007 and 16 of these articles were found to be published in Turkish journals. Their distribution according to journals is listed in Table IV.

Table IV

Distribution of chemistry education articles scanned in SSCI according to journals

Name of Journal	Number of Articles
Hacettepe University Journal of Education Faculty	7
Chemistry Education Research And Practice	6
Education&Science	6
International Journal Of Science And Mathematics Education	5
International Journal Of Science Education	5
Journal Of Baltic Science Education	4
Journal Of Science Education And Technology	4
Research In Science Education	4
Computers & Education	2
Educational Research	2
Asia Pacific Education Review	1

Etr&D-Educational Technology Research And Development	1
European Journal Of Teacher Education	1
Educational Sciences in theory and Practice	1

Articles were evaluated in terms of the topic titles of the journals they were published in and the 96% of the articles were found to be published in journals with *education and educational research* topic titles. Four percent were indexed commonly under both *education and educational research* and *computer sciences*. Articles under the subtitle of chemistry education were reevaluated in terms of their contents. The most studied chemistry topics in related articles were listed as respectively; solutions, chemical reactions, chemical bonding, chemical equilibrium, chemical concepts, electrochemistry, gases, chemistry curricula and laboratory applications. Most of these studies were carried out with the implementation of different methods and techniques to the chemistry topics. The student groups taken to the application were consisted from secondary school students, high school students and university students. Most of the applications taken to the high school level were applied to the 10th classes and all of the secondary school applications applied to the 7th classes. As well as, teachers and teacher candidates, only for one study, faculty members being situated in the field of chemistry education was carried out in these studies. At the same time, success, attitude, evaluation studies on faith and the studies in the field of evaluation and measurement were placed in these articles.

Articles indexed in SSCI under the subtitle of chemistry education, which are 49 in number, were analyzed in terms of their origins and the producing universities were determined to be METU (11), Blacksea Technical University (10), Ataturk University (6) and Hacettepe University (5).

### Conclusions

It is a prerequisite for the promotion and appointment criteria of academicians to publish a single-author article in arbitrated journals within the SSCI, SCI-E, AHCI or related international field indexes (UAK, 2012). In this case, there is not an obligation to publish only in SSCI-indexed journals causes the number of articles to be low in this index. TUBITAK (Turkish Institute of Scientific and Technological Research), in 2006, started to support articles in not only the field of positive sciences but also the articles in the fields of social and human sciences. Additionally, authors were authorized to apply online in 2007 (TUBITAK, 2012). In other words, this program applied by TUBITAK is considered to have contributed to the increase. The increase in the number of articles indexed in SSCI is supportive of this state. Moreover, as the Turkish journals started to be scanned in the related index, the increase in the number of articles was experienced. Looking at the number of articles scanned in the index, the dominance of Turkish journals could be observed. Therefore, with the inclusion of Turkish journals in the index and the increase in TUBITAK incentives both the number of articles with educational topics and the number of articles on chemistry education increased. Articles produced under the subtitle of chemistry education are found to be similar with the articles on education; however, differences were observed in the journals preferred. 0.3% of the articles on chemistry education were published in Turkish journals, while 0.6% of articles on education in general were published in Turkish journals. The most effective universities in article production on education are found to be Hacettepe University, METU and Gazi University. The number of articles from Hacettepe University indexed in Hacettepe University Journal of Education Faculty was high in number due to the advantage of having the original journal of an institution. Looking at the number of contributing academicians, the number of articles produced by the academicians of Hacettepe University was found to be higher than other institutions. In terms of articles under the title of chemistry education, the most productive universities were found to be METU, KTU (Blacksea Technical University) and Ataturk University.



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