



## Turkish Studies

Language / Literature

Volume 13/20, Summer 2018, p. 845-853

DOI Number: <http://dx.doi.org/10.7827/TurkishStudies.14108>

ISSN: 1308-2140, ANKARA-TURKEY

Research Article / Araştırma Makalesi

---

---

### Article Info/Makale Bilgisi

✍ Received/Geliş: Eylül 2018

✓ Accepted/Kabul: Eylül 2018

👤 Referees/Hakemler: Prof. Dr. Mehmet Dursun ERDEM – Doç. Dr. Muhammet KOÇAK – Dr. Öğr. Üyesi Lokman TANRIKULU

---

---

*This article was checked by iThenticate.*

## TANZİMAT DÖNEMİNDE OSMANLI ÇEVİRİ ETKİNLİĞİ

Mine YAZICI\*

### ÖZET

Türkçe, 1342'de Osmanlı İmparatorluğunun kuruluşundan 1839'da Tanzimat dönemine kadar konuşma dili olarak kabul görmüştür. Buna göre, bu makalenin ana soruları şöyle sıralanabilir: İlk olarak, Türk dili bilimseldil olarak niçin kabul görmemiştir; İkincisi, Türkçe konuşma dili bilimsel bir dile dönüşene kadar çeviri etkinliği açısından tarihsel hangi aşamalardan geçmiştir? Son olarak uzun süre yabancı dillerin üstünlüğünün ardından sonra çeviri etkinliğinin terminoloji oluşumunda etkisi ne olmuştur. Osmanlı İmparatorluğunun hüküm sürdüğü dönemde Türkçe, Arapça ve Farsça kelimeler veya terimlerden oluşan Osmanlı Türkçesi resmi ve bilimsel dil olarak kullanılmıştır. Özellikle yüksek öğrenim kurumları olan medreselerde bilimsel olarak Arapça müfredatlarının şekillenmesinde temel alındığından olarak eğitim dili çoğunlukla Arapça olmuştur. Ancak, İmparatorluğun askeri ve ekonomik çöküşü, Osmanlı aydınlarının zamana ayak uydurmak ve başka uluslar arasında hayatta kalmak Batı bilimine yönelmesine yol açmıştır. Buna göre, bu yazı Türk dili dilinin, Osmanlı bilim tarihinde çeviri etkinliği açısından bilimsel bir dile nasıl dönüştüğünü incelemektedir. Buna göre, Türk terminoloji oluşumunun temellerinin yanı sıra Türk bilimsel dilinin temellerini atan üç faktör şöyle sıralanmıştır: Yeni kurulan saray ya da sivil askeri ya da tıp yüksek okulları, İmparatorluk himayesinde ya da sivil olarak kurulan bilimsel akademiler ve ders kitaplarıyla ilgili çeviri etkinliğinin bir uzantısı olarak terminolojik çalışmalar ya da Osmanlı bilimsel akademiler tarafından çıkartılan bilimsel dergiler şeklindeki yayına dönük faaliyetlerdir.

**Anahtar Kelimeler:** Tanzimat dönemi, çeviri etkinliği, Saray okulları, Osmanlı bilim akademileri, çeviri işlemleri.



\* Prof. Dr., İstanbul Üniversitesi Edebiyat Fakültesi İngilizce Mütercim Tercümanlık Anabilim Dalı, El-mek: mineyaz@gmail.com

---

## THE OTTOMAN TRANSLATION ACTIVITY IN THE REFORMATION PERIOD

### ABSTRACT

Turkish was acknowledged as a colloquial language since the foundation of the Ottoman Empire in 1342 up till the Reformation period in 1839. Accordingly, the main questions of this paper can be enlisted as follows: first, why Turkish language has not been considered appropriate for scientific language; Next, what stages Turkish colloquial language has gone through in developing into a scientific language in terms of translation activity in history, and finally what was the impact of translation activity in terminology formation after the long ages of the supremacy of foreign languages. During the reign of Ottoman Empire the official and scientific language was maintained in Ottoman Turkish, which was mainly composed of Turkish, Arabic and Persian words, or terms. The medium of education especially in madrasas, which were institutions of higher education during the reign of Ottoman Empire, was mainly Arabic since Arabic scientific knowledge was assumed as a basis in shaping the curriculums of madrasas. However, the military and economic decline of the Empire compelled the Ottoman intellectuals to orientate towards the Western knowledge to keep with the times, and survive amongst other nations. Accordingly, this paper studies in what way Turkish colloquial language develop into Turkish scientific language within the coverage of translation activity in Ottoman science history. The three factors that laid the foundations of Turkish terminology formation as well as Turkish scientific language is subsumed under three categories. They are newly founded imperial or civil colleges, state run or civil scientific academies, and publications in the form terminological studies as an extension of the textbooks and scientific journals issued by Ottoman scientific academies, respectively.

### STRUCTURED ABSTRACT

This paper aims to disclose what stages Turkish scientific history and Turkish scientific language have gone through after the military and economic decline of the Ottoman Empire in the 18<sup>th</sup> century up till the foundation years of the Turkish Republic as well as the impact of translation activity on the development of Turkish scientific language. Accordingly, it tries to find answers to the following questions concerning the underlying factors that caused Turkish to remain as a colloquial language for centuries. The first question is what sort of translation activity was held in the Reformation Period; the second question was why the Ottoman intellectuals remained under the hegemony of Arabic and French languages in maintaining scientific correspondence. In other terms, it questions the impact of translation activity in turkifying the Ottoman scientific language, which ended in the development of Turkish scientific language. Within this framework, it first deals with the motives that drove the Ottoman intellectuals to reverse their direction from the Arabic scientific tradition to the Western scientific conventions. Second, it studies the reasons that compelled the Ottoman intellectuals of the

---

Reformation period to search for the Turkish equivalents of technical loan terms of Arabic or French origin.

The Arabic scientific terms were used approximately 600 hundred years in the Madrasas, and they were acknowledged as established terms in Ottoman scientific language. However, the Ottoman scientists who observed the gap in the field of technology, especially after the scientific and industrial revolution in the West orientated towards the Western languages, especially to French as *Lingua Franca* of the so-called era. In this case, they had to import knowledge from the West after following the Arabic scientific conventions as well as the same cultural and religious heritage for approximately five hundred years. The reversion of the direction of scientific convention ended in terminological chaos since most of the scientific terms were transferred from Arabic language and the medium of education was Arabic.

The main debates on terminology formation started with the Reformation Period in 1839 and lasted even after the foundation of Turkish Republic in 1923, up till the first half of the 20<sup>th</sup> century. The orientation to the West ended in huge number of loan words and new terminological coinages (neonyms) in Turkish scientific language since it was difficult to keep up-to-date with the technological advances recorded in the West since the Industrial Revolution in the mid-18<sup>th</sup> centuries. Accordingly, we can claim the issue of Turkish scientific language came up on agenda with the implication of Imperial Edicts of Reformation, which lasted from 1839 to 1876. For this reason, focusing on a certain period of Ottoman Science History may yield us clues why terminological chaos hindered the transfer of technological advances. Several factors compelled Ottoman intellectuals to discuss the Ottoman scientific language and problematize the transfer of terms. They can be enlisted as follows:

- Newly founded imperial or civil colleges,
- State run or civil scientific academies,
- Publications such as textbooks, scientific journals and terminological works produced as an extension of intensive translation activity.

All these factors were interrelated with each other to structure the Turkish scientific language and terminology. The foundation of imperial or civil colleges Translation activity in the Reformation Period ended in the assignment of foreign professionals and scholars from the West, which ended in the conversion of medium of instruction from Ottoman Turkish, or Arabic to French. For a long period of time, scientific and technological terms were borrowed from Arabic, Greek, Latin, French, or English. All the textbooks written by the academic staff were in French and students had to learn French before starting classes in their field of interest. However, when the state or civil scientific academies opened, the debates on maintaining education in Ottoman Turkish flared. The Ottoman intellectuals discussed the official language and medium of instruction especially in the preparation of the Second Constitutional Monarchy in 1876. In fact, three points of view appeared during these debates; First, those supporting Turkish in Arabic Script, what we call Ottoman Turkish; Next, those supporting French; finally, those supporting Arabic Language as medium of education. After the long

fervent debates amongst the Ottoman intellectuals, they acknowledged Ottoman Turkish as the official language, and the medium of instruction became Ottoman Turkish in spite of the will of Sultan Abdulhamid the Second that scientific language remained in Arabic. Especially Medical civil schools played an important role in Turkifying the medical terms through the medical textbooks written in Ottoman Turkish.

In conclusion, intensive translation activity held in the Reformation period has had a great share in refuting the established conviction lasting for ages that “Turkish is a colloquial language”, thereby not being rich and potential enough to develop into a scientific language. Further studies on terminology formation in Modern Turkish will also prove why Turkish language is as potential as other languages as not only as a scientific language, but also as an academic language.

**Keywords:** The Reformation period, translation activity, imperial schools, the Ottoman scientific academies, tr

With the economic and military decline of Ottoman Empire in the 18th century the Ottomans had to turn their face towards the West so as to follow the technological and scientific advances recorded in the age of Industrial Revolution. There was a big linguistic obstacle on the path to westernization since Turkish was not acknowledged as scientific language of the Ottoman Empire. The cultural hegemony of the Arabs over the Ottomans ended in adopting not only Arabic culture and language but also Arabic scientific and educational system, in shaping the schedules of madrasas, which were institutions of higher education during the reign of the Ottomans. The medium of education was Arabic and Ottoman Turkish then.

The reversion of the direction of scientific convention ended in terminological chaos since most of the scientific terms were transferred from Arabic language. The scientific terms were used approximately 600 hundred years in the Madrasas since the foundation of Ottoman Empire 1299. Arabic scientific terms were adopted as established terms in Ottoman Scientific language. However, Ottoman scientists and intellectuals who observed the gap in the field of technology especially after the scientific and industrial revolution in the West started to orientate towards Western languages, especially to French as *lingua Franca* of the so-called era. The main debates on terminology formation started with the Reformation Period in 1839, and lasted even after the foundation of Turkish Republic in 1923, up till half of the 20<sup>th</sup> century. The orientation towards the West ended in huge number of loan words and new terminological coinages (neonyms) in Turkish scientific language since it was difficult to keep up-to-date with the technological advances recorded in the West.

Turkish scientific language came up on agenda with the implementation of Imperial Edicts of Reformation, which lasted from 1839 to 1876. For this reason, focusing on a certain period of Ottoman Science History may yield us clues why terminological chaos hindered transfer of technological advances, and why foreign terms could not comply with the conditions of Turkish word formation in creating new terms. The historical account of translation activity may illuminate what stages Turkish colloquial language underwent in becoming a scientific language.

### **Translation Activity during the Reformation**

There were several factors that laid the foundations of new scientific approach in Ottoman history. Amongst them, the following three factors can be enlisted as the milestones of new understanding:

-Newly founded imperial or civil colleges,

-State run or civil scientific academies

-Publications such as the textbooks, scientific journals and terminological works produced as an extension of intensive translation activity so as to keeping pace with the Western civilization.

In fact, all these factors were interwoven in such a way as to form causal links with each other to structure the Turkish scientific language and terminology.

### **Newly founded imperial or civil colleges & Translation activity**

For a long period of time in history, scientific terms were borrowed from Arabic, Greek, Latin, French, or English since official language was Ottoman Turkish in Arabic Script (an artificial language composed of Turkish, Arabic, and Persian) and scientific language was peculiar only to Ottoman Intellectuals. The debates on scientific language started in the 18<sup>th</sup> century and lasted until the proclamation of The Imperial Edict of Gulhane by Sultan Abdulmecid in 1839. During that period French became the medium of education alongside Arabic in the newly founded military, imperial and civil colleges. Meanwhile, the official language and medium of instruction was discussed in the preparation of the Second Constitutional Monarchy in 1876. After long fervent debates amongst the Ottoman intellectuals, the official language and the medium of instruction was accepted as Ottoman Turkish in spite of Sultan Abdülhamid II's will of Arabic. Accordingly, the medium of instruction was changed into Ottoman Turkish for the first time in primary and secondary schools (Köksal 2018:10). However, Arabic was still the medium of instruction in Madrasas. On the other hand, French and Italian were accepted as medium of education in military and medical colleges because military or medical experts were assigned from the West as academic staff since 1730s to modernize military techniques and medical services for the army. For example, Baron De Tot was recruited by Ottoman Empire to found Imperial College of Naval Engineering (1783-1789). De Tot and his English colleagues taught mathematics, geometry, topography, algebra, natural sciences, trigonometry, civil engineering alongside military techniques to the artillery men (İhsanoğlu 1998:25-26). All these new subjects of study based on Western knowledge led the Ottoman intellectuals, who held office in these colleges as headmasters, to initiate translation activity in the field of textbooks for Imperial colleges. In 1790 Imperial College of Military Engineering was founded, and Kırmırlı Hüseyin Rıfıkı Tamani was assigned as headmaster to the college. He translated and printed books of thirteen (13) volumes, which were compiled from the Western and French resources (Tekeli&İlkin 1999:29-31). Amongst them *Teşhis ül-Eşkal (1801)* played a pivotal role in terms of introducing Western units of measurements (metric system) and comparing them with the Ottoman equivalents (Günergün 1998: 9-10). After him, Ishak Efendi, who was the student of Hüseyin Rıfıkı Tamani, was recruited to the Imperial College as headmaster. Ishak Efendi published a four volume book titled *Mecmuai-ulum-i Riyaziye (1831-1834)* on mathematical sciences, which was composed of translations and compilations from French resources. Later, Salih Zeki, who introduced modern mathematics and physics to the Imperial Colleges of Navy and Army, was appointed as Rector of Ottoman University of Sciences (Darülfünun) in 1913. He translated Henri Poincare's works on science, scientific methods, philosophy of science, textbooks of algebra as well as Alexy Bertrand's work on philosophy and morals in these years (cf. Kayaoğlu, 1998: 161-175; Ülken, 1997: 334). In addition to these text-books, books on logarithms, chemistry, astronomy, geography and botany were also translated from French into Ottoman Turkish. Translation activity held in the newly founded colleges and the scientific societies ended in debates on terminological problems. However, the debates on terminology enriched and enforced dynamics of Modern Turkish Scientific language and terminology.

### **State run or Civil scientific Academies and Publications**

On the other hand, the scientific societies founded in the 19<sup>th</sup> century have had a great share in introducing Western knowledge to Ottoman intellectuals. Encümen-i Daniş (*Academy of Ottoman*

*Society Knowledge*), was founded in 1850 under the auspices of Ottoman General Education as a state run society. The names of leading Ottoman scientists, the members from the assembly of General Education as well as the honorary European members such as Joseph von Hammer (Historian), James Redhouse (linguist and lexicographer) became the founding members of the society (Elmacı 2017: 77-92). Although the society aimed to set French Scientific Academy as a model, it could not achieve this end. There were two reasons for it: First, they set French and British academies of science, which adopted experimentation in research, as a model; However, Ottoman scientific convention was basically based on contemplative sciences. Second Encümen-i Daniş was a state-run academy as opposed to non-state-run French Scientific Academy. For this reason the society had to assume such responsibility as fulfilling a public service, which ended in preparing textbooks for the newly founded colleges, whose academic staff was mainly composed of foreign professionals, or specialists. Then translating textbooks for higher education became one of its leading missions rather than producing new knowledge based on experimentation. Accordingly, the society published twenty-one (21) books, fifteen (15) of which were translations from French, three (3) of them from Arabic, and six (6) of them were compilations from Western textbooks (Kurultay 1998:20). The second society *Cemiyet-i İlmiye-i Osmaniye (Ottoman Society for Science)* was founded in 1861 by Münif Pasha, just after the scientific activity of Encümen-i Daniş ended in 1860. In *Cemiyet-i İlmiye-i Osmaniye* the members were divided into three groups, full-members, honorary members and corresponding members. As a non-state run society, there was no racial or religious discrimination amongst members. The main requisite of being a member was being a specialist in a specific field of study. The founding objectives of the society, which can be explained as the requisites of being a full member of the society, can be enlisted as follows:

1. Disseminating scientific and technological knowledge as far as possible
2. Issuing a scientific journal called *Mecmua-i Fünun* at the beginning of every month. It was first issued in 1860 and lasted until 1866. Full members were also responsible for writing
3. Concentrating only on scientific knowledge and avoiding religious and scientific issues. (Elmacı 2017:87)

In spite of these well-formulated principles *Cemiyet-i İlmiye-i Osmaniye* could not also achieve its even if it were non-state-run scientific society. However, both societies laid the foundations of higher education by preparing the textbooks for Darülfünun in 1900s. While translating and publishing the textbooks for higher education, they contributed to the shaping of terminology formation by discussing and posing problems in transferring foreign terms.

### **Translation Procedures in Publications**

Translation activities held in these scientific societies ended in questioning the translation procedures in transferring new terms. For a long period of time, the general trend in terminology formation was either “naturalization”, or “derivation”. If the scientist adopted “naturalization” in process as a translation procedure, it ended in full of loan terms from foreign languages. On the other hand, the general tendency in Turkification of terminology was “derivation” since Turkish is open to derive as many words as possible by inserting suffixes to the roots the words as an agglutinative and deductive language. However, they kept the roots of the term in Arabic since scientific jargon was in Arabic in Ottoman scientific convention. Accordingly, they kept the root of the term in Arabic, but inserted the suffixes in Turkish to the root of the term, which ended in “register mismatch”. In this case, the scientists referred to direct “transfer”, or “naturalization”, which means adopting term to the orthography of Ottoman Turkish if the term was imported from the Western languages, and had no equivalent in Arabic. This indicates that translation procedures followed in importing terms depended on the linguistic origin of the term (cf. Yazıcı & Pekçoşkun 2016: 193-205; Züfekar 1991:3-13). The terms imported from French, or other Western languages were generally “naturalized”

instead of making an effort to replace them with Arabic equivalents in Ottoman scientific language. For example, Ali Süavi (1870-1933), one of the leading figures in education, advocated adopting foreign terms through “naturalization”. Just opposed to Ali Süavi, Ziya Gökalp (1876-1924) claimed to search for Turkish equivalents in colloquial language. The students referred to textbooks also as a source of terminological dictionary. For example, Ottoman scientists or students referred to Şanizade Atallah’s (1771-1826) comprehensive book under the title of *Hamse-i Şanizade* (1820), which served as a textbook and terminological resource to those studying or training in the field of medicine. The book was published in 1820 by *Dar ü-tıbaat ül-amire*, which was the first national publishing house in Ottoman Empire. It was composed of five volumes and each volume dealt with different subfields of medicine such as anatomy, physiology, surgery, herbal medicine and practical information for physicians (Kemahlı 2015:6-8). The Turkish equivalents of medical terms in *Hamse-i Şanizade* laid the foundations of contemporary Turkish medical terminology after 1870s. It was also used as a terminological reference in translation of *Nysten’in Dictionnaire de Medecine* (Lugat-i Tibbiyye) which was translated and edited by *Cemiyet-i Tibbiye-i Osmani* (Ottoman Society of Medicine) in 1873. However, Şemseddin Sami did not include scientific terms in his famous Turkish dictionary titled *Kamus-ı Türki* (1900) in spite of the terminological studies held in specific fields through translation activity. It may have been due to the terminological chaos experienced in transferring new concepts to Turkish scientific jargon that Şemseddin Sami refrained from including scientific terms in *Kamus-ı Türki*.

### Medical Schools and Turkification of terms

Studying the history of Medical education may also illuminate why scientists today are still struggling with terminological problems. Just after the destruction of Janissary Corps in 1826, Mahmud II founded the first military school of medicine (Tıphane-i Amire) following the Chief Physician, Mustafa Behçet Efendi’s proposals (called Arıza). He knew Arabic, Persian, Italian and French, and translated seven books from Italian on Pandemic diseases, such as smallpox vaccination, cholera, syphilis etc (Kazancıgil 1999: 255). He was consigned to the supervision of the medical school as headmaster. French and German Medical education systems were set as a model in the shaping of the curriculum of the program. The medium of education was Arabic and French. In first year, they taught Arabic, French, physics and chemistry; in the second year, French, Anatomy, Zoology and Botany; In the fourth year, General health and Military Surgery; and finally, in the fourth year, internal medicine, and surgery. The second medical school called Imperial College of Medicine (Mekteb-i Tıphane-i Şahane) was founded In 1834. This time the medium of education was French. Dr. Charles Ambroise Bernard was invited from Vienna, and was assigned as headmaster to shape the curriculum of medical education with the chief physicians of Sultan Mahmut the Second (1785 – 1 July 1839), Mustafa Behçet Efendi (1774-1832) and his brother Abdullah Molla respectively. However, Mahmud II’s intention was not to maintain French as the medium of education (Kemahlı 2015:7). His main intention was to import scientific knowledge on sound grounds. For this purpose, even the dissection on the cadavers was permitted alongside the clinical attachments. Dr. Bernard wrote four textbooks in French and two of them were translated into Ottoman Turkish. The first one was the translation of *Phannacopee Militaire Ottoman*, (1844), “Farmakope ve Kodeks, which ended in setting the rules for drug use. His second work was titled *Precis de Percussion et d’Auscultation* (Oskültasyon ve Permütasyonun Kuralları) and published in 1843 (Kazancı 1999: 266). Meanwhile, a medical society was founded under the name of *Cemiyet-i Tibbiye-i Şahane* (Imperial Society of Medicine) in 1857, all the 39 founders of which were foreigners. They issued a journal titled *Gazette Medical Orient* in French. It was issued for 75 years. In 1906 the number of members reached 288, yet only 17 of them was Turkish (Kemahlı 2015: 8). The underlying reason why the number of Turkish members was fewer than the foreign members was to maintain medium of education in French, and by this way secure their academic positions in the Imperial College. For this reason, they insisted that Turkish was not appropriate for scientific

language basing their claims on Arabic as the medium of instruction in Madrasas. However, textbooks and translation activities led orientation towards Turkish language as medium of education in the course of time. Finally, a new medical society called *Cemiyet-i Tibbiye-i Osmaniye* (Ottoman Society of Medicine) was founded by Dr. Kırımlı Aziz Bey and his colleagues supporting Turkish language as medium of education. The society held secret meetings to develop Turkish medical language by the financial help from Hadji Arif Bey. He was then the head of printing house of Imperial College of Medicine, and supported the members of the society, who aimed to Turkify French medical terms. Hadji Arif Bey also helped them to buy French medical dictionaries and books. Besides, he hosted them in his house to hold their meetings. All these efforts and initiatives laid the foundations of *Mekteb-i Tibbiye-i Mülkiye* (Civil College of Medicine in 1867, and prepared the infrastructure of contemporary medical education in Modern Turkish.

### Conclusion

In conclusion there were three trends in transfer of terms from the period of Reformation (1832) to the Alphabet Reform in 1928, which was determined by the translation activity held in colleges, and scientific societies as mentioned above. They can be enlisted as follows:

1. First those supporting Turkish in Arabic Script, what we call Ottoman Turkish,
2. Next those supporting French,
3. Then those supporting Arabic Language as medium of education.

Another issue was from which languages translation activity be held. For example, while some intellectuals, especially those holding office in madrasas advocating translation activity from Arabic, those holding office in Imperial Colleges supported translation activity from French. There were even such intellectuals who advocated translation activity from Greek and Latin languages with the impact of Positivist trends in scientific approaches. For example, Ahmet Mithat (1834-1912) was one of the feverish supporters of translation activity from Latin and Greek since he claimed that their scientific approach in taking “Nature” as an object of study revolutionized the conventional scientific methods of the West based on contemplative sciences, and reversed the direction of research methods on observation and experimentation. On the other hand, some of the intellectuals supported translation activity from French, which ended in direct transfer, or naturalization of terms from the Western languages. Abdullah Cevdet even advocated maintaining medium of education in French. Finally, those supporting Turkish as medium of education advocated translation activity from French. Within this scope, Kırımlı Aziz Bey and his supporters in the field of medicine could be assumed as the pioneers in the adoption of Turkish language both as medium of education and as scientific language (Kazancıgil 1999:322). Accordingly, debates on scientific language and terminology formation in this period ended in importing a lot of loan terms from the East and the West. In other words, Arabic supremacy in scientific language was replaced with French in the course of time. This indicates that the direction of the transfer of the terms and scientific language changed in direct proportion with the level of advances recorded in the field of science and technology.

### REFERENCES

- Elmacı, İ. (2017). Osmanlı Türkiyesinde Bilim Akademisi Kurma Girişimleri ve Deney. *Osmanlı Bilkimi Araştırmaları*. Vol. 18(2), pp. 77 – 92.
- Günergun, F. (1998). Eski Fransız Metre ve Osmanlı Metre ve Ölçü Tartılarının Sistemlerindeki Eşdeğerleri: İlk Karşılaştırmalar ve Çevirime Cetvelleri. *Osmanlı Bilimi Araştırmaları*. 2. pp.23-68.



- 
- İhsanoğlu, E. (1998). Osmanlı İmparatorluğunda Bilim Teknoloji ve Sanayileşmede Modernleşme Gayretleri. *Osmanlı Bilimi Araştırmaları II*, pp. 1-22. İstanbul: İstanbul Üniversitesi Edebiyat Fakültesi.
- Kazancıgil, A. (1999). *Osmanlılarda Bilim ve Teknoloji*. Gazeteciler ve yazarlar Vakfı Yayınları.
- Kayaoğlu, T. (1998). *Türkiyede Tercüme Müesseseleri*. İstanbul, Kitabevi,
- Kemahlı, S. (2015). Tıp Eğitimi Ve Hekimlik Dilimiz Nasıl Türkçeleşti? *Tıp Eğitimi Dünyası*. 44, 5-12.
- Tekeli, İ.&İlkin, S. (1999) *Osmanlı İmparatorluğunda Eğitim ve Bilgi Üretim Sisteminin Oluşumu ve Dönüşümü*. Ankara: Türk Tarih Kurumu.
- Ülken, H. Z. (1997). *Uyanış Devirlerinde Tercümenin Rolü*. İstanbul, Ülken Yayınları.
- Yazıcı, M. & Pekçoşkun, S. (2016). A Tentative Study on The Translation of Neologisms. In Eyup Sarıtas (Ed.). *Cultural and Humanities Research (193-205)*, Indiana: Trafford Publishing.
- Zülfikar, H. (1991), *Terim Sorunları ve Terim Yapma Yolları*. Ankara: Türk Dil Kurumu Yayınları.