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A Bibliometric Study on "Literacy" in Post-Soviet Countries

Post-Sovyet Ülkelerde Okuryazarlık Üzerine Bibliyometrik Bir Çalışma

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Abstract

The present study aims to examine the historical development of literacy debates in 15 post-Soviet countries established after the dissolution of the Soviet Union based on cultural and social developments, and the status and direction of literacy-related studies in the hybrid regimes formed by the unique characteristics and heritage of post-Soviet countries. Moreover, the study also aims to reveal the state of literacy in the Soviet Union and the post-Soviet countries, which are among the benchmark societies of non-Western modernization, as well as the events that took place in this process, and different debates on literacy in these societies within the framework of their state structure, ideological elements, and the underlying reasons. In the study, the articles selected within the sample related to the keywords "literacy" and "digital literacy" published in post-Soviet countries were analyzed using the bibliometric method.

Keywords:
literacy, Soviet, Post-Soviet, digital literacy, bibliometric analysis.

Öz

Bu çalışma, Sovyetler Birliği'nin dağılması sonrası kurulan 15 post-Sovyet ülkesinin kültürel ve toplumsal gelişmelere bağlı olarak okuryazarlık tartışmalarına ilişkin tarihsel süreç içerisinde gelişimini, post-Sovyet ülkelerin kendine has özellikleri, geçmişten getirdikleri mirasla oluşturdukları hibrit rejimlerde okuryazarlıkla ilgili çalışmaların durumu ile yönelimlerini incelemeyi amaçlamaktadır. Bununla birlikle çalışma, Batı-dışı modernleşmenin gösterge toplumlarından olan Sovyetler Birliği ve post-Sovyetlerde okuryazarlık olgusunun durumu ve bu süreçte yaşananları ortaya koymak, aynı zamanda devlet yapısı ve ideolojik unsurlarla birlikte yer alan toplumların farklı okuryazarlık tartışmaları ve bunun nedenleri üzerine odaklanmaktadır. Çalışmada, post-Sovyet ülkelerinde yayınlanan "okuryazarlık" ve "dijital okuryazarlık" anahtar kelimeleriyle ilgili örneklem dâhilinde seçilen makaleler bibliyometrik yöntemle incelenmiştir.

Anahtar Kelimeler:
okuryazarlık, Sovyet, Post-Sovyet, dijital okuryazarlık, bibliyometrik analiz.

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Introduction

Literacy can be defined as the endeavor to reinterpret nature and society and reproduce them through symbols. In order to influence nature and society in particular, it is necessary to define and conceptualize objects. Alphabets and the meanings derived from them are where these phenomena are concretized. Through reading, each object produced fixes reality in time, and reflects and reshapes it through action. Goody (1996) explains literacy through writing and social organization within the historical process. At this point, the relationship between writing and society is shaped through the phenomena of religion (sacredness), bureaucracy (state) and law (order). At the same time, the continuity and transmission of writing are ensured by the reader. The inclusion of a text in the system depends on the reader. On the other hand, literacy and writing are an added structure of oral tradition and culture. This structure is influenced by societal organization, bureaucracy, urbanization, historical accumulation, social expectations, and writing materials (Goody & Watt, 1963, p. 344-345).

Literacy, which is an element that binds the individual to authority (religious, secular) is one of the tools that ensure the continuity of social order and the unity of society (Cressy, 1980). Literacy practiced with technical tools differs in terms of the characteristics of the tool and the reader, the socio-economic and cultural structure of societies, time, space and function (Ayhan, 2017, p. 30). Literacy, which is defined as a set of skills, tasks, practices or critical thinking in terms of its outcomes, varies depending on the status of the society (western, developing, underdeveloped), its importance within the country, its impact on educational practices, its form of evaluation and individual perception (Walter, 1999, p. 44-46). However, literacy is built on a certain language and demographic structures have an impact on language. While geography, population, economic factors, migration and urbanization stand out, education, social ideology, thought and policies draw secondary attention in terms of literacy (Lewis, 1979). Thus, literacy attains significance depending on the meaning that societies and individuals attribute to the phenomenon of reading and the function of reading within social status.

The Russian Tsardom, on which the Soviet system was geographically and historically built, was a multinational empire. Approximately half of the empire's population consisted of ethnic Russians (Çalık, 2025, s. 7). Communities in the tsarist empire differed from each other in terms of economic and cultural development and the phenomenon of nationhood. The history of Russian literacy developed in four stages. The third stage, covers the period from the 18th century to 1917, while the Soviet period after 1917 constitutes the fourth stage (Mironov, 1991, p. 229), and the post-Soviet period represents the fifth stage. The literacy of each period is different from each other. In the first period, churches and monasteries were decisive and a literate stratum was formed through the clergy. The first books printed in the Cyrillic alphabet (1491) (Sokolyszyn, 1959) and the origins of Russian printing were influenced by the phenomenon of religion (church) and Eastern Europe (Ukraine) (Prostov, 1931). The first official printing press was established in Moscow in 1560 by Ivan Fedorov

with limited government support. Although the printing press was weaker in terms of market and social influence compared to Europe at the time, it had a significant impact on the production of the social elite. Printing culture began to develop in the 1660s with the printing of Bibles (Marker, 1982). In the 16th and 17th centuries, the field and content of books developed in accordance with the social strata (Klepikov, 1971). As literacy increased, so did the government's control over the printing press and texts (Franklin, 2010a; Franklin 2010b; Franklin, 2011; Franklin 2015). Although the government expanded censorship, society and the individual developed ways out and improved their relationship with literacy, and oppression led to the formation of extremes in the direction of change (Ayhan & Dosbolova, 2021, p. 481).

During the reign of Peter I, literacy obtained further value with urbanization, universities and schools, and became a part of social life. In the country, which was a model of non-Western modernization, scientists and thinkers gained prominence, while books became status symbols and attractive assets (Brechka, 1982). In the late 18th and early 19th centuries, advances were made in technical areas, transportation and printing (Szrajber, 1992). In 1847, 30% of the urban population and 10% of the peasant population were literate, while in 1897, the overall literacy rate reached 21.1%. Higher education developed more rapidly than primary education (Saunders, 2010, p. 32-33). Literacy differentiated between regions (Europe-East), did not take place in the same process and function, and women moved from literacy to teaching and began to influence texts and opposition to the patriarchal structure (Brooks, 2019, p. 95; Khalid, 1994). With periodic variations, differences in central and peripheral, urban and rural regions, genders and geographical characteristics (Europe-Asia) were effective in literacy. By the late 19th century, printing became an industry in St. Petersburg, the gateway of the country to the West (Steinberg, 1990). In the 1900s, the literacy rate in certain centers in Russia reached 50% and Western classics, particularly by French authors, were widely followed by the public as in other countries (Firsher, 2003, p. 297-281).

After the Soviet Union was established, it evaluated itself politically and economically within an existing non-western structure. Using Russia's tradition, it closed the gap with the West in terms of urbanization and literacy with its ideological paradigm and pushed ahead at certain points, thus creating the category of the "Soviet man" with the aim of designing a new world. Although each Soviet regime can be defined and evaluated within itself, the Soviets stood on the stage of history as one of the best examples of non-Western modernization. Post-Soviet societies, on the other hand, were left with the problems of the pre-Soviet and Soviet periods as well as the current circumstances. Domestic problems as well as problems integrating into the world and building a new nation became more intricate and insurmountable. At this point, literacy, which is an important tool in the relationship between society and the individual, rose to a significant position. This is because the languages and alphabets through which the nation-states would construct their own identities and futures were formed out of necessity against the dominant Russian language, community and phenomenon (Ayhan & Baloğlu, 2018). Developing alternatives to the language and

alphabet, which had penetrated all layers of daily life and institutional correspondence in particular, facilitated the transition with the introduction of digital elements. With literacy and its varieties, society started to be reshaped and it became important for post-Soviet countries to address the phenomenon of literacy and to examine the studies on the subject.

The Soviet Union and Literacy

When they rose to power, the Bolsheviks were directly linked to an organization of approximately two hundred thousand people and a population of 3.5 million out of 150 million (Ascher, 2020, s. 213). At the same time, the urbanization rate of the population was quite low and the Bolsheviks had to quickly penetrate into social areas (Atasoy, 2009, p. 6). Among the urban areas, St. Petersburg and Moscow stood out in the fields of education, culture and art. These two Russian cities became the foundation of the political and cultural structure and functioned as the surrogates of reforms, change and individual literacy in Soviet culture (Afanas'ev, 1994, p. 220).

The first and most significant cultural campaign launched after the October Revolution was the mobilization of literacy. Since then, the emphasis on education has overtaken all subsequent modernization goals (Goban-Klas & Kolst, 1994). In 1919, in response to the country's literacy problem, the Bolsheviks made literacy compulsory for all illiterate persons between the ages of eight and fifty, and within five years, approximately 45% of the rural population was officially registered as literate. This rate continued to increase under the rule of Stalin (Fischer, 2003, p. 298). In the 1920s and 1930s, campaigns to literate adults continued. The goal of eradicating illiteracy was in fact a new cultural behaviour, an adaptation to the Soviet language, the Soviet administrative system and ideology (Glushchenko, 2016). The Bolsheviks took over the institutionalized structures of the Russian Tsardom and utilized them in the field of education. Educational institutions were turned into centers for spreading Soviet ideology. Teachers became the carriers and catalysts of the new system. In the Eastern regions of the country, particularly in Turkestan, free and coeducational education with materialist ideas was provided in mobile and boarding schools (Akimjan Kyzy, 2019, p. 227-228).

This was also a means of propaganda by the state. The state continued its broadcasting activities around ideological political thought, particularly via the press, movies, posters and publications. The system, which prioritized soldiers and individuals with public relations over civilians, created Soviet citizens through these segments. This strong and disciplined strategy proved successful over the years (Kenez, 1985). The Soviet government reinforced the ideology through education by annually specifying educational materials and content (Ong, 2013, p. 55). Propaganda efforts also introduced problems between what was and what should have been.

Soviet culture began to develop new forms of culture, literacy, citizenship, public life practices, and a new state of faith, and utilized these four areas in the nationalization of ethnic groups (Hirsch, 2005, p. 196). Universal literacy through mass mobilization reinforced nationalism while creating a Soviet identity at the same time. However, not all communities transformed into Soviet people, but rather became

aware of their national identity as they encountered the other (Kenez, 2006, p. 233). These forms of nationalism were used in the process of building new types of nationalism and identity following the collapse of the Soviet Union.

The 1920s marked a period in which knowledge was reconstructed through the Marxist paradigm. Scientists dedicated to the Soviet ideology pioneered the country's educational underdevelopment problem and proposed solutions using ideology in science through the Soviet people (Graham, 1993, p. 104). After the Bolsheviks consolidated their power in the state apparatus, they started to implement socialism in line with the level of development within the country. In order to equalize societies, welfare-oriented activities, particularly mass education and health, were prioritized, and unfit rural areas were prepared for industrialization and modernization (Luttwak, 1983, p. 5, 142). Initially, language policy was not homogeneous. There were differences in practice both in Moscow and in the neighbouring countries. As the state centralised, it used language planning as a means of modernisation. (Crisp, 1990, p. 40). In 1926, according to statistics, the literacy rate in rural areas doubled for young males and quintupled for females. Culturally, this also deepened the generational and cultural divide. In the rural areas, young people moved away from the culture of their parents, while in the urban areas they were incorporated into the popular culture of the city under the guidance of educational institutions and mass media (Figes, 2011, p. 163). On the other hand, in Soviet population policy, the settlement of Russian political-ethnic minorities in all Soviet countries was the origin of Soviet language planning. This also ensured the active presence of the Russian language in these societies (Kirkwood, 1990, p. 11-15). In the Turkestan region, the forced change and its effects were more structural. In the process of producing the Soviet human type, education systems outside the Soviet system were eliminated. A system was established in which Russians were placed in the upper levels of education in place of local teachers, and the language of education was developed in Russian. Communities other than the Russian identity could not benefit from this education system to the desired extent (Çelebi, 2019a; 2019b, 2020).

With the cultural revolution in the 1930s, the course of literacy proceeded between the institutionalization of the state and political instrumentalization. Cultural and economic transformation continued with industrialization (Dobrenko, 2011, p. 45; Graham, 1993, p. 93-95). While the state encouraged the development of national languages and cultures, it also promoted the use of Russian as a lingua franca. At a time when Russian nationalism was on the rise, the teaching of Russian became relevant. The study of Russian as a lingua franca for different communities was made compulsory in all secondary schools in 1938. Communities that had already acquired a new alphabet and written language were soon forced to switch to a new alphabet and field of literacy. The compulsory adoption of the Cyrillic alphabet was perceived as an insult by minority communities and the practice served to erase collective memory through text. Moreover, for economic reasons, the cost of producing books and newspapers was diverted to the community. The function of schools was reduced due to the number of students. Problems arose in the press and broadcasting organs

(Kenez, 2006, p. 122,69). As education and language policies function as instruments of power and legitimacy (Karabulut, 2009), problems were not taken into account.

With free health care and free education, the Soviet Union was in a better situation than developing countries. The Soviet Union hosted around twenty Nobel Prizes as a result of its extraordinary development (Popov & Dutkiewicz, 2016, p. 43). During the Cold War period following World War II, the Soviets developed cooperation with third-world regimes that they considered close to them. Treaties were signed with states such as Afghanistan, South Vietnam and Ethiopia, where potential relations could be established in the future, contributing to mass literacy. Although the outcomes did not turn out as desired, this action shows that the Soviets chose literacy as one of the ways to express themselves to the world (Westad, 2016, p. 350, 399). Like the Western Marshall Plan, the Soviets provided China with an aid package of approximately 7% of its GDP during the Khrushchev era. This aid helped China modernize science, technology and industry, and rebuild education and health systems (Vladislav & Zubok, 2007, p. 111).

Literacy was perceived as a practice in which a structure is constructed through a form of enlightenment in which the illiterate strata are joined by the literate, and every aspect of the Tsarist-bourgeoisie is eliminated. In the 1930s-50s, the main goal was to provide Soviet industry with qualified personnel through seven years of complete education and different types of schools. In the 1950s, the Soviet population started to become educated. In the late 1950s, technical education was prioritized in order to prevent schools from isolating students from real life. With the de-Stalinism of the Khrushchev era, popular education and technical education for industry were prioritized and the transition from school to life was taken as the basis. Under Brezhnev, content and technical education were prioritized again with reforms and investments. With the 1979 census, the literacy rate was recorded as 97.8% (Liebowitz, 1986, p. 162-164; Zajda, 1980, p. 2-34). During the Khrushchev period, the strengthening and centralisation of Russian continued. The languages of the local nations were pushed into the background and the Russian corpus developed. During the Brezhnev period, the dominance of Russian was exaggerated, and after this period some steps were taken to glorify Russian and to redress the imbalance with the local languages (Kreindler, 1990, p. 46-47). The dominance of Russian as the official language and the organisation of educational institutions, especially universities, in Russian prevented the development of other languages and the participation of local people in literacy. In a sense, this was by design. Like the intellectuals of Tsarist Russia, the Soviets produced bureaucrats, administrators and intellectuals who came out of the Russian education system.

In the Soviet Union, the first studies on cybernetics and computer literacy, which constitute the origin of digital literacy as well as text literacy, started in the 1960s with mathematics-based studies in Ukraine (Kiev) with the support of the government and academia (Graham 1993). In 1985, the Communist Party launched a mass computer literacy campaign as in the 1920s-30s. This campaign, supported by mass media, particularly the press, discussed the effects of the computer. The Soviet Union started

to utilize computer technology in important activities of military, industrial and business life (Graham, 1987, p. 293).

Perestroika and the modernization of communications ushered in a new era in the Soviet Union. Micro-economics and private education became prominent in education. On the other hand, 95% of the population gained access to television. At the same time, video recorders and media programs started to be produced. This became almost mandatory due to anti-Western sentiment and opposition to Western media programs. Instead of Western consumption patterns, Soviet ideology became the determining factor in the programs (Lane, 2002, p. 318-319). With Gorbachev, democratization movements led to the emergence of different types of nationalism. Naturally, with the influence of historical accumulation, the contribution of each community to this condition was different. The most significant factor in this process was how different nations would experience a dissolution without conflict and what kind of path nationalisms would take. Other factors became secondary (Kotz & Weir, 2007, p. 138-139). Naturally, the paths, the means and the directions were a matter of interpreting society and the future.

Post-Soviet Era and Literacy

With the post-Soviet collapse of organization, ideology and compulsory unity, which had been the elements holding the states and societies together, severe chaos and conflicts emerged, particularly in Russia. These conflicts still persist with single or multiple participants. The uniformity of the compulsory unity of societies through economy and production in the Soviet system led to particularly colossal economic problems. The subordination of each country to Moscow, the lack of clear internal borders, and the geography of the post-Soviets stood out as areas of conflict. As the territory shrunk, conflicts over sovereignty continued to escalate, while on the other hand, the pains of nation-state building, ownership and change enveloped all post-Soviet countries (Sievers, 2003; Zürcher, 2007; Nazpary, 2003). Even though fractures occurred in all areas due to market conditions and hybrid practices, following this turmoil in the post-Soviet period, new types of people and new moral norms against problems were developed and passed on to younger generations (Zigon, 2010).

With the collapse of the Soviet Union in 1991, the first element that became clear was the uncertainty of the future. Young people journeyed with their parents into the uncertainty of what their education and working life would look like. In the new hybrid system focused on the free market, privatization and individualism, education became one of the most important means of adaptation to life, easy monetary gain and vertical social mobility. The vilification of the old system by the public and the media as well as the dissolution of privileged structures led to the perceptual collapse of the post-Soviet education system and caused 83% of the educational population to seek education abroad in prestigious universities (Zajda, 2010, p. xv). Soviet-era literacy took place in the lives of individuals as a product of a system that did not possess commercial features and eliminated regional differences among individuals with a disregard for the relationship between the central and the provincial. The post-Soviet commercialization of education has naturally altered this situation (Rutkevich, 2008).

Furthermore, in a social structure with such a high level of education, how to achieve mass computer literacy in addition to teaching literature, history and geography to all individuals emerged as a question that had to be addressed. Structural problems, intergenerational differences in expectations and segregation manifested themselves in society (Kagarlitsky, 2002, p. 69).

When the post-Soviet education system is monitored through the Russian Federation, it is observed that many problems are encountered. These problems can be defined as Soviet influence even in the post-Soviet period, financing of education, copying of Western ideas, massification and standardization of education, general information systems, inequality and polarization, loss of value orientation among young individuals, the problem of quality in higher education, insufficient inclusion of information systems in education, and imbalance between the education system and the labor market (Taravov et al., 2018, p. 245).

In 1994, out of a population of 126 million, more than 71 million read newspapers daily (Firsher, 2003, p. 315). The development of digital technologies and the "keyboard monopoly" at the root of these technologies made it difficult for non-Latin alphabets and languages to adapt to this system. While the Latin alphabet has determined the future of the PC electronic society, it has also brought about debates on globalization and language (Firsher, 2003, p. 341). Post-Soviet countries were unable to rapidly integrate with the world. In the post-Soviet literacy reform movements, it was observed that unlike the Soviet period, negative outcomes emerged in the Eastern part of Russia outside Europe, where the literacy level of young people was lower than that of the elderly (Dudaitė, 2018).

Method

In the present study, previous studies on digital literacy or literacy in Post-Soviet countries were analyzed using the bibliometric method. The bibliometric method systematically addresses the bibliographies of publications (Sönmez & Hastürk, 2020). The large amount of data published in academic journals, books, patents, papers, etc. is required to be stored and organized in bibliometric databases. Bibliometric data such as citations, keywords, titles, journals, authors, institutions, etc. on these platforms are analyzed through the bibliometric method (Waltman & Van Eck, 2013a; Gutiérrez-Salcedo et al. 2018). Web of Science, which hosts the studies published in the field since 1900, evaluates the studies in its database based on certain standards and scientific impact criteria, regardless of language, region or field of study (Chavarro, 2018; Visser, et al., 2021).

The present study, which is limited to research articles, focuses on studies that involve the concepts of "digital literacy" or "literacy" in post-Soviet countries listed on the Web of Science database. The study data were obtained from the Web of Science database between January 1 and January 15, 2023. Among the 1000 research articles on the topics published in 15 post-Soviet countries (Russia, Ukraine, Estonia, Kazakhstan, Lithuania, Azerbaijan, Armenia, Georgia, Latvia, Tajikistan, Uzbekistan, Moldova, Belarus, Kyrgyzstan and Turkmenistan, In the period analyzed, there were no studies

on digital literacy or literacy only in Turkmenistan) 624 are indexed in ESCI, 252 in SSCI and 124 in SCI-Expanded.

Network visualization was employed to render the study data meaningful and systematic. The data obtained from the Web of Science database were transferred to the VOSviewer software and processed in this program. VOSviewer is a computer software for creating, visualizing and exploring bibliometric maps of academic publications (Waltman, et al., 2010; Van Eck & Waltman, 2011; Van Eck & Waltman, 2014a). Two visualizations play an important role in VOSviewer. The first visualization shows the clusters in a clustering solution and the citation relationships between these clusters. The second visualization uses a term map to indicate the topics covered by a cluster. This visualization displays the most significant terms that appear in publications belonging to a cluster and the co-occurrence relationships between these terms (Rodrigues, et al., 2014; Van Eck & Waltman, 2017).

The data were analyzed using the VOSviewer program with the categories of author, journal, university, citation and co-word. In these analyses, the authors, universities and journals with the highest number of publications were included, and the analysis of the most cited authors, universities and journals was also visualized (Van Eck, et al., 2013b; Van Eck & Waltman, 2014b). VOSviewer displays the clusters that are related to each other in bibliometric analyses in the same colors. Additionally, the size of the circles in the figures represents density (Van Eck & Waltman, 2013a; Oyewola & Dada, 2022; Finandhita, et al., 2022). Apart from this, Figure-1, which shows some data and the fields of study in the database, and Figure-2, which shows the distribution of studies by years, were obtained from Web of Science.

Findings

In the present study analyzing 1000 research articles on "literacy" and "digital literacy" conducted in post-Soviet countries on the Web of Science database using the bibliometric method, no studies on digital literacy and literacy were found in Turkmenistan, therefore, findings were obtained based on the other countries. Based on this;

Figure-1: *Distribution of the articles by field of study*

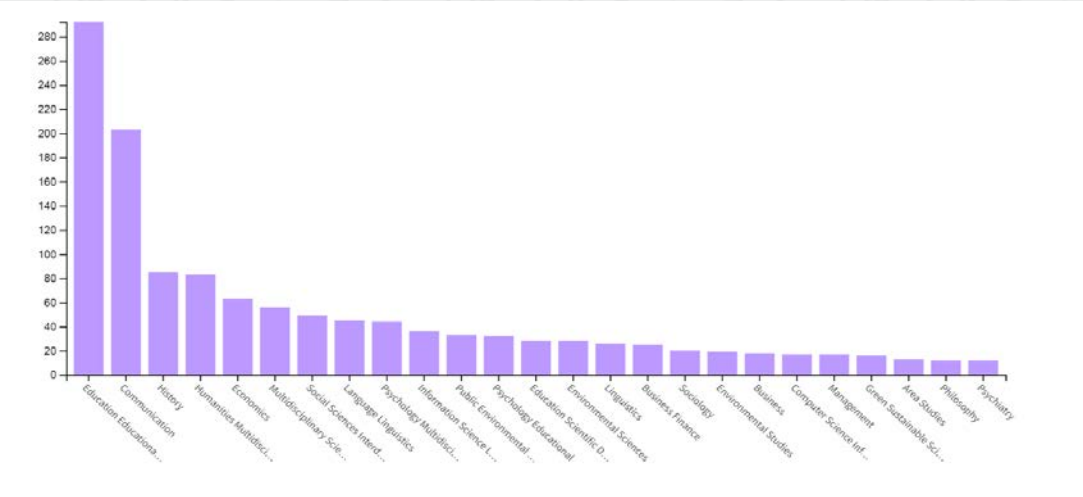

Figure 1 shows the distribution of the research articles on digital literacy and literacy by field of study. The studies on digital literacy and literacy in post-Soviet countries were conducted in 122 different fields of study listed in Web of Science. Among these fields of study, the highest number of studies were conducted in the field of "Education Educational Research". A total of 292 research articles were published in this field. "Communication" ranks second in this regard. A total of 203 studies were conducted in this field.

Figure-2 *Distribution of the articles by year*

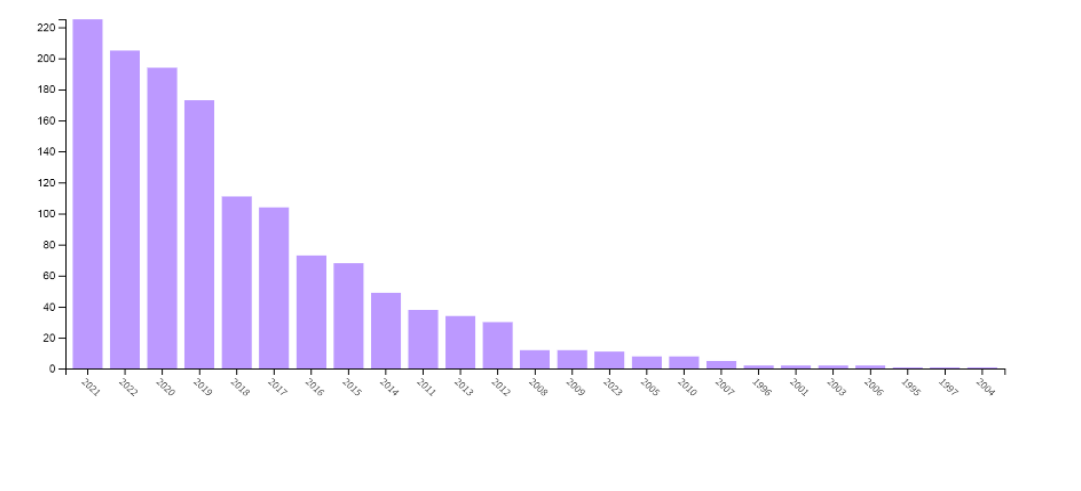

Figure-2 shows the years when studies on digital literacy and literacy began and intensified in post-Soviet countries. It is observed that 15 countries that left the Soviet Union after its dissolution in 1991 initiated studies on digital literacy and literacy in 1995. When the figure is analyzed, it is seen that the studies have intensified particularly since 2019. The highest number of research articles (n=225) on this subject was published in 2021.

Figure- 3 *Distribution of authors with the highest number of studies*

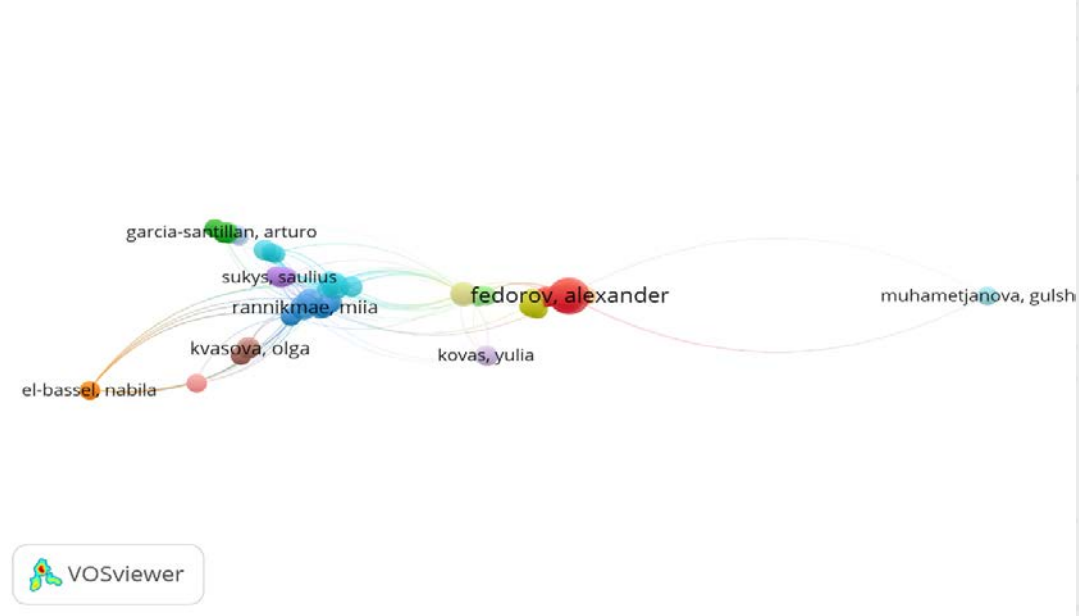

Figure 3 visualizes the authors with the highest number of studies on digital literacy and literacy. When the network is analyzed, it is seen that the common point among the authors is Alexander Fedorov. Fedorov published 36 studies on these topics and these studies were cited 244 times. Fedorov's most cited study is "The framework of Media Education and Media Criticism in the Contemporary World: The opinion of International Experts" published jointly with Anastasia Levitskaya in 2015. In this article, Fedorov & Levitskaya (2015) conducted a study on media literacy and media criticism with media educators in 18 European countries. The fact that the study is quite comprehensive and shows that it is important to synthesize media literacy and media criticism to effectively develop critical thinking skills draws the attention of researchers to this article.

Figure- 4 *Distribution of the institutions with the highest number of studies*

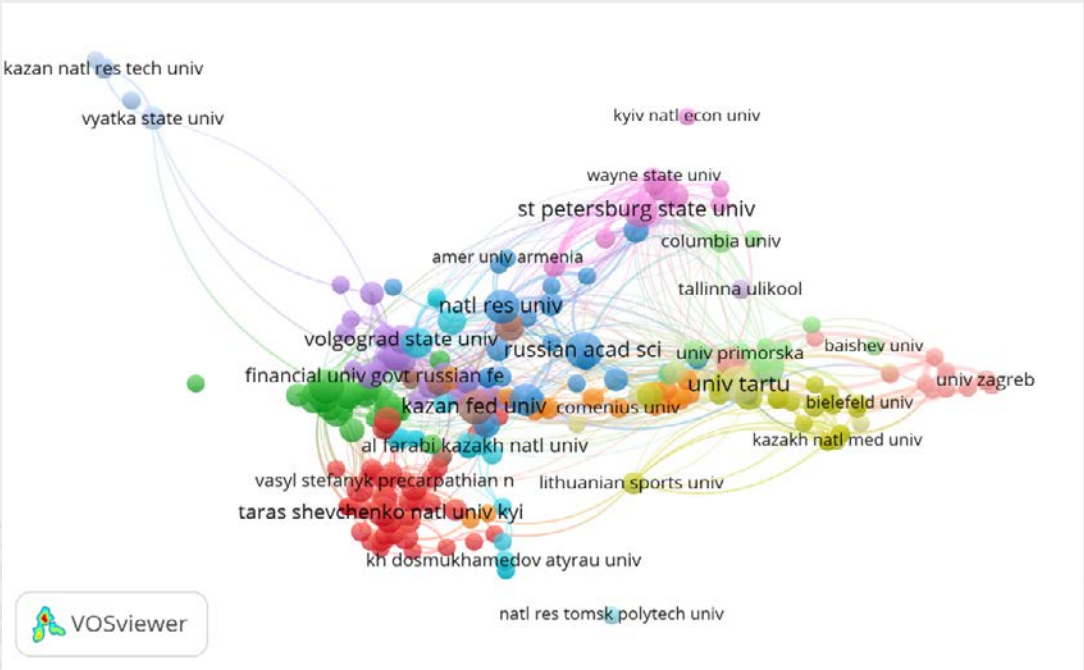

Figure-4 shows the distribution of the researchers by their universities. The 1000 research articles analyzed in the study were published by researchers working at 1100 different universities. There are 257 universities with at least 2 publications in the study. Among these studies, the university with the researchers who published the most research articles is Tartu University in Estonia. Researchers at Tartu University published 43 studies on digital literacy and literacy and these studies were cited 469 times. The most cited university is The Russian Academy of Sciences with 39 publications. These publications were cited a total of 1203 times.

Figure-5 *Distribution of the journals with the highest number of studies*

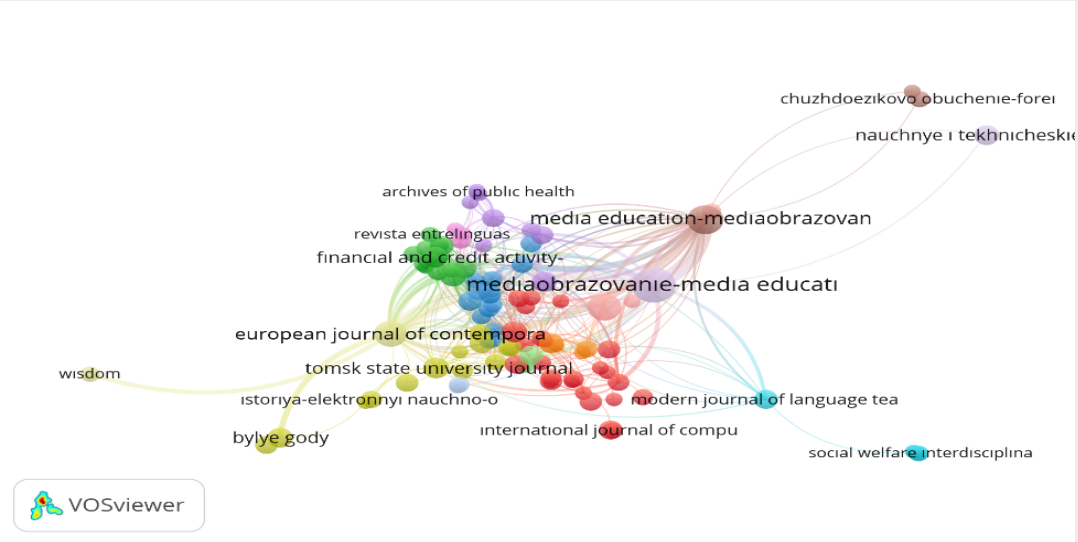

Figure-5 shows the network analysis of the journals that published the highest number of studies on digital literacy and literacy. The journal Media Education (Mediaobrazovanie) published a total of 102 studies on these topics and these were cited 158 times. This journal is indexed in the ESCI index. The most cited journal on this subject is the European Journal of Contemporary Education. The journal, which is indexed in ESCI, is ranked in Q2 in the education category. The 30 research articles published in the journal were cited 270 times.

Figure-6 *Distribution of the countries with the highest number of studies*

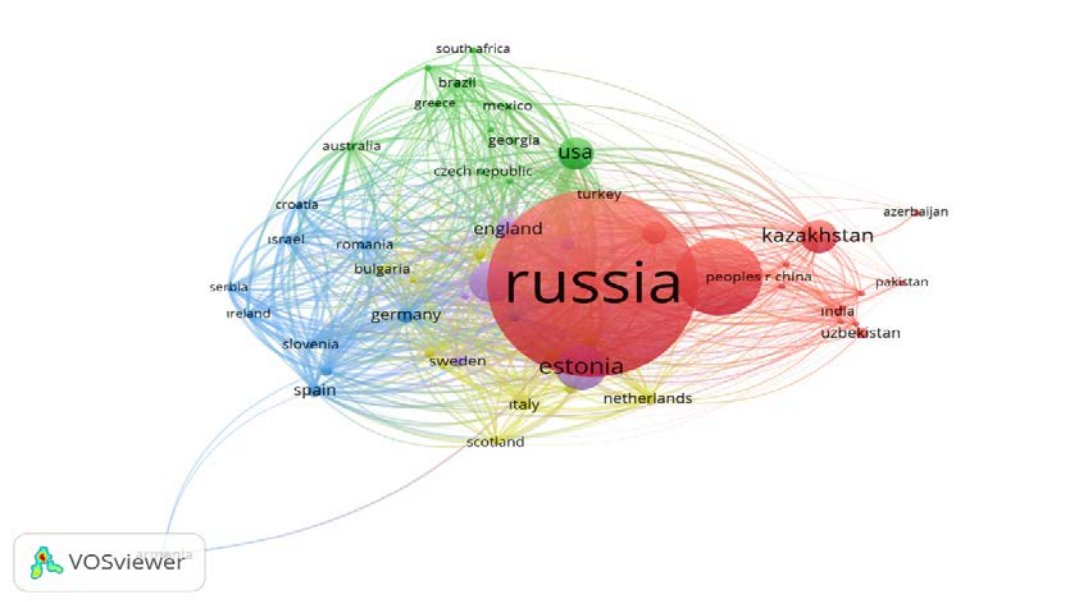

Figure-6 shows the countries with the highest number of studies on digital literacy and literacy. In order to render the graph meaningful, a threshold of 2 publications was set for 78 countries and 56 countries were included in the graph. More than half of the publications in this category (n=596) were made by researchers in Russia. These studies

were cited a total of 2903 times. The countries other than the post-Soviet countries in this figure show the collaborations with researchers based in these countries.

Figure-7 *Distribution of the most cited authors/studies*

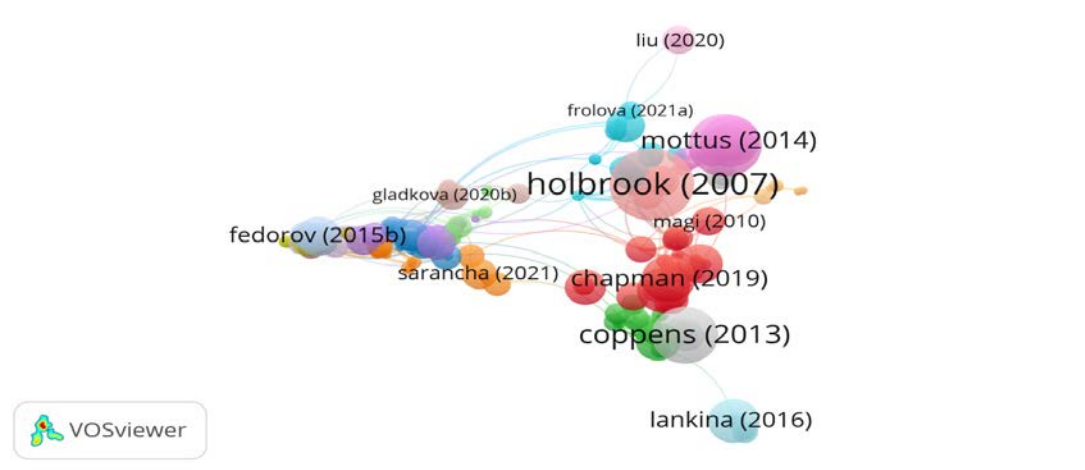

Figure-7 shows the most cited studies on digital literacy and literacy. In the figure, matching colors represent the connection between the studies. Moreover, larger circles indicate the citation power of the studies. In the figure, studies with at least 1 citation were visualized and therefore 510 research articles were included in the network. However, unrelated studies were removed from the list to make the network meaningful. The most cited study in this figure is the study titled "The nature of science education for enhancing scientific literacy" by Jack Holbrook & Miia Rannikmae (2007). The study has been cited a total of 166 times according to the Web of Science citation system. This study is significant as it is one of the first studies to examine the relationship between digital literacy and science education in post-Soviet countries. It is among the reference sources of researchers both because it reveals the existing conditions of the period and because it is one of the studies that emphasize the importance of digital (technological or scientific) literacy in education in post-Soviet countries.

Figure-8 *Distribution of the most used co-words*

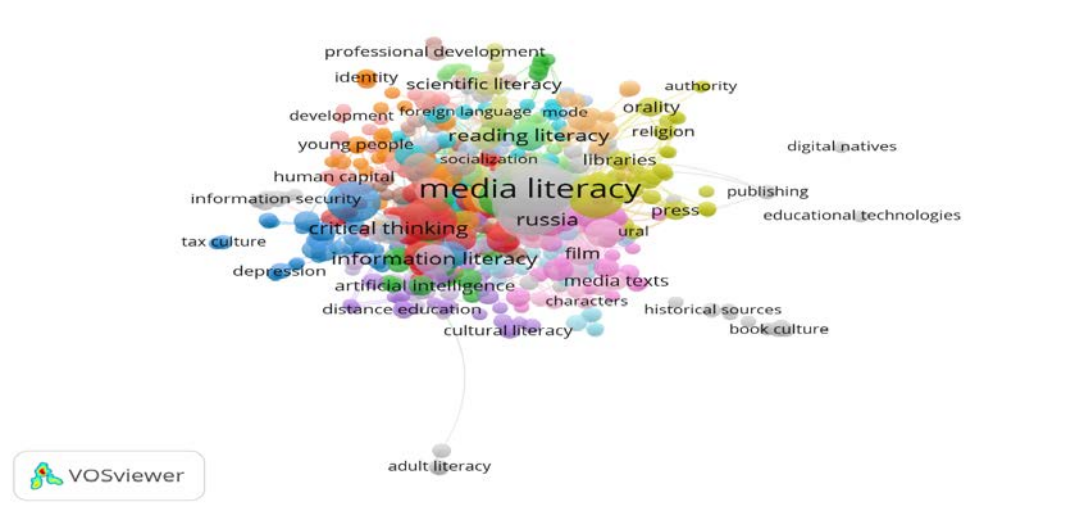

Figure-8 shows the analysis of 3525 co-words in 1000 studies. In the studies shown in the figure, 577 common words emerged after a threshold of at least 2 common words was established. As a result of the study, it was determined that the most common words were "media literacy" (n=163) and "media education" (n=133). This shows that the researchers shaped their studies on digital literacy or literacy through media literacy and media education. On the other hand, some of the least used words in the studies stand out. Particularly in the studies on digital literacy, it is observed that there is a limited number of studies on data literacy, digital generation and mobile technologies and these are among the least used words. On the other hand, it has been determined that researchers studying digital literacy or literacy have conducted a limited number of studies on "social inequality", "social environment" and "media content" and these are also among the least used words.

Conclusion and Discussion

Sanders (1995, p. 6) defines "human beings as a product of literacy". This shows that literacy is among the most fundamental phenomena of humanity. Literacy is a constructive, integrative and critical process involved in social practices. Within itself, it is shaped by reading fluency, language processes and related contexts. Literacy is strategic and disciplinary and also requires motivation and engagement (Frankel, et al., 2016). The rapid technological developments in the early 21st century have led to the adaptation of the concept of literacy to this change. With the digitalization of daily life, the concept of "digital literacy" has gained prominence in a society where the steps of individuals are planned for digital life and the future (Pangrazio, et al., 2020). As with the concept of literacy, there is no clear definition of digital literacy. In this respect, digital network skills developed by Van Deursen & Van Dijk (2009) are also considered within the scope of digital literacy. Accordingly, digital literacy requires having the necessary skills to use internet technologies to communicate and create content. Moreover, using these networks at a level that can meet information needs and possessing the skills to use the internet in line with the determined goals are also among the basic qualities of digital literacy (van Deursen & van Dijk, 2009; van Dijk & van Deursen, 2014).

The present study focuses on the concepts of literacy and digital literacy in 15 "post-Soviet" countries that emerged after the dissolution of the Soviet Union, which once had the largest community of scientists in the world (Wengle, 2015; Tlostanova, 2018), from a bibliometric perspective. After the collapse of the Soviet Union, countries such as Russia, Ukraine, Estonia, Kazakhstan, Lithuania, Azerbaijan, Armenia, Georgia, Latvia, Tajikistan, Uzbekistan, Moldova, Belarus, Kyrgyzstan and Turkmenistan, which focused on creating a new society with insufficient resources following the dissolution, have worked to create new knowledge or build on existing knowledge within the constraints of academic freedom. The new states established after the collapse of the Soviet Union contributed only 3% to the global research landscape (Chankseliani, et al., 2021).

After the dissolution of the Soviet Union in 1991, 14 states began to move away from central Russia and its language (Pavlenko, 20009; Pavlenko, 2013). In order to

revive national consciousness and ensure cultural development, these states turned to new language policies and started to use their own national languages (Laitin, 1996). Development efforts through language have not been reflected in academic studies in countries other than Russia. Within the scope of the present study, 59.6% (n=596) of the 1000 scientific studies in the Web of Science database containing the concepts of "literacy" and "digital literacy" were published by researchers in Russia. The fact that more than half of the studies analyzed together with collaborative studies were published by researchers in Russia and there was no publication on this subject in Turkmenistan shows that post-Soviet countries still retain academic restrictions (Chankseliani, et al., 2021).

Four years after the collapse of the Soviet Union in 1991, academic studies on literacy began to be published. Post-Soviet literacy studies that began in 1995 have gained momentum particularly in the last 5 years with the introduction of the concept of digital literacy to the discussion. It is seen that 15 new states gave importance to collaborative studies despite the dissolution of the union. 1000 research articles examined within the scope of the present study were prepared by researchers from 1100 different universities. Although the researchers in Russia placed greater emphasis on literacy studies, the University of Tartu in Estonia is one of the universities with the highest number of studies in this field with 43 publications. However, the studies of The Russian Academy of Sciences, which published 39 studies, were cited 1203 times, making it the most cited institution.

The journal with the highest number of studies (n=102) on literacy and digital literacy is the Russia-based journal Media Education (Mediaobrazovanie). The total number of citations (n=158) to the studies published in this journal fell behind the 30 research articles published in the US-based European Journal of Contemporary Education. A total of 270 citations were made to the articles published in this journal. This seems to be directly proportional to the decline in the quality of academic journals after the collapse of the Soviet Union and the low indexing of journals (Chankseliani, et al., 2021).

The number of co-words used in these studies was also strikingly high. A total of 3525 common words were used in 1000 studies. However, it was determined that the common topics that the researchers focused on the most were "media literacy" (n=163) and "media education" (n=133). This shows that the researchers focused on media literacy and media education within discussions on literacy. The basis of literacy (Sanders, 1995) and digital literacy (Vartanova, 2002; Hargittai, 2005; Smirnova, 2020) is inequality in access to information. In addition to "digital literacy", it was determined that the researchers were limited in the subjects of "social inequality", "social environment" and "media content" in the studies analyzed.

For post-Soviet countries other than Russia, the use of information technologies and the development of digital literacy skills are very important for the future of these countries. However, the persistence of inequalities in today's society in the digital field, digital divide, and inequalities in access to and use of information and communication technologies can also negatively affect digital literacy (Ayhan, 2017). It is necessary for

future studies on digital literacy and social inequality in post-Soviet countries (Kreitem, et al., 2020) to examine socio-economic and cultural variables as well as demographic characteristics at the root of inequality (Çetinkaya, 2012; Taşkıran, 2017; Nerse, 2020). On the other hand, studies that focus on social and personalized needs, especially at young ages, to evaluate the social environment can help improve the relationship between digital literacy and education (Kateryna, et al., 2020). In today's world, information is unimaginably large and diverse. In addition to the quantity, the accuracy and purpose of information spread across multiple networks are also uncertain. In this respect, the continuation of the Russian cultural structure, especially in post-Soviet countries outside Russia, makes it important to investigate the relationship between media content and digital literacy in these publications (Warschauer, 2009; Koltay, 2011; Polizzi, 2020).

In conclusion, the relationship of the Russian tsarism, which is an example of non-Western modernization, with literacy differed depending on the center-periphery and social strata. In Soviet Russia, however, reading was given unusually high and symbolic importance. This is because literacy was standardized, massified, expanded and presented as part of culture. However, as a result of the top-down culture of repression of the ruling regime, literacy was also seen as a means of status in the stratification of the new states. However, the Perestroika years showed that the theory and practice of Soviet society did not match. Soviet society proved to be diverse rather than homogeneous (Lovell, 2000). The situation demonstrated by Ong (2013) regarding the power and interaction of oral culture even in written form was particularly evident in the Turkic geography. As the system solidified and systematized based on the Russian language, other languages continued to seek spaces for themselves. The efforts of nation-states in the post-Soviet era have been in this direction. In terms of literacy, the Russian language has also been influential in the post-Soviet countries after the Russian Tsardom and the Soviet Union. Another point is that literacy is related to social structures, and when it is utilized as a tool of modernization rather than in response to social demands, it is observed that problems occur in terms of individual consumption and change.

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