The History of Periodicals in Hungarian Secondary Mathematics Education Between 1867 and 1956

Zsuzsanna Kozmane-Fejes

Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
under the Executive Committee of the
Graduate School of Arts and Sciences

COLUMBIA UNIVERSITY

2023

Abstract

The History of Periodicals in Hungarian Secondary Mathematics Education

Between 1867 and 1956

Zsuzsanna Kozmane-Fejes

The purpose of this study was to determine how secondary mathematics education changes in Hungary between 1867 and 1956 were reflected in journal articles of that time. In an attempt to accomplish this purpose, the researcher sought to identify which major political and socioeconomic factors affected the role and content of periodicals, how the content and approach of the topics changed, and who were the most prominent and influential authors of the periodicals between 1867 and 1956. This research investigates *Journal of the National Association of Secondary School Teachers,* the first periodical devoted to Hungarian secondary education published between 1868 and 1944, and *Teaching of Mathematics,* the first Hungarian periodical dedicated to mathematic education published between 1953 and 1956.

The researcher employed historical-research methodology to examine the articles of the periodicals and categorize them based on similar content such as curriculum, teaching methods, school mathematics, and book/textbook reviews. The study also provides brief summaries of several articles.

This research has shown that the history of Hungarian education in general was often influenced by foreign and domestic politics and ideologies. Studying journal articles provides a unique opportunity to observe real-time communication between educators and administrators and to analyze the effect of social and political changes which influenced mathematics education.

Between 1867 and 1956, Hungary underwent major political and social changes—a dual Monarchy with Austria, independence as a truncated state, and occupation by Germany and later

the Soviet Union. These changes significantly altered Hungary as a country and impacted its education system. While every country has undergone political and ideological influences in its educational history, Hungary was particularly affected by neighboring countries such as Germany and later the Soviet Union.

Taking the broader perspective of the evolution of periodicals, this study demonstrated that the history of periodicals as a general form of scientific communication has passed through several stages. The journals, in some respects, are a bridge between educators and were affected by the political atmosphere of the country.

In general, this study has shown that *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* were heavily influenced by social and political changes in Hungary, as well as foreign influences from countries such as Germany and the Soviet Union. These factors collectively formed Hungarian mathematics education between 1867 and 1956.

Table of Contents

List of Tables

List of Figures

Acknowledgments

My sincerest thanks to my sponsor, Professor Alexander Karp, for his guidance throughout the research process and for recommending such an engaging thesis topic. His suggestions and support contributed greatly to the successful completion of this study. I am also very grateful to Professor Smith; many thanks to you for always believing in me since the first class I took with you at Columbia University. Your encouragement has kept me going.

Thank you to Dr. Irina Lyublinskaya, Dr. Phil Smith, Dr. Ioana Literat, and Dr. Julianna Marie Stockton for agreeing to participate in my defense. I appreciate the time you spent reading my paper and offering me your advice, comments, and suggestions.

For the many teachers and professors throughout my academic career who have inspired me to pursue my dreams and mentored me along the way, thank you for your support, encouragement, and wisdom.

This work would not have been possible without the kind support of Mária Borostyániné Rákóczi for helping to collect articles at the National Educational Library and Museum; Csaba Katona for always immediately answering my question regarding Hungarian history and educational policies and guiding me to find a proper resources, and Gabriella Oldham for assistance with proofreading my paper and offering me ideas.

I would like to thank my parents and my siblings, my sisters-in-law, and nieces and nephews in Hungary for supporting me along this long journey.

As always, thanks to my immediate family for their constant cheerleading. My daughters, Kata, Fanni, and Blanka; my son-in-law, Árpi; and my granchildren, Előd, Levente, Enikő, and Luca, thank you for always making me smile even at the hardest moments.

Finally, I thank my husband, Gábor, for his encouragement, unending patience, love, and support. Without your constant inspiration, this piece of work could not be accomplished.

Zs. K-F.

Chapter 1: Introduction

1.1 Need for the Study

The history of mathematics education is a complex field which can be approached and studied in different ways. Research on the history of mathematics education can be traced back to the 19th century (Cajori, 1890; Christensen, 1895; Dahlin, 1897; Fisch, 1843; Jänicke, 1888). In the early 20th century, reports were published on the state of mathematics teaching in Germany (Klein, 1904; Lorey, 1911, 1916) and England (Watson, 1909; Wolff, 1915). The first dissertations on the history of mathematics education in the United States were completed at Columbia University (New York) under the direction of David Eugene Smith (Jackson, 1906; Stamper, 1906). Later studies covered the history of mathematics education in additional countries, with specialized studies focused on a particular country. For example, Jushkevich (1947) and Prudnikov (1956) researched mathematics teaching in Russia. Jones and Coxford (1970) studied primary and secondary education in the United States and Canada. Howson (1982) explored the history of mathematics education in the United Kingdom. Schmidt (1991) analyzed teacher training in Prussia, while Smid (1997) researched mathematics education in Netherlands.

In the early 21st century, additional current studies have examined the history of mathematics education in the United States (Stanic & Kilpatrick, 2003), Italy (Giacardi, 2010), and Russia (Karp & Vogeli, 2011). In addition, a new period of interest in the national histories of mathematics teaching and learning emerged at the 10th International Congress on Mathematics Education (ICME) held in Copenhagen, Denmark, in July 2004. Based on discussions at this Congress, the first issue of the *International Journal for the History of Mathematics Education* was published in 2006.

Important milestones in the field were also presented by Karp and Schubring (2014) in *Handbook on the History of Mathematics Education* to explore developments in mathematics education from ancient to modern times in different world regions. In Chapter 2 of this book, for example, Karp wrote about how to develop a research methodology to utilize in studies of the field of mathematics education. According to Karp, the history of mathematics education has a twofold nature: it is historical in terms of methodologies, while also being mathematical-pedagogical in terms of the object of study. Karp and Furinghetti (2016) wrote that the field can be explored by analyzing curricula, textbooks, teaching aids, administrative decisions related to the development of mathematics education, and biographies of individuals involved in the educational process.

One of the current directions in studying the history of mathematics education is to analyze mathematics education journals. The book edited by Ausejo and Hormigâon (1993) contains a collection of papers about the history of mathematical journals from six different European countries. In addition, Hanna (2003) analyzed three prominent international journals—*Educational Studies in Mathematics*, *Journal for Research in Mathematics Education*, and *For the Learning of Mathematics*—which were published between 1900 and 2000. A number of researchers have explored much earlier publications to expand the historic perspective. For example, Preveraud (2013) explored the content of four American mathematical journals published from 1818 to 1878. Both Costa (2000) and Albree and Brown (2009) introduced the mathematical contribution of the *Ladies' Diary* published in England between 1704 and 1840, while Crilly (2004) and Despeaux (2002, 2007, 2008) analyzed British mathematical journals in the 19th century. Researchers have also investigated journals in their original languages: Furinghetti (2003, 2009) comprehensively studied the French journal *L'Enseignement Mathématique* published between 1899 and 1984, while Schubring (2003) illustrated how the emergence of this journal facilitated international communication and cooperation among countries regarding mathematics education. Morel (2014) analyzed German arithmetical periodicals in the late 18th century, while Dabkowska (2019) investigated three Polish mathematics education periodicals—*Parametr, Matematyka i Szkoła*, and *Matematyka*—which were published between 1930 and 1950.

As this brief overview illustrates, the history of mathematics education of Italy, France, Germany, and Russia has been well explored, but many other countries need investigation. One country which clearly needs more research on its history of mathematics education is Hungary. After comprehensive library and database searches, the researcher recognized a lack of studies that analyze the history of mathematics education journals in Hungary during the 19th or 20th century. As a result, the researcher aimed to identify the sources of this unexplored chapter in the history of mathematics education, specifically in Hungary.

Hungary is a country in Central-Eastern Europe in the Carpathian Basin. Because of its location, the country has always been influenced by its surrounding countries. Hungary went through major political and social changes between 1867 and 1956. First, Hungary shared a dual Monarchy with Austria between 1867 and 1918. Then, after losing World War I, it became an independent, albeit truncated, state. During World War II, Hungary was occupied by Germany and, later, the Soviet Union. After World War II, the Soviet Union took over Hungary in 1949, establishing the Hungarian People's Republic. In 1956, a nationwide revolution against the Hungarian People's Republic and its Soviet-imposed policies broke out. All of these changes for

89 years between 1867 and 1956 significantly impacted Hungary as a country and, specifically, affected its educational system. Researchers have examined the overall educational system in Hungary. For example, Pukánszky and Németh (1999) compared international and Hungarian educational history and trends, while Nagy (1994, 2005, 2006) analyzed Hungarian educational policies between 1868 and 1944.

As a result of the changes in its educational system, Hungary produced several famous mathematicians and scientists at the beginning of the 20th century: Pál Erdős, Lipót Fejér, John von Neumann, George Pólya, and Eugene Wigner. In fact, Vogeli (1997) stated that Hungary had the largest per-capita number of mathematicians and physicists during the first half of the 20th century. Frank (2004, 2012) analyzed the "Golden Era" in Hungarian mathematics as falling between 1867 and 1945. Wieschenberg (1984) examined how this small country with relatively few resources could attain international prominence in the field of mathematics education. Specifically looking at students, Connelly (2010) described the development of the Hungarian mathematics education system of talented students between 1988 and 2008.

While valuable, these studies mainly focused on mathematics education by concentrating on famous personalities and their influences. They also principally based their analyses on primary sources (textbooks, dissertations) rather than on journals and/or periodicals. To add another chapter to the history of mathematics education, this time period on the under-researched country of Hungary, a study of diverse journal articles can provide real-time understanding of the effect of social and political changes on mathematics education in Hungary between 1867 and 1956.

1.2 Purpose of the Study

The purpose of this study was to determine how secondary mathematics education changes in Hungary between 1867 and 1956 were reflected in journal articles of that time. To accomplish this purpose, the study addressed the following research questions:

1. Which major factors affected the role and content of periodicals in Hungarian secondary mathematics education between 1867 and 1956?
2. How did periodicals for secondary mathematics education change between 1867 and 1956?
    a. In content? What topics were covered during this time, and how did the topics change over time?
    b. In approach? How were pedagogy methods emphasized in the articles?
3. Who were the most prominent and influential authors of the periodicals between 1867 and 1956?

1.3 Procedure of the Study

For this study, the researcher employed historical-research methodology. In this primarily qualitative research, the researcher collected all volumes of *Journal of the National Association of Secondary School Teachers* and the first 20 issues of *Teaching of Mathematics* from the National Széchényi Library and National Educational Library and Museum, both located in Budapest, Hungary. *Journal of the National Association of Secondary School Teachers*, which was published between 1868 and 1944, was the first periodical in Hungary dedicated specifically to all aspects of secondary education. *Teaching of Mathematics* was published between 1953 August and 1956 October, then from 1958 to 1990. It was the first specialized journal dedicated to primary and secondary mathematics education.

To answer Research Questions 1-3, the researcher identified all articles that discussed secondary mathematics education in *Journal of the National Association of Secondary School Teachers* between 1868 and 1944 and in *Teaching of Mathematics* between 1953 and 1956. In particular, to answer Research Question 1, the researcher analyzed the political and socioeconomic factors which shaped education in Hungary between 1867 and 1956.

To answer Research Question 2, the researcher collected all articles regarding secondary mathematics education from both journals. First, she classified the collected articles into main categories such as curriculum, teaching methods, school mathematics, book/journal reviews, and others. Then, she subcategorized the content of each article by subject area such as arithmetic, algebra, geometry, general, and other. The researcher was especially interested in reviewing and analyzing the objectives, content, and most important topics covered in these periodicals.

To answer Research Question 3, the researcher identified the most prominent authors included in both periodicals between 1867 and 1956. Finally, she attempted to collect data from their biographies by consulting a system of references and bibliographical dictionaries. If biographies were found, the researcher reported and analyzed data on the authors' years of birth and death, the towns where they worked, their high school and/or university teaching experience, and whether they earned doctoral degrees.

Any analysis of periodicals requires careful tabulation and comparison. In this study, the journal analysis methodology closely aligned with the methodology used by Dabkowska (2019). It also borrowed some approaches applied by Furinghetti (2003), Hanna (2003), Crilly (2004), and Albree and Brown (2009). The researcher arranged the results of this study chronologically, concluding with a summary of findings to answer the research questions.

Chapter 2: Background

2.1 A General Introduction to Hungary

The goal of this chapter is to provide a brief history of Hungary in order to understand the historical and political environment which shaped mathematics education generally and the evolution of Hungarian periodicals specifically.

Hungary is a country in Central Europe, spanning 93,030 square kilometers (35,920 sq. miles) in the Carpathian Basin. The country currently borders Slovakia to the north, Ukraine to the northeast, Romania to the east and southeast, Serbia to the south, Croatia and Slovenia to the southwest, and Austria to the west. Hungary's population is currently about 10 million inhabitants, and its official language is Hungarian, which is a Finno-Ugrian language. The capital is Budapest; other major urban cities include Debrecen, Szeged, Miskolc, Pécs, and Győr.

Because of its location in Central Europe, Hungary has been significantly influenced by its surrounding countries and has a long history of battles to gain its independence, which it finally achieved in 1989.

2.2 History of Hungary Before 1867

During about 1,000 years of history, Hungary either ruled other countries or was occupied by different empires. With the leadership of Árpád, Hungarians, also called Magyars, moved from the East through the Carpathian Basin and occupied the current Middle Eastern part of Europe by 895. In 1000, King István I, also known as Saint Stephen, accepted the Catholic religion as a standard and established the Kingdom of Hungary. By the extinction of the Árpád dynasty in 1301, the late medieval kingdom persisted with Angevin kings, and Hungary became a considerable European power. During the 16th and 17th centuries, the country gradually shrank in area, given increasing pressure under the expansion of the Ottoman Empire. As a result of Ottoman occupation and war, Hungary experienced economic decline, and its population was drastically reduced by the 18th century. Defense against Ottoman expansion shifted Hungary to Habsburg Austria, and the country became part of the Habsburg Monarchy. To boost the country's economy, the Habsburgs organized settlement programs with Catholic Germans to further the Roman Catholic religion in Eastern Europe. In addition, large numbers of peasants from Europe, especially Slovaks, Serbs, and Croatians, settled voluntarily in Hungary. As a result, only 39% of the population was Magyar (Hungarians) and lived mainly in the center of the country (Pálffy, 2021).

By the end of 18th century, enlightened absolutism ended decades of political stagnation in the Habsburg Monarchy, including Hungary. At the beginning of the 19th century, the poverty that was the outcome of the Napoleonic Wars (1803-1815) forced lower-level nobles to enter educational institutions to train for civil service or professional careers. This newly educated generation and some reform-minded nobles launched radical political ideologies from Western Europe and changes in Hungary's political system. This era between 1825 and 1848 is called the Reform Age (in German, *Vormärz*). For example, the official language at that time was Latin (Mikó, 1943). However, István Széchényi, a magnate from one of Hungary's most powerful families, shocked the Diet (the name of the legislative body of "Parlamentum") when he delivered the first Hungarian speech in the upper chamber in 1825. Széchényi proposed the creation of a Hungarian Academy of Arts and Sciences by pledging a year's income to support it. In the early 1840s, Lajos Kossuth, another reform leader, argued for political and economic separation from Austria. He called for broader parliamentary democracy, rapid industrialization, general taxation, economic expansion through exports, and abolition of privileges (equality before the law) and serfdom. In 1844, a law (1844/II article of the law) was enacted making Hungarian the country's exclusive official language for government, education, and religion (Wolters Kluwer, n.d.).

In 1848, radical movements resulted in revolutions for independence in many European countries, including Hungary. During the revolution against the Habsburg Empire, for example, Hungary wanted to achieve the goals proposed by Szécsényi and Kossuth and, thus, formed the first Hungarian government in 1848. The revolution grew into a full-scale war of independence, as the country tried to remove the boundaries of Habsburg domination. After a series of severe Austrian defeats in 1849, the Austrians were on the brink of collapse, and so the new emperor, Franz Joseph I, sought Russian help (Roman, 2003). A joint army of Russian and Austrian forces defeated the Hungarian forces. After the restoration of Habsburg rule, Hungary was subjected to brutal military law by Julius Jacob von Haynau, the leader of the Austrian army, who was appointed plenipotentiary to restore order in Hungary. After the failed revolution of 1849, there was nationwide "Passive Resistance."

2.3 History of Hungary After 1867

In 1867, a Hungarian delegation, led by Ferenc Deák, finally came to an agreement with the Habsburgs by signing the Austro-Hungarian Compromise, resulting in the dual Monarchy of Austria-Hungary (Estók, 1998). The two realms were governed separately by two parliaments from two capital (Vienna and Pest; then after 1873, Vienna and Budapest), with a common monarch and common foreign and military policies. Economically, the empire was a union (Szarka, 2017). The old Hungarian Constitution was restored, and Franz Joseph I was crowned as King of Hungary. The tension between the realms remained a constant political fixture since the Compromise enabled the Hungarian nobility, the gentry to run the country. The gentry significantly lost its power locally and rebuilt its political status based more on office-holding than landownership. The Monarchy created a modern, bourgeois Hungary, with an unprecedented economic and social growth that would last until World War I (Péter, 1992). By 1914, the dual Monarchy of Austria-Hungary was one of the great European powers, with an area of 676,443 km² and a population of 52 million, of which Hungary itself had 325,400 km² and a population of 21 million (Tucker, 2013).

In the aftermath of World War I, during which Hungary allied with Germany and Austria which were defeated, the Austro-Hungarian Monarchy politically and economically collapsed. In 1918, the Monarchy disintegrated, and Hungary became an independent state. Between 1918 and 1920, Hungary was governed by short-lived leftist governments, first under Mihály Károlyi and then Béla Kun. The Treaty of Trianon formally ended World War I between most of the Allies and the Kingdom of Hungary; it was prepared at the Paris Peace Conference and signed in the Grand Trianon château in Versailles on June 4, 1920. As a result, Hungary lost 70% of its land and about two-thirds of its population. Since then, considerable Hungarian minorities have been living in neighboring countries. During the 1920s and 1930s, right-wing former admiral Miklos Horthy, as a regent of Hungary, introduced an authoritarian regime, the Hungarian Kingdom without a King. Laws passed in 1920 (called Numerus Clausus), 1938, and 1939 significantly restricted and later deprived Jews of employment in state administrative and judicial systems as well as participation in education. In November 1940 (more than a year after World War II began with Hitler's invasion of Poland in September 1939), Hungary joined the Tripartite Pact, originally made by Germany, Italy, and Japan. Hungarian Jews were deported, and most died in concentration camps. In 1944, the Allies began to bomb Budapest and other Hungarian cities. In 1945, the Soviet Army captured Budapest and occupied Hungary (Salamon, 1998).

After World War II, the Soviet Union took over Hungary in 1949, establishing the Hungarian People's Republic. A totally communist dictatorship was led by Mátyás Rákosi, the Secretary-General of the Hungarian Workers' Party. Nationalization of industry was completed, and church schools were overtaken by the state. In socialist Hungary, the national economy was defined by so-called "5-year plans," following the Soviet model which specified all required tasks of institutions, companies, and factories. Annual plans were made which broke down economic and production parameters. The plans provided for ways to meet the needs of production and the consumer population and centrally allocate the resources deemed necessary for required tasks. The first 3-year plan, written under the urgent pressure of post-war reconstruction, was adopted between 1947 and 1949, followed by the first 5-year plan between 1950 and 1954.

Between 1949 and 1953, during the Rákosi regime, the government's ideological preferences determined the country's military economy, efforts to increase economic growth, and dreams of remaking Hungary as "a country of iron and steel." After Stalin's death in 1953, Rákosi fell from power and was forced to relinquish leadership to the reform-minded Imre Nagy. Nagy introduced a "new course," which moderated Stalinist policies, reducing government investment in heavy industry while investing more in producing consumer goods (Rainer, 1996). Forced collectivization of farms ended. The people of Hungary were allowed a little more freedom, and the reign of terror ended. Unfortunately, Nagy fell from power and Stalinist policies returned in 1955 (Földesi et al., 1998).

In 1956, a rising tide of unrest and discontent in Hungary broke out into a nationwide revolution against the Hungarian People's Republic and its Soviet-imposed policies. On October 23, 1956, a demonstration was held in Budapest against the Soviet Union and Stalinism. Rebels won the first phase, and Nagy became Prime Minister, agreeing to establish a multiparty system. On November 4, the Soviet troops attacked the capital and other cities and defeated the uprising. János Kádár, who acquired power with Soviet assistance, promised democratic socialism; in the meantime, retaliation and executions began (Földes et al., 1998). Nagy was executed for treason in 1958. Soviet leadership chose Kádár to head the new government and chair the new ruling Magyar Szocialista Munkás Párt (Hungarian Socialist Workers' Party).

During the 1960s, Kádár introduced new planning priorities in the economy. For example, in 1968, the New Economic Mechanism (NEM) introduced free-market elements into the socialist-commanded economy. Hungary was generally considered one of the more liberal countries in Central Europe during communism because of its relatively high standard of living, more liberalized economy, less censored press, and less restricted travel rights. From the 1960s through the late 1980s, Hungary was often referred to as "the happiest barrack" within the Eastern camp. Because of worldwide recession in the 1980s, living standards declined and communism was unable to respond to this development. When Kádár died in 1989, the Soviet Union was in decline, and reformists saw liberalization as the solution to their economic and social issues.

Hungary's transition—a "regime change"—from communism to democracy and capitalism was peaceful and prompted by economic stagnation. The first free elections were held in May 1990. József Antall, the leader of the Hungarian Democratic Forum (a major conservative opposition group), became the first democratically elected Prime Minister since

World War II. Hungary joined the North Atlantic Treaty Organization (NATO) in 1999 and the European Union (EU) in 2004.

2.4 Education in Hungary Before 1867

In the year 1000, Saint Stephen accepted the Catholic religion and established the Kingdom of Hungary. Until the 14th century, official administration, medicine, scientific activities, education, and other intellectual tasks were performed exclusively by the clergy. During the 15th and 16th centuries, humanistic literacy spread throughout the country and reached schools in cathedrals and cities. In 1553, the first Hungarian native alphabet books were published by Gáspár Heltai in Cluj-Napoca (Pukánszky et al., 1999).

During the 150-year Ottoman invasion, a major event of Hungarian school development took place in 1554. Archbishop Oláh moved the ancient school with its library from the occupied Esztergom to Nagyszombat and established the Trinity Saturday Humanist High School in Nagyszombat, which became a “prototype” for a college type of school. About 100 years later, in 1655, the first *Magyar Enciklopédia (Hungarian Encyclopedia)*) was published by János Apáczai-Csere, which helped to enrich and widen the school curriculum.

In 1686, when the Ottoman occupation ended, Buda, the capital of the country, was liberated. This major historical event also marked a turning point in the history of Hungarian pedagogy and education. The most typical school type remained the college, with differences in organizational structure among the different denominations. For example, Protestant schools provided the same place for beginner classes, Latin studies, and academia, while the Jesuits and Catholics in general separated their sixth-grade grammar schools from the upper-level academia. Protestant and Lutheran schools operated under more difficult conditions. The largest Reformed school was established in Debrecen by György Maróthi. After studying in Switzerland and the

Netherlands, Maróthi returned to his hometown and introduced major reforms. In 1743, he published the first edition of a book entitled *Arithmetica or the Craft of Accounting*, written in Hungarian. The book had several editions (Pukánszky, 1999).

At the end of the 18th century, a comprehensive education system of Hungary and partner countries was urged. In 1777, Maria Theresa, sovereign of the Habsburgs, approved a new educational system—a milestone in the history of Hungarian education—called Ratio Educationis. For the first time, Ratio attempted to establish a unified system of education under the control of the state and the monarch. In 1806, the second Ratio Educationis, issued by Francis II, allowed native language schools to operate. It also considered free education for the lower grades and special attention to girls' education. The second Ratio required further development of the city school, creating the forerunner of "civic schools" in which students were taught theology, mathematics, geography, science, and history. This was a key development in that the second Ratio eliminated the previously compulsory German language education. Although the language of instruction in secondary schools still officially remained Latin, this provision allowed the Hungarian language to play a more significant role.

In 1844, Hungarian was made the country's exclusive official language by law. In 1845, the "Rules of Elementary Schools in Hungary" educational policy divided the elementary school into two sections. The subject matter of the lower two elementary grades was the same for everyone. Education occurred in the native language of the areas where different nationalities lived, and Hungarian was taught as an actual subject. The policy made it compulsory for all children to complete the two lower elementary classes between the ages of 6 and 12; failure to do so led to parental punishment. The secondary schools provided the necessary knowledge for careers and prepared students for further studies at the university and academy. At universities, certain subjects were taught in Hungarian, while philosophical, physical, and mathematical lectures continued in Latin until 1849.

By March 1848, radical movements throughout Europe, and in Hungary specifically, transformed the Hungarian civic society and Hungarian education system. A number of people, under the influence of French and Prussian movements, wanted to separate education from the church and install state-independent public education. The leader of these proposed educational changes was József Eötvös; he held the chair of public worship and instruction in the first Hungarian ministry in 1848. The revolution against the Habsburgs changed the political stage, decreasing a priority on education. However, Eötvös's grandiose plans could not be realized for a while. It was only during his second ministry, after the Compromise, that he had the opportunity to realize many of his ideas.

After the failed Revolution in 1849, the court in Vienna followed the policy of centralizing absolutism. The main goal of the Austrian government was to restore the fragmented unity of the Habsburg empire, and Hungary could only be part of this goal. As a result of centralization, the Minister of Culture in Habsburg empire was the chief director of Hungarian public education. During the 1850s, the Austrian government made greater efforts to Germanize primary education in Hungary, making the teaching of the German language compulsory. National textbooks were banned from schools and replaced with Austrian textbooks that had been translated into Hungarian. According to the policy of 1855 from the Ministry of Culture, there were two types of elementary schools: (a) 2- or 3-year lower elementary schools, and (b) 4-year upper elementary schools. In the 1850s, Austria's "Organizationsentwurf" (Entwurf) was implemented in Hungary. In Austria, secondary education was regulated by Entwurf, issued in 1849, which was developed by two university professors: Franz Exner, a philosophy professor at the University of Prague and a proponent of herbartianism, and Herrmann Bonitz, a professor of Greek-Latin linguistics at the University of Vienna. Herbartianism, a pedagogical system based on the work of German educator Johann Friedrich Herbart, applied formal steps in teaching. Entwurf was an important milestone in Hungarian secondary education. According to it, from 1851 on, all secondary schools (gymnasia and real schools) followed the same organizational structure and the same curriculum. However, there were few teachers in the country with the knowledge and experience to teach the new curriculum. Furthermore, when Entwurf was suddenly extended to Hungary, there were no Hungarian textbooks.

After 1860, control of Hungarian public education was transferred from Austria to Hungary, and a new national educational system was established. The decree in 1862 ordered an equality of languages in education. As a result, differences in the language of instruction and curriculum occurred in educational institutions. Because some of the subjects were taught in Hungarian in only several schools, “a real mess in the language of instruction occupied a place in the country” (Fináczy, 1896, p. 84).

2.5 Education in Hungary After 1867

In 1867, the Austro-Hungarian Compromise created an opportunity for the civic development of Hungarian society and, in parallel, provided favorable conditions for the renewal and content-organizational modernization of the Hungarian school system. József Eötvös, the Education Minister, aimed to radically reshape the entire Hungarian public education system in a multi-stage process; for him, the issue of public education was an absolute priority. In 1868, a new education act came into effect: the Eötvös Public Education Act, Vol. 38, mandated general compulsory school attendance from the age of 6 to 12—attending elementary schools for 6 years.

After completing the first four grades of the elementary school, students could enroll in a secondary school such as a civil school for an additional 4 years or in a gymnasium and real school for 8 years. In addition to increasing the number of schools in the field of practical, agricultural, and industrial knowledge, the law also regulated compulsory teaching and the right to establish public schools. According to the Public Education Act, the language of instruction was the native language of the students; this legislation remained in effect until the 1920s. The law tried to establish full freedom and equality in elementary education as an effort to unify the nation. Eötvös knew that the implementation of these provisions of the law would require a huge financial investment, and the effects of the law could not be measured immediately. Following the passage of the Public Education Act, Hungarian primary schooling was significantly modernized, but the result of its development required a long process. The fruit of Eötvös's work only became evident long after his death in 1871.

Eötvös also made attempts to reorganize Hungarian secondary schools as early as 1848. However, this idea remained a plan since new laws were established after his death. In 1879, a law was passed to teach the Hungarian language as a subject in elementary schools. Regarding secondary school education, important steps were the preparation, discussion, and approval of the curriculum for secondary school during the ministry of liberal Ágoston Trefort (August Trefort), who succeeded Eötvös in 1879. The new curriculum represented the pedagogical principles of Mór Kármás's (Maurice Kármán), who was a prominent Hungarian pedagogue, outstanding educational scientist, university professor, and public education policy specialist. The pedagogy contained three basic elements: (a) culture as a fundamental human experience, (b) continuity and interrelationship as pedagogical principles, and (c) instruction with an emphasis on encouraging self-activity (Bődy, 2017).

While the curriculum of 1879 shaped the instructional system, the law on secondary schools of 1883 established the structure, legal status, role of the state, and teacher certification for secondary schools. The 1883 Secondary School Act, presented by Trefort, ordered two types of Hungarian secondary schools: gymnasia and real schools. In gymnasia, Latin, Hungarian, and Greek were the main subjects. Gymnasium graduates earned the highest social esteem, which paved their way into any higher education institution. In real schools, the focus was on the natural sciences and living languages; they met the needs of the economy and civilized society to deepen knowledge of science and technology. The 1883 Act also introduced new requirements for teacher qualification; teachers now had to take an examination before a state teacher examination committee. This measure played a significant role in increasing the number of secondary school teachers. As the result of the 1883 Act, the subject of mathematics became an important component of the Hungarian secondary education curriculum for both gymnasia and real schools and was essential for attending higher education (Kardos, 1931).

Directly after the enactment of the 1883 Act, discussions developed about content material in secondary schools. Representatives of the reform movement who aimed to renew secondary schools urged a revitalization of high school education and a reconsideration of real social needs. The needs of a bourgeois society were less successfully met by an ideal of education that overemphasized classical languages and left little room for the natural sciences. In 1890, an amendment of the 1883 Act no longer obliged high school students to learn Greek language and literature. Instead, students could choose so-called Greek substitutes such as freehand drawing, which was thought to be important for learning natural sciences.

During the era of economic and social growth after the Compromise, Hungarian higher education also developed. In 1872, the Hungarian Parliament established two universities: the

Royal Hungarian Franz Joseph University in Cluj-Napoca and the Royal Joseph Technical University in Buda. Later, in 1912, the Parliament founded two additional universities, one in Bratislava and one in Debrecen.

In the early 1920s, after the Treaty of Trianon and the disintegration of the Austro-Hungarian Monarchy, the country's neo-nationalism ideology produced an energetic education policy established by the Education Minister, Kunó Klebelsberg. The minister considered it important to make the curriculum more practical and to teach living foreign languages. A 1924 Act introduced a new type of secondary school combining the gymnasium and the real school, now called the "real gymnasium." As a result, a large majority of secondary schools became real gymnasia, represented by 71 institutions, while the remaining schools were either gymnasia (26) or real schools (21) (Kornis, 1932). Following the nationalist legitimacy of the new regime, the importance of so-called national subjects was the same (Hungarian language, literature, and history) in all three school types. In the real gymnasium, Latin, German, and an additional modern language (English, French, or Italian) were also taught. Gymnasia focused on Latin, German, and Greek instead of modern languages. Real schools mainly focused on teaching mathematics and science. The idea of the 1924 Act was to create secondary schools that provided equal access to higher education institutes (Nagy, 2006). In addition, as the provisions of the Secondary School Act of 1883 relating to teacher training became inadequate, the new law regulated the training and qualification of secondary school teachers. In terms of physical setting, the Act of 1926 facilitated the foundation and maintenance of schools by building 2,000 new classrooms. During these years, a high proportion (over 10%) of the Hungarian state budget was allocated to education and culture. Academic activities and scientific research were encouraged, and young talented students were supported by a foreign scholarship program. The Act of 1926 also announced education for girls in secondary schools, which trained them to be good citizens, receive a liberal education, and pursue independent study at any higher educational institution or university.

In the 1930s, Bálint Hóman, the minister and leading ideologue of the era, strengthened school supervision by the government. The 1934 Secondary School Act abolished real gymnasia and real schools and introduced the unified high school. Until the goal of the 1924 Act was to differentiate secondary schools, this new unified secondary school was based on the education of national studies. The curriculum in 1938 devoted more space to so-called national subjects such as Hungarian language, Hungarian literature and art, Hungarian history, and geography and ethnography of Hungary. At the same time, it reduced the number of hours devoted to Greek, Latin, and the sciences.

Educational policies between 1920 and 1945 were thus characterized by tight central control, decreased freedom for teachers, loss of the local society's control over schools, and decreased competition among schools. These factors helped the government guarantee the traditional structure of Hungarian society (Nagy, 2005).

After World War II, the Hungarian education system was reformed following the Soviet Union model to emphasize equity and secularism. The primary objective of teaching was to deliver an identical basic knowledge to every student. In 1945, 8 years of compulsory general elementary schools were introduced. Moreover, secondary and higher education underwent a radical reorganization process. Diverse secondary-level institutions were reorganized into general gymnasia with humanities and science departments. Where possible, separate boys' and girls' high schools were operated, until coeducation came into effect later on. By 1948, schools were nationalized, and church involvement in public education was abolished by educational law (Nagy, 2006).

Starting in the fall of 1949, Russian was taught as a compulsory foreign language in both upper elementary and secondary schools and higher education. In addition to the general gymnasia, vocational, pedagogical, economic, industrial, and agricultural high schools were established. Secondary and university education became available for the previously oppressed classes.

By the 1950s, public education was subordinated by the Hungarian Workers' Party. Rákosi attempted to replace the educated class of the past by a new "working intelligentsia." The previous reform pedagogy and middle-class educators were replaced by a new generation of teachers. Rákosi's idea included providing better education and more opportunities for working-class children, increasing literacy in general, and disseminating communist ideology in secondary and higher education. As part of his efforts, practically all religious schools were taken into state ownership, and religious education was gradually eliminated. The new educational ideology was aligned with the guidelines of Stalin's socialist pedagogy and the rhetoric of the Soviet Communist Party. Soviet pedagogy including the works of Kalinin, Krupskaya, and Makarenko was translated into Hungarian and adopted into the curriculum.

In 1950, the Public Education Resolution of the Hungarian Workers' Party urged textbooks and curriculum to convey Marxism-Leninism ideology. The new socialist curriculum abolished elective subjects, expanding the curriculum in each class and causing significant student overload. The aim of primary and secondary education was to deepen and further develop acquired knowledge so that students would be suitable for either work or higher education—and, of course, to deepen the Marxist-Leninist worldview. The resolution strongly advocated a closer relationship between school and industry. The demand for specialty teachers also increased.

In September 1950, a new curriculum was adopted into the gymnasia which dedicated a higher number of hours for the sciences. Unfortunately, later, it was discovered that the general gymnasia did not meet expectations. After 1954, only 25% of high school graduates were admitted to universities, while the remaining had to do physical work. The plan was to prepare this larger group with so-called “polytechnic training.” In addition to intellectual, moral, aesthetic, and physical education, “polytechnic education” was introduced.

It is important to recall that post-World War II, there had been a series of reforms also in higher education. The first newly established university was the Agricultural University. The first reform in 1948 had declared that 60% of the students admitted to universities needed to come from working-class families. By May 1952, the Council of Ministers decided that selection of candidates for college and university studies should be based on written and oral entrance examinations at the end of secondary schools.

By the mid-1950s, university students were increasingly voicing critical thoughts about the anomalies of the system. During the 1956 Revolution, the Ministry of Education planned to restructure the school system. In 1958, new cultural policy guidelines reoriented the “struggle for the victory of socialism” to culture and science. The Kádár government reviewed the system, and a new public education law was adopted in 1962 (Albert, 2011).

As early as 1945, the school system had been restructured by new educational policies following the Soviet model. Several curricula were in fact issued for the elementary schools in 1946, 1950, 1956, 1962, and 1978, and for the secondary schools (gymnasia and vocational) in 1950, 1962, 1965, 1976, and 1978. Each new curriculum was followed by the release and adoption of new mathematics textbooks. Educational research programs and experiments were controlled by the Ministry (Szalontai, 1995). The 1970s brought a new wave of educational reform to Hungary, led by Tamas Varga and the Komplex (Integrated) Mathematics Project. The failure of the 1978 reforms may have been the later support for the Education Act of 1985. This act began a radical deregulation of the education system, even before the regime change in 1990 (Halász, 1998).

During the 1990s, the Hungarian educational system—like those of other countries in the East-Central European Region—went through historic changes. The scope and direction of these changes were affected by radical social, economic, and political transformations which took place in the decade following 1989, at which time the institutions of parliamentary democracy and market economy were being built and the country joined the ranks of established European democracy (Halász, 2001).

Chapter 3: Literature Review

This literature review focuses on three relevant areas: history of mathematics education in general and in Hungary, general research on periodicals, and general studies of Hungarian educational periodicals. The selected sources contribute to the current dissertation because of either their content or their methodologies. Among the sources reviewed were books, handbooks, and articles.

3.1 History of Mathematics Education

The following two subsections provide a framework for understanding the methodologies used to study the history of mathematics education. The first subsection starts with a general study of the history of mathematics education in *Handbook on the History of Mathematics Education* (edited by Karp & Schubring, 2014), followed by *History of Mathematics Teaching and Learning: Achievements, Problems, Prospects* (Karp & Furinghetti, 2016). The second subsection continues with general studies of mathematics education specifically in Hungary. The history of Hungarian mathematics education before 1867 is beyond the scope of this study; thus, only works from 1867 onward are discussed. Initially, the researcher begins with reviewing two key articles (Frank, 2012; Gosztonyi, 2016) that analyzed the formation of high-quality Hungarian mathematics education between the late-19th century and 1945. Then, the researcher reviews two important doctoral dissertations—Wieschenberg (1984) and Connelly (2010)—from Teachers College, Columbia University, both of which examined the Hungarian mathematics education system as focused on talented students. The review ends with a summary of Fried's (2010) analysis of the state of Hungarian mathematics education after World War II.

3.1.1 General Studies of the History of Mathematics Education

The aim of this subsection is to introduce general studies that provide a framework for understanding the methodologies appropriate for studying the history of mathematics education. Karp and Schubring's (2014) *Handbook on the History of Mathematics Education* provides an overview of the history of teaching and learning mathematics, focused mainly on secondary education. Since mathematics education is a complex field, the authors attempted to investigate it from various angles. The *Handbook* is divided into six parts. Part I describes the history of mathematics education as a scientific field. Parts II, III, and IV present chronological and geographical lines, highlighting analyses of mathematics education during different time periods (from Antiquity to Modern Period) in various regions (Europe, East Asia, America, and Africa). Part V focuses on the study of history of specific mathematical subjects (arithmetic, algebra, geometry, calculus, and vocational mathematics) and teaching practices. The conclusion in Part VI examines processes that are common to different countries—the emergence of international cooperation, the introduction of technology, and the spread of teacher preparation—all of which impacted the development and nature of mathematics education globally. In addition to documenting and collecting the existing research in the field on the history of mathematics education, the authors also aimed to draw attention to its future development.

Part I sets the foundation for this exploration. Schubring and Karp focused on the history of mathematics education as a discipline of science by examining its scholarly writing and methodology. In his chapter, Schubring described historiography by analyzing the evolution of the history of mathematics education, starting from the mid-19th century to the early-21st century and across countries (Germany, United States, Denmark, Norway, Finland, England, Russia, Canada, Netherlands, and Italy) to survey their history of mathematics teaching and learning in elementary and secondary schools. In the next chapter, Karp focused on developing research methodology for the field of history of mathematics education. His observations suggested that because mathematics education has developed in response to various social needs, the history of mathematics education is a part of social history. Therefore, researchers in the field need to identify and map economic, political, philosophical, and religious connections of a certain time period to understand how they affected the evolution of mathematics education. Karp noted that historians of mathematics education utilize primary sources for their research and addressed their challenges in choosing sources. He proposed taking a broad approach to the history of mathematics education, which is important for locating a variety of sources that provide different angles to create a complex picture.

In Part IV, Karp and Schubring presented how the system of socioeconomic relations transformed the system of education—including mathematics education—in the Modern Period (after 1800) in specific countries or regions (Italy, France, Germany, United Kingdom, Spain, Portugal, Russia, United States, Canada, Latin America, Modern Asia, Africa, and Tunisia). The term “Modern Period” is heterogeneous. When science and technology rapidly developed in the 19th and 20th centuries, the need for mathematics grew, as did opportunities for teaching it. Schubring specifically focused on Germany’s evolution of mathematics education from the Napoleonic Period to 1990, while Karp analyzed Russia’s evolution of mathematics education, starting from the early 18th century (the reign of Peter I) up through 1990. By explaining major historical events, educational reforms, and the role of mathematics educators, all of the chapters in Part IV illustrated the evolution of mathematics education through a range of global impacts and interconnections. *Handbook on the History of Mathematics Education* provides different viewpoints and reflects different approaches to historical research in mathematics education.

In *History of Mathematics Teaching and Learning: Achievements, Problems, Prospects*, Karp and Furinghetti (2016) described a relatively recent focus of study in the history of mathematics education and, more significantly, evaluated which subjects require further investigation, specifically emphasizing “pre-college” mathematics education. Using an expansive approach, they examined mathematics education from the perspective of educators, administrators, and curriculum planners. The authors inspected methods used to study mathematics education and the choices that need to be made in the selection process. Their view was that the methodology of research should analyze a wide range of primary sources, including mathematics textbooks, administrative memos on curriculum, and emails from high schoolers about mathematics. The authors’ methodology was historical, while the language of the text was mathematical. According to Karp and Furinghetti, a deeper analysis of the factors influencing the past and present is necessary; thus, understanding the evolution of mathematics education requires a discussion of society, economics, politics, technology, and religion. Karp and Furinghetti concluded their work with recommendations for further research, in particular the under-researched areas of periodicals, seminars, and conferences.

3.1.2 General Studies of the History of Hungarian Mathematics Education

In the area of the development of mathematics education specifically in Hungary, Frank’s (2012) work provides a good overview. Covering the timespan 1868-1945, Frank first summarized the events of a half-century of the Austro-Hungarian Monarchy between 1867 and 1918. He described it as a time of economic prosperity, technological advancements, and sophisticated financial systems. Frank analyzed how the integration of Hungary into the Austro-Hungarian Monarchy strengthened the effects of European-based science provided in the German language on the Hungarian school system at all levels. He noted that in following the

German model, gymnasia emphasized the importance of all subjects, including Hungarian language and literature, universal culture, mathematics, and the natural sciences. Frank also described the role of some important educators such as physicists Baron Loránd Eötvös and Sándor Mikola and mathematicians László Rátz and George Pólya. Specifically, the foundation of the Eötvös Collegium, Budapest's version of the *École Normale Supérieure* in Paris founded by Loránd Eötvös in 1895, worked to improve the training of high school teachers. Additionally, the inauguration of *Középiskolai Matematikai Lapok (The Mathematics Journal for Secondary Schools*) in 1894 supported student preparation for future national and international mathematics competitions.

Next, Frank discussed the school system from the turn of the century until 1945. He outlined that the Hungarian version of the German gymnasium continued to disseminate scientific thought throughout Hungarian education. The top schools in Hungary which Frank examined—namely Lutheran High School and Model High School—delivered outstanding success in mathematics education. Over several years, both schools nurtured brilliant young men such as John von Neumann (Hungarian American mathematician, physicist, computer scientist, engineer, and polymath); Eugene Wigner (prospective Nobel laureate); Edward Teller ("the father of the hydrogen bomb"); and Theodore von Kármán (Hungarian American mathematician, aerospace engineer, and physicist). Frank stated that because of their Jewish religion, these men left Hungary in 1920s and became famous in the United States. Lastly, Frank summarized the economic and social factors that contributed to the emergence of the high level in mathematics and science education.

Similar to Frank's review, Gosztonyi (2016) also researched the formation of high-quality Hungarian mathematics during the late 19th and early 20th centuries. First, she analyzed educational reforms of the period through a socioeconomic and cultural lens. Gosztonyi noted that mathematics education in secondary schools markedly improved through the contributions and efforts of significant Hungarian mathematicians of the period, such as Manó Beke and Gyula Kőnig. Both Beke and Kőnig played decisive roles by participating in the reform of syllabi and writing textbooks. Beke also joined the international movement for improving mathematics education, directed by Felix Klein, at the turn of the 20th century. Also considered in this article is the role of Lipót (Leopold) Fejér, a significant scholar in mathematical analysis. In the first half of the 20th century, Fejér lectured practically every student who learned mathematics at the University of Budapest. In his role, Fejér supervised such mathematicians as George Pólya, László Kalmár, Pál Turán, and Pál Erdős. In addition, Fejér played a major role in the development of Hungarian mathematical culture and teaching traditions.

Gosztonyi also identified a specific group of first-rate Hungarian mathematicians (László Kalmár, Rózsa Péter, Alfréd Rényi) and mathematics educators (János Surányi, Tamás Varga) of the mid-20th century. Between the two world wars and until 1940, all of them participated in intellectual discussions regarding education led by Sándor Karácsony, a Calvinist pastor and an influential character in education. Finally, Gosztonyi analyzed their writings (lectures on education, mathematics textbooks, letters, etc.) and discussed the main characteristics of the nature of mathematics and its teaching as represented by this group.

In their dissertations, Wieschenberg (1984) and Connelly (2010) discussed the history of Hungarian mathematics education, with special emphasis on talented students. For example, Wieschenberg (1984) focused on the effects of educational policy changes, the Eötvös Competition in secondary schools, the background and preparation of teachers, and the development of secondary school curricula between the 1890s and 1984. Her sources were scientific publications, educational journals, and official Hungarian publications. Like Frank, Wieschenberg also analyzed the effects of *The Mathematics Journal for Secondary Schools* as well as the Eötvös Competition on secondary school students' interest in mathematics. Her study included personal interviews with several well-known Hungarian-born American mathematicians such as George Pólya, Eugene Wigner, and John Kemény. Based on these interviews, Wieschenberg concluded that curriculum and teacher training as well as the dedication of teachers matter if mathematics education is to be successful. Finally, she collected a representative selection of contest/competition problems from 1894 to 1984.

Nearly 20 years after Wieschenberg's dissertation, Connelly (2010) focused her doctoral work on the development of the Hungarian mathematics education system from the first half of the 20th century to the first decade of the 21st century, pointedly considering the changes between 1988 and 2008. Her focus was primarily on gifted education in Hungary because the number "of outstanding mathematicians and physicists had earned Hungary an impressive international reputation" (p. 6). Connelly conducted qualitative research through an analysis of primary source documents, specifically: historical background information from Ministry of Education publications, mathematical and pedagogical professional journals, earlier dissertations in the field, the curricula of the regular and special schools, and national educational policies. She also examined textbooks and school entrance and leaving exams from 1988 to 2008 and conducted a series of in-depth interviews with current Hungarian secondary school teachers, mathematicians, professors, and other educators. Reflecting current media, Connelly investigated websites of individual schools, camps, competitions, and journals for mathematically talented students during the given period. Based on her research, Connelly concluded that although the tradition of excellence remains strong in Hungarian mathematics education, some recent changes challenge the future success of the traditional system. Lastly, she stated that as new restrictions on the selection process for special mathematics classes reflect growing political concerns over elitism, the foundation of the system for talented students could be threatened.

In the development of Hungarian mathematics education specifically after 1945, Fried (2010) presented a general overview. Chapter 9 of the book *Russian Mathematics Education: History and World Significance* explored the influence of Russian mathematics education on education in three socialist countries (Poland, Hungary, and Cuba). In this chapter, Fried described that because of World War II, Hungary suffered many losses and a severe shortage of qualified teachers, particularly mathematics teachers. Because individuals with mathematical training were needed to support the reconstruction of the country, the government provided a "fast-track" education for mathematics teachers. Additionally, the war also resulted in a severe shortage of textbooks and problem collections. Importantly, *The Mathematics Journal for Secondary Schools*, which had been a source of high-level problems before World War II, was not published during the war and did not resume publication until 1947. As a result, mathematics teachers used more and more available Russian texts and problem books to overcome limited resources to practice problem solving. Fried conducted personal communications with important Hungarian mathematics educators such as Imre Rábai, Lóránt Pálma, and Endre Hódi; all of them were influenced by Russian books and methodologies. Lastly, Fried summarized her findings that while many Soviet textbooks exerted a positive influence on mathematics instruction in postwar Hungary, teaching was monitored and controlled and became centralized according to the Soviet model. The methodological and political influence of Soviet mathematics on the teaching of mathematics in Hungary was significant.

3.2 General Research on Periodicals

The aim of this section is to review the research methodology of journals to understand how these studies were structured and which methods the authors applied. The review follows the chronological order in which these journals appeared. The section starts with a consideration of early British journals, with “A Valuable Monument of Mathematical Genius: *The Ladies' Diary* (1704-1840)” written by Albree and Brown (2009) and “The *Cambridge Mathematical Journal* and Its Descendants: The Linchpin of a Research Community in the Early and Mid-Victorian Age” by Crilly (2004). The review then moves on to Furinghetti’s (2003) and Schubring’s (2003) studies of *L’Enseignement Mathematique,* a French journal founded in 1899. The review continues with more current considerations of journals in the 20th century, namely in articles by Hanna (2003) who wrote “Journals of Mathematics Education 1900-2000” and Dabkowska (2019) who wrote “Polish Mathematics Education Periodicals from 1930 to 1950.” The studies discussed here employ noteworthy methodologies that directly informed the current study.

British mathematics journals published between the early 1700s and mid-1800s were analyzed by Albree and Brown (2009) and Crilly (2004). In “A Valuable Monument of Mathematical Genius: *The Ladies' Diary* (1704-1840),” Albree and Brown researched the evolution of this journal during its 137 years of publication. The *Ladies' Diary* played the leading role in the early development of British mathematics periodicals. First introducing the story behind its foundation, the authors then analyzed the structure of the journal, followed by outlining and evaluating some published problems and their solutions. Given the longevity of the journal, Albree and Brown discussed how the subject of mathematical articles changed over the years. They traced an 1817 system of classifying *The Ladies' Diary*’s problems established by

Leybourn, who devised his taxonomy of mathematics by dividing the subject into 25 branches and subdividing some of the more popular branches. Then, Leybourn organized all the problems in *The Ladies' Diary* by categories and subcategories in a table. To help the reader gain insight into the variety of mathematical problems that appeared in *The Ladies' Diary* over 137 years, Albree and Brown applied pie charts that called attention to the more popular branches. They also compiled a complete list of the journal's nine editors and discussed their roles in the journal's evolution. Albree and Brown indicated that organizing the data in tables and graphs paints a general picture of the kinds of mathematics that appeared over the life of *The Ladies' Diary*, and the evolution of English mathematical culture primarily between the 18th century and the first half of the 19th century. Taking a broader perspective of the evolution of mathematical journalism, Albree and Brown proposed that the history of mathematical periodicals as a general form of scientific communication had passed through four stages. The earliest mathematical questions in *The Ladies' Diary* were puzzles and enigmas solved through numbers, and such contrived problems appeared through the long life of the journal. The level of difficulty and seriousness of many questions increased over time, and *The Ladies' Diary* became one force in popularizing mathematics in the 18th century.

Crilly (2004) in "The *Cambridge Mathematical Journal* and Its Descendants: The Linchpin of a Research Community in the Early and Mid-Victorian Age" focused on why British mathematics periodicals were founded and how they managed to exist during the period 1837-1870. The *Cambridge Mathematical Journal (CMJ)*, founded in 1837, was the forerunner of a succession of British mathematics journals during the 19th and 20th centuries. By utilizing archival materials, Crilly examined the founding of the journal (*CMJ*), introduced the editors, and described the evolution of the journal based on historical and social events. To do this, it was important to have a brief overview of Britain's place in the world of mathematics during the first four decades of the 19th century in order to locate the *CMJ* and its descendants in a wider context. Crilly showed that *CMJ* and its successors, the *Cambridge and Dublin Mathematical Journal* (*CDMJ*) and the *Quarterly Journal of Pure and Applied Mathematics* (*QJPAM*), were vital links between academic objectives and economic viability.

As did Albree and Brown, Crilly also organized data in tables. First, he examined data on the number of authors and the number of their publications in the *CMJ*, *CDMJ*, and *QJPAM* between 1837 and 1870. Of the 160 contributors, Crilly concluded that about half of them wrote only one paper. He then tabulated the contributors who published 10 or more papers, compiling a table of the universities and colleges they attended, their years of graduation, and their graduation ranking in their undergraduate degrees. Crilly also recorded the dates of first and last papers published in *CMJ*, *CDMJ*, and *QJPAM*, and the years of the authors' birth and death. He found that a heterogeneous social group comprised the constituency of authors and readers. Crilly examined these journals to offer a sidelight on the establishment of a mathematical community and the growth of mathematics in the United Kingdom.

Furinghetti (2003) and Schubring (2003) analyzed a French journal, *L'Enseignement Mathematique (Mathematics Education),* founded at the end of the 19th century in Paris, later transferred to Geneva, Switzerland. An initial aim of *L'Enseignement Mathématique*, launched in 1899, was to associate the world of teaching with the great international movement of scientific solidarity that was emerging at the end of the 19th century. In "Mathematical Instruction in an International Perspective: The Contribution of the Journal *L'Enseignement Mathematique*," Furinghetti (2003) examined the beginnings of the mathematics journal *L'Enseignement Mathematique* from its establishment in 1899 until 1914. She explained the significant influence the journal had on the rise of an international group of mathematics educators. Her study offered new perspectives on key aspects of the history of mathematics education, including the creation of the International Commission on Mathematical Instruction (ICMI). Furinghetti initially introduced the two founders and editors of *L'Enseignement Mathematique* who strongly defined the journal's characteristics. She also researched the journal's structure and evaluated the past and current relevance of its material. Once again, tables present valuable data in an organized fashion: Furinghetti classified the themes addressed in the journal according to 30 subjects and the number of articles written in each subject every year between 1899 and 1909. She also recorded the most valuable contributors of *L'Enseignement Mathematique*. Furinghetti concluded that the educational reforms discussed in the journal inspired the formation of the ICMI, which in turn used the journal to publish its own studies. Moreover, the journal was a major foundation for new ideas that influenced the world of mathematics and other disciplines.

Schubring (2003) built on the analysis of the same journal in the article "*L'Enseignement Mathematique* and the First International Commission (IMUK): The Emergence of International Communication and Cooperation." The primary question raised was to what degree international communication existed in mathematics education at the turn of the 20th century when the second International Congress of Mathematicians (ICM) met. Schubring created diagrams and charts depicting the nature and structure of mathematics teaching in elementary and secondary schools in France during the second half of the 19th century and concluded that the reform of 1902 enhanced the prominence of mathematics teaching in France, although true change only occurred in 1925. Schubring also helpfully compared the nature and status of mathematics education in France with Germany, Italy, and England. One significant contribution of this journal is how it transformed the international view of mathematics—or, more accurately, allowed an international view to develop. Since *L'Enseignement Mathematique* was the official journal for the entire work of the ICMI, Schubring also examined the foundation of this organization, listing conditions for membership, including charts that distinguish between voting and non-voting members. The analysis of the representatives of member countries and their relationship to mathematics works as a means of understanding ICMI's work which impacted, initially, mathematics in higher education and, subsequently, mathematics in secondary school education. Schubring concluded that perhaps the greatest impact of this journal and the ICMI was in how it helped close the gap between the successful evolution of mathematics and the evolution of mathematics education.

Unlike other articles that focused on earlier publications, Hanna (2003) looked at the development of mathematics education journals exclusively in the 20th century. Hanna's research was limited to *Ulrich's International Periodicals Directory*, which reports 209 journals from 28 countries. The incomplete database had no information for some countries. In "Journals of Mathematics Education 1900-2000," Hanna analyzed the online record of this directory and also organized the information in a table illustrating the number of published journals in each country, followed by a graph showing the number of journals founded in every decade. Then, Hanna examined the characteristics of three major international journals that focused exclusively on present research in mathematics education: *Educational Studies in Mathematics (ESM)* from the Netherlands, *Journal for Research in Mathematics Education (JRME)* from the United States, and *For the Learning of Mathematics (FLM)* from Canada. In reviewing the first two publications, Hanna studied the time and way the journals were founded, their policy statements, and article subjects. She compared their research methodologies and theoretical contexts, focusing on similarities rather than differences. In support of these results, she designed a graph analyzing the research for each journal through a comparison of the number of quantitative and qualitative articles. For the third journal, *For the Learning of Mathematics*, she identified origins, policy statement, and subject matter. Hanna emphasized that all three journals disseminated information and inspired forums that were significant for the professional development of researchers, mathematicians, and educators.

In the development of mathematics education periodicals specifically in a central European country, Dabkowska's (2019) research focused on the history of Polish mathematics education journals published between 1930 and 1950. Located between powerful neighbors such as Russia and Germany, Poland, much like Hungary, is a country with a turbulent and dramatic history riddled by wars and changing borders. Between 1930 and 1950, Poland was an independent state that at first was occupied by Germany and later by the Soviet Union. During World War II, it was liberated from the Germans by the Soviet Union, and in the final years of the war, became reoccupied by the Soviet Union. In analyzing *Parametr* (1930-1932, 1939), *Matematyka i Szkoła* (1937-1939), and *Matematyka* (1948-1950), Dabkowska's qualitative study reviewed the objectives, content, and most important topics of each periodical. Dabkowska categorized the articles based on similar content, such as teaching methods, teaching aids, instructional practices, curriculum, school mathematics, textbook reviews, and foreign influences, in addition to summarizing several articles. Dabkowska identified all authors published in the three journals and identified the most published and influential authors and their biographies (culled from *Internetowy Polski Słownik Biograficzny*). Dabkowska concluded that Poland's history of education and Polish mathematics periodicals were substantially influenced by internal or external politics and ideologies.

In sum, these selected sources contributed to the current dissertation either because of their content (which major factors affected the role and content of the periodicals) or because of their methodology (how to collect and analyze data).

3.3 General Studies of Hungarian Educational Periodicals

Given the focus of this present research, the aim of this section is to illustrate the evolution of the educational journals in Hungary. The section begins with analyses of the development of Hungarian pedagogical journals by Kiss (1881), Baranyai and Keleti (1937), and Jáki (1962). These three works helped to identify sources of secondary educational journals between 1867 and 1956 that are spotlighted in the present study. This section continues with Mészáros's (1992) analysis of the 100-year journal, *Magyar Paedogogia*. The section ends with a review of an article by Hajnal (1992), who analyzed different eras of *Journal of the National Association of Secondary School Teachers* for its 125th anniversary. In understanding these researchers' historical analyses of Hungarian educational journals, the present researcher was greatly informed by examples of historical methods that enhanced the process of this study.

Though not specifically aimed at mathematics education, Kiss's (1881) book traced the history of pedagogical movements and literature in Hungary through the evolution of educational journals. He started with the official Latin and German publications: *Merkur* edited by György Kovachich and *Novi Ecclesiastico Scholastici Annales Evangelicorum,* then investigated the first education periodical in Hungarian, *Religion and Education,* published by the Catholic Church in 1841. In the following year, *Protestáns Egyházi és Iskolai Lap (Protestant Church and School Journal)* was founded by the Protestant denomination. In 1843, the *Közlemények a Kisdedóvás és Elemi Nevelés Köréből (Publications in the Field of Preschools and Elementary Education)* was published in Hungarian. This detailed list of the pedagogical books and journals published between 1786 and 1881 included editors' names and the years and cities of publication.

Baranyai and Keleti (1937) expanded their search to include journals into the 20th century by collecting and analyzing bibliographies of Hungarian pedagogical journals-between 1841 and 1936. Their study contained exact titles, short descriptions of the journals, and years and cities of publication. Baranyai and Keleti also included several indicators such as a chronological publishing timeframe, the associations which published the journals, and their geographic locations. The goal of their work was to speed up the scientific research, retrieval, and production of subject bibliographies by providing information on the 400 journals they identified. Table 3.1 replicates Baranyai and Keleti's organization of the number of educational journals between 1841 and 1936.

Table 3.1: Number of Published Educational Journals Between 1841 and 1936

Year	Number of Published Educational Journals
1841	1
1842-1848	6
1849	---
1855	1
1868-1870	25
1900	53
1914	93
1918	55
1920	31
1930	59
1936 (November)	69

Baranyai and Keleti concluded that during the Passive Resistance between 1849 and 1867, which followed the failed revolution against the Habsburg Empire, Hungarian education periodicals were not published, except for one effort by Lajos Szeberényi in 1855. After the

Compromise of 1867, an agreement with the Habsburgs, the educational system led by József Eötvös, the Education Minister, changed fundamentally. As a result of the educational policy of 1868, teachers' associations were formed and began to publish their own periodicals. Although 25 new journals were published between 1868 and 1870, many lasted for only a couple of editions; moreover, the articles mostly discussed education in general and did not address specific subject matter. Baranyai and Keleti highlighted that specialization began with the establishment of the journal *Országos Középiskolai Tanáregyesületi Közlöny (Journal of the National Association of Secondary School Teachers*), the official publication of this organization, in 1868.

Baranyi and Keleti also noted that between 1870 and 1914, pedagogical journals were characterized by mixed content that centered on educational and school issues. During World War I and the subsequent Treaty of Trianon, however, the number of Hungarian pedagogical journals decreased from 93 in 1914 to 31 in 1920. After World War I, pedagogy came to the forefront as a general interest in the theoretical sciences, leading to the publication of a significant number of new pedagogical journals between 1920 and 1936.

Following the structure of Baranyai and Keleti's collection and essentially adding to the full picture of Hungarian journals, Jáki (1962) published a bibliography for the period 1937-1958. Like Baranyi and Keleti, Jáki also summarized the social-political circumstances of these publications and organized the data into tables. First, he presented the number of educational journals between 1841 and 1955 in graph form (see Figure 3.1). Jáki found the most striking feature of pre-1945 journal literature was the large number of journals, although he felt the large volume did not equate with the high efficiency of the literature; rather, it seemed to be associated with disintegrating forces. The journals were isolated from each other, each one going its own way. Sometimes, the same topics were discussed in several journals.

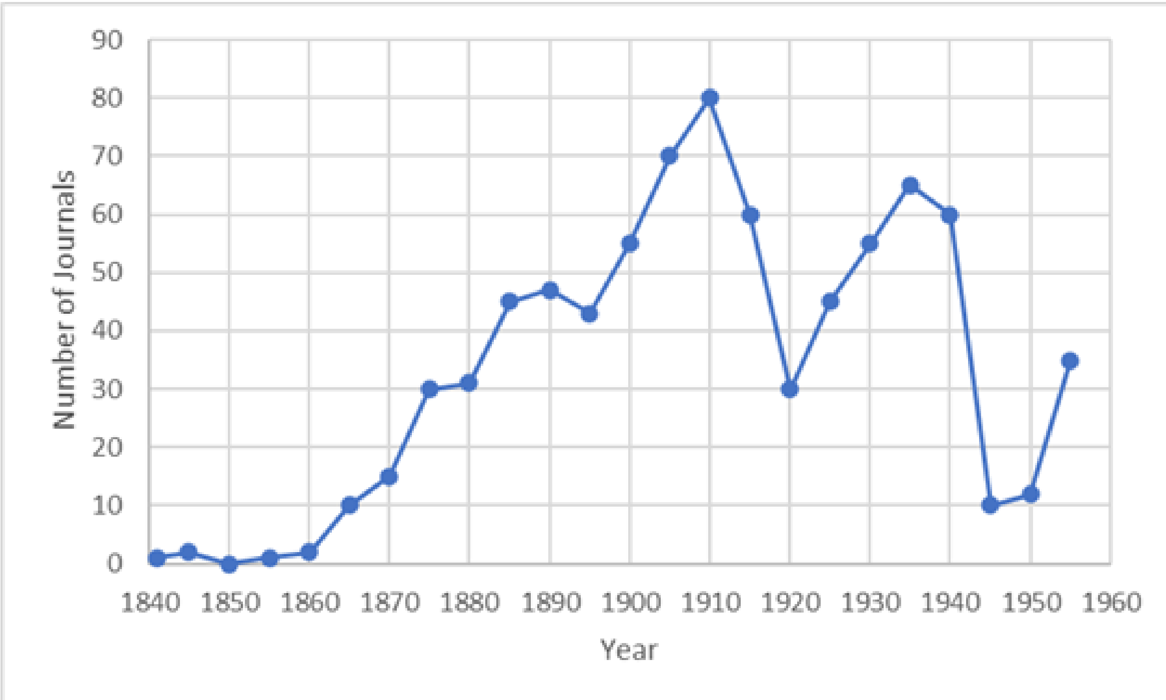

Figure 3.1: Number of Educational Journals Between 1841 and 1955

Then, Jáki collected further information about the publishers of the educational journals (see Table 5.2). He found that between 1841 and 1944, journals were published by various organizations, institutions, associations, and denominations; about half were published by teachers' associations/unions. The content appearing in the journals varied widely, with associations of elementary school teachers arranging their material by geographic area and associations of secondary school teachers organizing by school type. Because publishing journals was difficult and, often, isolating for those working to produce a publication, the quality and direction of the journal content varied.

Table 3.2: Publisher of Journals 1841-1958

Publisher	1841-1936 (%)	1937-1944 (%)	1945-1958 (%)
Ministries, State Central Offices	0.6	2.1	35.5
Churches	7.7	7.1	3.3
Associations, Unions	48.6	59.4	18.4
Administration of Education	----	6.1	28.5
Institutions	2.0	1.0	13.3
Schools	0.5	4.1	1.0
Private Companies	40.6	20.2	------

Jáki attributed the sharp decline in the number of periodicals in 1940 to the difficulties imposed by World War II and the Press Law issued in 1939. During the implementation of this law, permissions for many journals to publish were revoked and some journals were compelled to merge. After the war, only six journals remained to continue their work.

Jáki further noted that by 1950, because of the decision of the ruling Hungarian Workers' Party, all journals in existence before 1945 were abolished so that a Marxist-style journal literature embracing the goals of socialist public education could be developed instead. The 1950 party resolution was a dividing line in the history of pedagogical journal literature in Hungary, launching the centralization of journal literature. Having multiple journals would have fragmented the efficiency of the literature and hindered the creation of a unified pedagogical public spirit. Thus, the centralized management of socialist public education did not require a larger number of journals; instead, it required standardization and improved efficiency of those that already existed. Journals in specialized fields were now published, such as *A Matematika Tanítása (Teaching of Mathematics)*, the first journal dedicated to mathematics education after World War II. As Jáki (1962) wrote, "In essence, the Marxist periodicals, which embrace the aims of socialist public education, evolved in the 1950s" (p. 84).

One of the six educational journals that remained viable after 1945 was *Magyar Paedagogia (Hungarian Pedagogy)*, the journal of the Hungarian Pedagogical Society, which dealt with all branches of educational issues and public education. In "*Magyar Paedagogia* 1892-1992," Mészáros (1992) described the development of this 100-year journal. The oldest Hungarian educational journal was founded in 1892, but its publication was interrupted between 1947 and 1961. Mészáros stated that although the pedagogical direction of the journal changed several times, a considerable part of its success has always been high quality.

First, Mészáros analyzed the editing concepts and content development evident between 1892 and 1947. The structure of the journal was simple, containing straightforward articles and extensive domestic and foreign literature reviews. Mészáros found that the articles at the outset reflected the traditional pedagogical approaches of the late 19th century. After the turn of the century, representatives of reformist pedagogical trends began to surface in the journal. In the 1920s and 1930s, the editors took the initiative to publish studies on child psychology and the "New School." Mészáros further discussed that from the second half of the 1920s, the editorial staff showed increased interest in newer educational trends in Western Europe, especially in Anglo-Saxon areas. Most innovatively, the editors also moved further around the globe: in 1936, the first article on Japanese education was published in the journal. During these decades, the editorial board of *Hungarian Pedagogy* also paid special attention to the educational and cultural situation of Hungarians living in areas annexed after the Trianon Treaty. Mészáros wrote that in the mid-1930s, the Hungarian Pedagogical Society and its journal *Hungarian Pedagogy* held firm to solid objectivity during the Hungarian government's policy leading to a new national socialist German education. For obvious reasons, the total number of pages of the journal volumes fluctuated between the two world wars.

Next, Mészáros (1992) described that in 1947, the journal ceased publication because of Soviet control. For half a century, *Hungarian Pedagogy* had been a forum of balance and conciliation for ongoing traditional pedagogical theories and reformist tendencies. In 1961, the Hungarian Academy of Sciences reinstalled the journal to strengthen socialist pedagogy. Since the 1970s, topics covered by the journal have been extended to introduce reviews, research, and educational experiments by Western European and American authors. Finally, Mészáros concluded that "between 1961-92 *Hungarian Pedagogy* was one of the most prominent national educational journals, a true mirror of the times when it was edited, written, read and studied" (p. 21).

The first association specializing in Hungarian secondary education was founded in 1867. In "125th Anniversary—Commemoration of the National Association of Secondary School Teachers," Hajnal (1992) presented the evolution of the Association and its journal, *Az Országos Középiskolai Tanáregyesület Közlönye* (*Journal of the National Association of Secondary School Teachers).* The Association existed between 1867 and 1948, and its journal was published between 1868 and 1944. Hajnal divided the era into three periods: (a) the first decades, the era of initiatives—from 1868 to early 1890s; (b) the era of grinds—from the mid-1890s to 1914; and (c) the forced track—from 1914 to 1944. Hajnal analyzed the history of the Association and its journal in detail.

First, Hajnal described the history of the Association and its journal between 1867 and early 1891, the era of initiatives. At the beginning, the Association sought to establish good relations with the state, especially with the Ministry of Religion and Public Education. Since one of the challenges for the Association was to finance its journal, the Ministry financially supported the publication and, in return, they ordered the journal to review newly published textbooks. The debate over the new curriculum introduced in 1871 resulted in the decreasing influence of the National Association of Secondary School Teachers in the National Council for Public Education. The ministerial aid given for the publication of the journal was abolished in the mid-1870s. The Association presented the proposal of changes in the new bill to the House of Representatives through Minister Trefort in 1873. Many articles in *Journal of the National Association of Secondary School Teachers* discussed the long and heated debates until the fifth version of drafts became law in 1883. In the second half of the 1880s, the focus of the articles shifted toward didactic issues and the need to reform teaching methods.

Next, Hajnal moved to the era between 1892 and 1914, the era of grinds which the author refers to heated debates that it could be called a battle over the new draft laws submitted to the House of Representatives. Compared to them, there were only minor differences of opinion in matters of education. In the initiative by the Ministers Eötvös and later Wlassics, the idea of a unified high school intensified. They also emphasized the importance of reducing the overload of students and teachers, strengthening the national elements in the curriculum, and developing practice sections in teacher training. By the turn of the 20th century, changes in the government, parliamentary struggles, and debates in professional groups directly affected the Association, and thus the number of members fluctuated. Attitudes had been slow to change in *Journal of the National Association of Secondary School Teachers*; the subjects of the articles were narrowed down to fewer content areas. However, the outstanding work of the Hungarian Mathematical Reform Subcommission, which had received national and international attention, was presentedin the journal.

According to Hajnal, the last period between 1915 and 1944 was a “forced track.” The dramatic changes resulting from World War I and the Treaty of Trianon affected all areas of life.

During World War I, the Association adapted to the new circumstances, its journal often reporting on the military services and deaths of teachers. The situation of teachers in schools was also worsening year by year. Despite all the difficulties, the 50th anniversary in 1917 was commemorated at the annual general assembly. In March 1920, at the extraordinary general meeting of the Association, some members were excluded because of their political views or religion. After 1920, the number of professional pedagogical associations in general decreased, and their roles became polarized between the two world wars. The National Association of Secondary School Teachers and its journal continued to exist. Moreover, *Journal of the National Association of Secondary School Teachers* dealt with preparatory work and the impact of the new laws and curricula enacted in 1920s and 1930s, it also published valuable studies dealing with subject-specific and didactic issues. One of the new teaching methods in the early 1940s was organized demonstration classes to which interested parents were invited; during the 1943-1944 school year, the journal reported on these classes.

Finally, Hajnal noted that the three issues of the journal's 78th volume in 1944 were published with less than 20 pages. At the time of the publication of the last issue in 1944, the Soviet troops were preparing to occupy Budapest. After World War II, the Communists from Soviet Union overtook Hungary completely and began to implement a new educational system. By 1948, the National Association of Secondary School Teachers had ceased to exist.

In sum, all of these selected sources discussed in this review contributed to helping the current researcher illustrate the evolution of educational journals in Hungary in this dissertation.

3.4 Conclusion

This literature review examined publications that centered on the history of mathematics education in general and in Hungary specifically through periodicals. This research informed the present study by illustrating the types of questions that this researcher chose to explore and which methodologies were appropriate for analyzing Hungarian journals. While a good amount of research has been conducted on the evolution of Hungarian journals, there remain many gaps in the literature. For example, *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* have only been partially investigated. Many articles were broadly written and lacked sufficient in-depth detail. Given the limitations of the existing literature to answer this study's research questions directly, the researcher conducted this analysis to help fill some of the void.

Chapter 4: Methodology

The purpose of this study was to determine how changes in the evolution of Hungarian secondary mathematics education between 1867 and 1956 were reflected in journal articles of that time. During that time, Hungary had a turbulent period with the following forms of state: the Austro-Hungarian Monarchy (1867-1918); the Hungarian Republic led by a short-lived leftist government (1918-1920); the Hungarian Kingdom without a King (1920-1944); the Coalition Period (1945-1949); and the Hungarian People's Republic, controlled by Soviet Union (1949-1989). The time period of this study ends in 1956 when Hungary had a revolution against Soviet control. This study employed historical-research methodology, which involves studying, understanding, and interpreting past social and political events. Studying journal articles can provide a real-time analysis of the effect of social and political changes have which influenced mathematics education.

To complete this study, the researcher followed the methodologies used by Albree and Brown (2009), Crilly (2004), Hanna (2003), Furinghetti (2003), and Dabkowska (2019), but with some modifications. The researcher realized that these studies were conducted in various countries and, thus, required changes because Hungary was affected by different historical events. Moreover, the approaches taken by each author were specific to their investigated journals and required modifications because of differences between the structure and content of the Hungarian journals and journals of the other countries. Therefore, the researcher made needed modifications to account for the differences between countries and approaches taken.

4.1 Methodology of Historical Research

Howell and Prevenier (2001) described the role of the modern historian as an analyst who explains and compares documents. They stated that although sources of history can never be fully reliable, the historian's job is to make them into a meaningful story that helps to explain past events. This researcher collected educational periodicals published between 1867 and 1956 as primary sources and analyzed them using historical research methodology.

Karp (2014) focused on how to develop a research methodology in the field of the history of mathematics education. He discussed what the history of mathematics education investigates and how researchers carry out those investigations in that field. According to Karp, "history of mathematics education is a part of social history, which becomes meaningful only when it includes social analysis and examines what happened in mathematics education in connection with the processes that were taking place in society around it" (pp. 9-10). Moreover, Karp indicated that the history of mathematics education has a twofold nature: it is historical in terms of methodologies, and it is mathematical-pedagogical in terms of the object of study. The present study closely followed Karp's methodology by analyzing major political and social factors that affected the role and content of key periodicals in Hungarian secondary mathematical education between 1867 and 1956.

In addition to Karp's (2014) view, Karp and Furinghetti (2016) described in "History of Mathematics Teaching and Learning Achievements, Problems, Prospects" the current focus of study in the history of mathematics education. They recommended investigating the methods used in mathematics education by mathematics educators who were active during a particular time. Following this advice, the present researcher analyzed the content and methods used by several educators and also provided a brief bibliography of the most influential and prominent authors.

4.2 Methodology of Journal Analysis

Between 1867 and 1956, Hungary underwent major political and social changes—a dual Monarchy with Austria, independence as a truncated state, and occupation by Germany and later the Soviet Union. These changes significantly altered Hungary as a country and impacted its education system. While researchers have partially explored secondary mathematics education during the period of 1867-1956, the present study focused specifically on the evolution of Hungarian secondary mathematics education by utilizing a form of journal analysis which has previously not been considered.

In modifying the methodology for this study, the researcher drew from the methodology used by Hanna (2003) to identify and analyze available Hungarian educational periodicals from 1867 to 1956. In addition, the researcher classified the educational periodicals listed in the bibliography by Baranyai and Keleti (1937) and Jáki (1962). This list of periodicals discussing mathematics for secondary schools, particularly for teachers in Hungary between 1867 and 1956, is presented in Table 4.1.

After reading the content and mission statements for all of these periodicals, the researcher concluded that *Journal of Mathematics and Physics, The Mathematics Journal for Secondary Schools (KöMaL),* and *High School Mathematics and Physics Journal* contained only mathematical problems and were not educational journals per se. *Didactics Journal for Arithmetic and Sciences* contained mainly teaching methods in the sciences, with only a few articles discussing issues in mathematics education. Based on the content of the journals, the researcher selected *Journal of the National Association of Secondary School Teacher* and *Teaching of Mathematics* for full analysis in this present study.

Table 4.1: Published Periodicals Between 1867 and 1956

Periodicals	Published Years
Az Országos Középiskolai Tanáregyesület Közlönye *(Journal of the National Association of Secondary School Teachers)*	1867-1944
Országos Polgári Iskolai Tanáregyesületi Közlöny *(Journal of National Civic School Teacher's Association)*	1876-1947
Mathematikai és Physikai Lapok *(Journal of Mathematics and Physics)*	1892-1943
Középiskolai Matematikai Lapok (KöMaL) *(The Mathematics Journal for Secondary Schools)*	1894-Present
Középiskolai Matematikai es Fizikai Lapok *(High School Mathematics and Physics Journal)*	1925-1939
Mennyiségtani és Természettudományi Didaktikai Lapok *(Didactics Journal for Arithmetic and Sciences)*	1943-1944
A Matematika tanítása *(Teaching of Mathematics)*	1953-1956 1958-1990

The *Journal of the National Association of Secondary School Teachers* was published between 1868 and 1944 by the National Association of Secondary School Teachers, one of Hungary’s major teachers’ associations. Published for 78 consecutive years, it is one of the oldest pedagogical journals with extensive longevity printed in Hungarian.

Teaching of Mathematics was published between 1953 and 1956 and, again, between 1958 and 1990. In 1950, all previously published journals were discontinued because of Soviet political influence. In its place, based on Soviet ideology, centralization of journal literature was established, especially in fields of specialization. Appearing in 1953, *Teaching of Mathematics* was the first journal dedicated to only primary and secondary mathematics education.

The researcher collected all complete volumes of both selected journals at the National Széchényi Library (Országos Széchényi Könyvtár) and the National Educational Library and

Museum (Országos Pedagógiai Könyvtár és Múzeum) in Hungary. All materials were in Hungarian and translated by the researcher.

The researcher's analysis of *Journal of the National Association of Secondary School Teacher* borrows approaches utilized similarly by Hajnal (1992), Albree and Brown (2009), and Crilly (2004)—namely, dividing an era into shorter time periods. Even though Hajnal (1992) divided the 78 years of *Journal of the National Association of Secondary School Teacher* into three periods, as mentioned in Chapter 3, this researcher followed the occurrence of major historical events and first divided the era into two key periods: (a) the Dual Monarchy called the Austro-Hungarian Monarchy (1867-1918), and (b) the independent state called the Hungarian Republic (1918-1920), followed by the Hungarian Kingdom without a King (1920-1944). The reason for changing the number of periods was due to a major turning point, the formation of the state in Hungary. After World War II, the country established the Hungarian People's Republic, controlled by the Soviet Union in 1949. By contrast, because of the short 3-year span (1953-1956) of the current analysis of *Teaching of Mathematics*, the researcher did not divide that era. As a result, the researcher organized the analysis of the evolution of Hungarian secondary mathematics education between 1867 and 1956 into three periods: (1) 1867-1918: the Austro-Hungarian Monarchy, (2) 1918-1944: the Hungarian Republic, followed by the Hungarian Kingdom without a King, and (3) the Hungarian People's Republic (1949-1956).

In addition, the analysis of both *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* closely aligned with the methodology used by Furinghetti (2003) and Dabkowska (2019), which involved thematic analysis of one French and three Polish journals published in the first half of the 20th century. First, the researcher of the present study provided summaries of the journals and general characteristics of their themes.

Then, she examined the articles specifically regarding mathematics education in *Journal of the National Association of Secondary School Teacher* and exploring secondary mathematics in *Teaching of Mathematics*. The classification of those articles closely followed Dabkowska's (2019) approach. To investigate the themes explored in the journals, the researcher classified all mathematics-related articles into the following main categories:

- Curriculum - articles reviewing the school program in general or describing specific problem areas of the curriculum.
- Teaching Methods - articles related to the process of teaching and learning mathematics.
- School Mathematics - articles describing mathematics concepts, proofs of theorems, or articles illustrating the history of mathematics.
- Book/Textbook Review - articles including reviews of books and textbooks.

The detailed coding for main category can be found in Appendix A. Any articles that did not fit specifically named categories were placed in "other." Because some articles contained content related to multiple categories (especially for curriculum and teaching methods), the researcher used her best judgment to place the articles into the most appropriate category.

Within each main category, the researcher further subcategorized the content by mathematics subject matter such as arithmetic, algebra, geometry, general, and added a subcategory called ideology in *Teaching of Mathematics*. Any article that introduced more than one subject (e.g., algebra and geometry together) was placed in the "general" subcategory. In *Teaching of Mathematics*, the subcategory "ideology" included papers devoted to ideological issues (mainly socialist worldview aspects) such as political and moral standards or introduction of polytechnic education. These ideological issues of mathematics education could not be placed into mathematics subject matter such as arithmetic, algebra, and geometry.

The researcher also explored the secondary mathematics-related articles of both journals, but only selected the most representative topics which she identified as sharing the same theme, topics, and conclusions as other articles. Thus, rather than presenting all articles in the journals, the researcher was able to streamline the choices by focusing on noteworthy articles for discussion.

Thus, the researcher reviewed and analyzed objectives, content, and most important topics of both periodicals in a chronological sequence. In doing so, the researcher could show how authors shared their common, or sometimes opposite, opinions. The researcher also analyzed the articles in the order in which they were published to provide insight into how the topics may have changed during the lifetime of the journals. Any articles categorized as “other” by main category was excluded from this analysis for convenience.

The researcher identified all editors and the majority of authors for both journals. Information for editors’ and authors’ biographies was obtained at Arcanum Digitheca (https://www.arcanum.hu/en/adt/), *Lives and Works of Hungarian Writers* by Szinnyei (1914), and *Hungarian Biographical Lexicon* by Kenyeres (2001). If the biographies of the main contributors were found, the researcher specified their years of birth and death, the towns where they worked, their high school and/or university teaching experience, and their achievement of doctorate degrees. The researcher than analyzed and classified these data on contributors into tables that followed the design utilized by Albree and Brown (2009) and Crilly (2004).

Chapter 5: Analysis of *Journal of the National Association of Secondary School Teachers*

The researcher strove to contribute to the social history of Hungarian secondary mathematics education by employing historical-research methodology of journals in the field of mathematics education. In this chapter, the researcher analyzed all articles regarding secondary mathematics education in all 78 volumes of *Journal of the National Association of Secondary School Teachers* published between 1868 and 1944.

The Austro-Hungarian Compromise of 1867 was a milestone that resulted in the dual Monarchy of Austria-Hungary after a nationwide Passive Resistance, followed by a failed revolution against the Habsburg Empire. After the Compromise, the Hungarian economy began to flourish, and a liberal government was formed. The governing power considered it very important to support the culture of academic associations and, especially, to strengthen the strata of the intellectual profession in Hungarian society. Teachers and teachers' organizations have always played an important role in the development of school affairs in Hungary by increasing the social acceptance and support of the school as an institution and structuring the national education system. In this spirit, the National Association of Secondary School Teachers was founded in 1867. The members of the Association could be university professors, teachers of any secondary institutions (gymnasia, real school, vocational schools, etc.) as well as teacher candidates. According to its founding document (Statutes), the primary task of the Association was to organize meetings that would debate important educational issues. The aim of the Association was to "monitor the cause of education in all directions, and in particular to promote the cause of secondary school education and upbringing" (Keller, 2007, p. 76). Each year, the president reported to the general meeting on the annual work and finances of the Association; then, the general meeting elected the officers. Within the Association, four departments were established: education (also dealing with educational history and statistics); linguistics and literature; the humanities, history, and geography; and science, mathematics, and drawing studies. The groups monitored corresponding professional literature and newly published textbooks, presented lectures, and formulated and discussed proposals (Hajnal, 1992).

In 1868, the Association launched its regularly published journal (10 issues per year), *Journal of the National Association of Secondary School Teachers* (see Figure 5.1). Operating continuously until 1948, the Association published 77 full volumes of the *Journal* between 1868 and June of 1944. The 78th volume contained only four issues, with the last published in December 1944. After World War II, the Association tried to survive, but due to political pressure, it finally ceased in 1948.

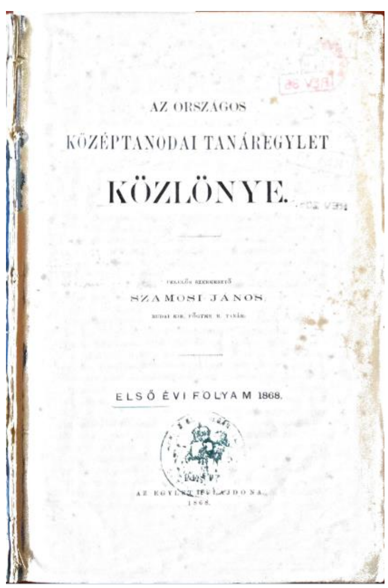

Figure 5.1: Cover Page of First Volume of *Journal of the National Association of Secondary School Teachers*

5.1 Structure of the Journal

Journal of the National Association of Secondary School Teachers examined all aspects of secondary education and provided news about the life of the National Association of Secondary School Teachers. The journal was published monthly, except for school summer breaks; it was a forum where authors discussed both general and subject-specific issues in secondary education. In its early years, *Journal*'s columns contained editorials, proposals and studies, descriptions of public education issues and matters concerning the Association, appointments of teachers, celebrations of special events, curriculum revisions, teacher training, news from the National Public Education Council, school and financial affairs, literary reviews (book reviews and journal descriptions), and sundry other items. Later, *Journal* was expanded with supplementary sections, which featured news from teacher practice and the field of foreign affairs. The length of the publication varied: The number of total pages of the journal fluctuated between 20 and 1,050 throughout the 78 volumes (Figure 5.2).

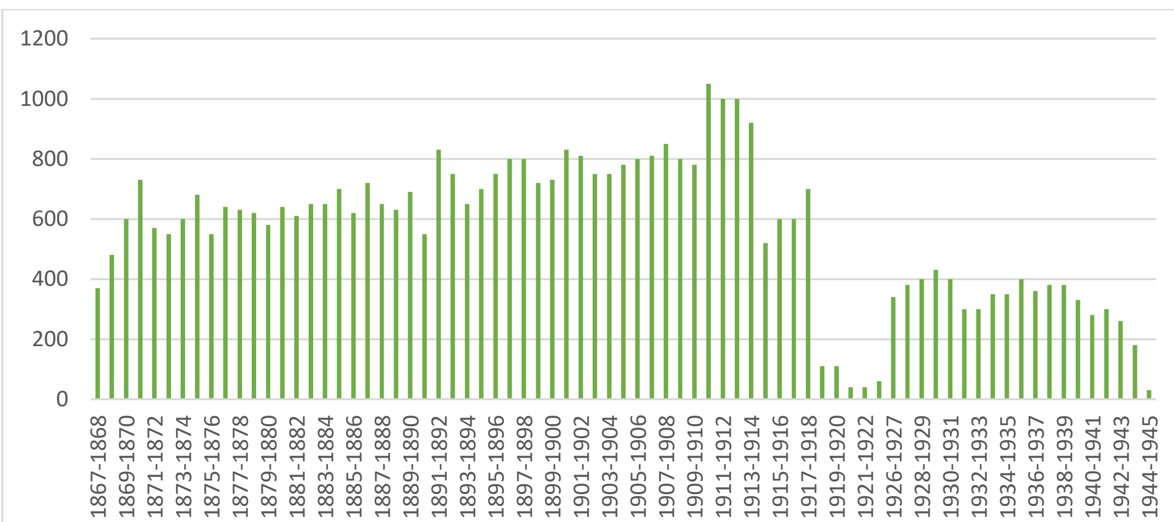

Figure 5.2: Number of Total Pages in *Journal of the National Association of Secondary School Teacher* Between 1868 and 1944

In all 78 volumes of the journal, the Table of Contents at the beginning of each issue presented a categorization of the articles within. Between 1868 and 1944, many headings were the same, although the titles of some sections eventually changed. For example, one heading discussing current issues changed from the word "Discussions" between 1868 and 1875 to "Proposals and Studies" between 1905 and 1915. In some larger volumes (during the 1910s), the sections were more detailed than in shorter volumes (especially during the wars). The articles were published under the following headings:

- EDITORIALS, DISCUSSIONS: This section contained a variety of papers related to curriculum revision, teaching methods, educational laws, teacher training, and news. This section typically contained most of the articles, each of which varied in length from 2 to 20 pages.
- BOOK AND JOURNAL DESCRIPTIONS/REVIEWS: These sections were dedicated mainly to providing information about new books and journals as well as their Table of Contents. The sections also contained many detailed book reviews and debates between reviewers and authors. In some volumes, this section was divided into Hungarian and foreign book and/or journal reviews. The length of the reviews varied between a couple of sentences and six pages.
- ASSOCIATION NEWS: This section included all types of news about the status of the National Association of Secondary School Teachers. It also contained the life and activities of the Association, including its archives, personal appointments, celebrations of special achievements, school and financial affairs, literary bulletins, meeting overviews, and awards received by Hungarian teachers. The length of articles in this section ranged from a few sentences to one page.

- MISCELLANEOUS, CHRONICLE, NOTES: These sections included information on educational decrees, lists of new books and conferences, short biographies of famous teachers, and news about a teacher's retirement. Some issues contained a list of active and/or retired members. During World Wars I and II, this section contained remembrances of deceased members.

It is important to keep in mind that *Journal of the National Association of Secondary School Teachers* included articles in all content areas taught in school (e.g., history, literature, science, mathematics, languages, physical education, etc.). However, this researcher examined only articles regarding *secondary* mathematics education that appeared in the 78 volumes of *Journal of the National Association of Secondary School Teachers*. The majority of mathematics articles were published in the sections dedicated to Discussions (later Proposals and Studies) and Book and Journal Descriptions/Reviews. Based on the content of those articles, the researcher divided the articles related to mathematics education into specific categories: curriculum, teaching methods, book/journal reviews, and others. Within each category, the articles were further divided into subcategories by subject area such as arithmetic, algebra, geometry, general, and other. Articles which introduced more than one subject (e.g., algebra and geometry together) were placed in the "general" subcategory. Articles that did not fit into specific categories or subcategories were deemed "other." The number of articles related to mathematics fluctuated across all 78 volumes (Figure 5.3). A detailed list of articles related to mathematics education in this *Journal* can be found in Appendix B. This table contains authors' names, titles, published year and volume, and categories/subcategories of all 290 articles.

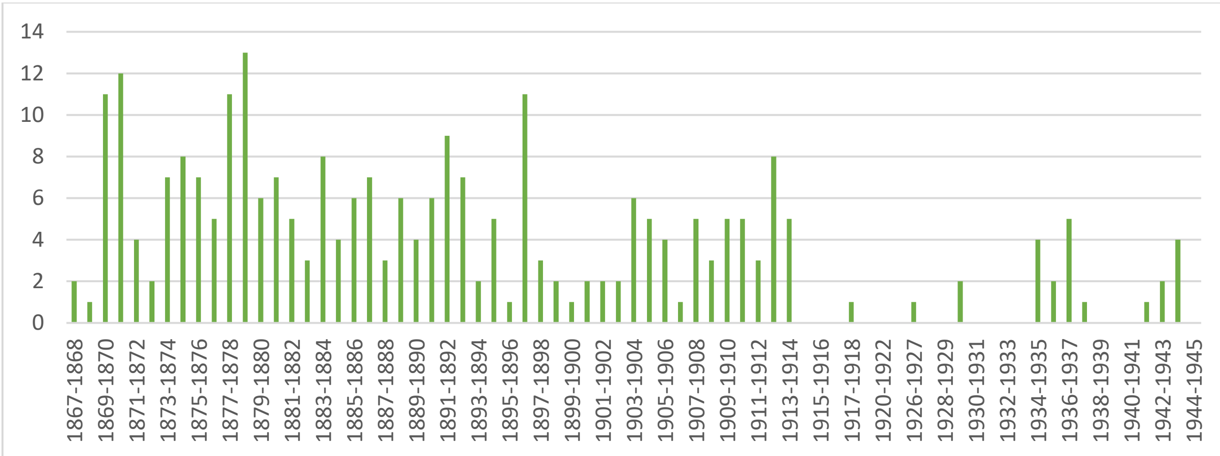

Figure 5.3: Number of Mathematics-Related Articles in *Journal of the National Association of Secondary School Teachers* Between 1868 and 1944

The researcher divided the analysis of the evolution of *Journal of the National Association of Secondary School Teachers* between 1868 and 1944 into two periods following the occurrence of major historical events: (1) 1867-1918: the Austro-Hungarian Monarchy, and (2) 1918-1944: the Hungarian Republic, followed by the Hungarian Kingdom without a King. Since the Austro-Hungarian Monarchy provided favorable conditions for the modernization of the Hungarian school system, the *Journal* published 263 mathematics-related articles (about 90% of the total number of articles). Every volume contained articles related to mathematics education until 1914. The largest number of articles (13) discussing mathematics was published in 1879. When Hungary was defeated at the end of World War I in 1918, and the Treaty of Trianon in 1920 redefined the country's borders, all areas of life, including education, were drastically affected. The population as well as the geographic area of Hungary decreased, and teachers found it increasingly more difficult to maintain their lifestyle and profession. As a result, the National Association of Secondary School Teachers faced unanticipated challenges in sustaining the journal's regular publication. These political and social changes substantially affected the length of the issues, including the appearance of articles devoted to mathematics education. Particularly after 1914, some volumes of the journal included no mathematics articles. During the second era between 1918 and 1944, the total number of mathematics-related articles decreased to 27 (about 10% of the total articles). The distribution of all mathematics articles in the journal according to categories and subcategories between these two periods can be found in Table 5.1.

Table 5.1: Distribution of Articles Regarding Mathematics Education in *Journal of the National Association of Secondary School Teachers* Between 1868 and 1944 by Category and Subcategory

	1868-1918	1919-1944	Total
Curriculum	**51**	**7**	**58**
Arithmetic	5	---	5
Algebra	4	2	6
Geometry	13	1	14
General	29	4	33
Teaching Methods	**65**	**3**	**68**
Arithmetic	19	---	19
Algebra	22	2	24
Geometry	17	1	18
General	7	---	7
Book/Journal Reviews	**134**	**16**	**150**
Arithmetic	27	1	28
Algebra	42	5	47
Geometry	43	3	46
General	22	7	29
Other	**13**	**1**	**14**
Arithmetic	1	---	1
Algebra	2	---	2
Geometry	1	---	1
General	9	1	10
Total	**263**	**27**	**290**

All articles in the journal, including mathematics-related papers, were written in the Hungarian language. Some articles were written collaboratively by two authors. Secondary school teachers and representatives of postsecondary institutions (university professors) were the typical authors of these articles; a few were well-known Hungarian mathematics educators. There is no discernable pattern in the length of the articles; some were quite long (the longest is

60 pages) and thoroughly elaborated with examples, while others were comparatively short (2 pages) and broader in their discussion. On average, articles on curriculum and teaching methods were the longest. Reviews of journal articles and textbooks ranged from a couple of sentences to 8 pages (average 1-3 pages).

The following sections present an analysis of mathematics articles in their categories in chronological order of publication during the two periods of the journal: (1) 1868-1918: the Austro-Hungarian Monarchy, and (2) 1918-1944: the Hungarian Republic, followed by the Hungarian Kingdom without a King. Given that a review of all relevant articles would consume more discussion than is feasible for the spatial limitations of this dissertation, the researcher selected particularly noteworthy articles on unique topics as well as articles discussing similar topics that can serve as a comparative basis on how a discussion on one topic evolved over time. The section entitled "Contributors to the Journal" introduces the editors and the most prominent and influential authors whose work appeared in the journal.

5.2 1867-1918: The Austro-Hungarian Monarchy

From its inception of publication in 1868 until the conclusion of World War I in 1918, the journal published 263 articles on mathematics education. About 20% of these articles discussed curriculum, 24% introduced recommendations for teaching methods, and 51% included book/journal reviews (Table 5.1).

5.2.1 Curriculum

The curriculum-related articles in the *Journal of the National Association of Secondary School Teachers* referred to specific problem areas of the Hungarian mathematics curriculum or discussed general issues related to the curriculum. These articles pointed out both the positive and negative characteristics of the mathematics curriculum and often offered ideas to resolve current problems. Authors referred to programs from foreign countries to illustrate how they differed from programs in Hungary and were eager to share such knowledge with colleagues.

Below, discussions of selected articles are presented in chronological order within categories and subcategories and reflect views of the status of mathematics education during different decades, in addition to recommendations for content in arithmetic, geometry and algebra; the possible implementation of other subjects such as statistics; suggestions for curricula for different school types such as real schools and unified high schools; and the work of the Hungarian Mathematical Reform Subcommission.

Journal articles began discussing the status of mathematics education in the early 1870s. For example, Császár (1870) stated that the level of mathematics was suitable for primary and early secondary students in Hungary. At the upper level, some students might achieve excellent results in other subjects, but would have difficulty solving simple mathematics problems. Based on his broad teaching experience in both rural (countryside) and urban (the capital) schools, Császár described a few reasons for what he believed was unsuccessful mathematics education: (1) the subject itself is challenging; (2) because of different paths to enter secondary schools in Hungary, a thorough mathematics education had not been provided in the lower grades, and thus students entering 4-year and 6-year upper gymnasia had a weak mathematics background; (3) private students were introduced to Grade 6 and 7 subjects via only one private instructor who often had limited mathematics knowledge; and (4) many teachers lacked official teacher education, holding only a maturity exam certification from before 1848. According to Császár, these problems created a weak mathematics education overall, while the outdated Hungarian maturity exam was not accepted in many European countries. Lutter (1874a, 1874b) also analyzed why the Hungarian schools were not successful. He described the differences between the 8-year Hungarian and the 9-year Prussian mathematics education, concluding that "since gymnasiums in Germany spend 9 years under the fortunate conditions and with a larger number of hours as the part of the mathematics studies that we do in 7 years (the analytical geometry presented in our 8th grade), it is no wonder that the students in German gymnasium understood more thoroughly than ours" (p. 482).

To improve mathematics education, authors recommended different solutions during the first period (1868-1918) of the journal. The researcher organized the focus of the curriculum-related articles into two groups: (1) curriculum issues and curriculum experiments until the turn of the 20th century, and (2) reform movements in the early 1900s.

5.2.1.1 Curriculum Issues and Curriculum Experiments. After the Compromise of 1867, Eötvös, the Education Minister, aimed to reshape the entire Hungarian public education system radically in a multi-stage process. While the Public Education Law, Vol. 38, in 1868 reorganized the primary school system, there was no national curriculum for secondary-level education in Hungary until 1879. Without a national curriculum, as Fináczy (1896) stated the educators tried some "curriculum experiments" in 1860s, 1870s, and 1880s. *Journal of the National Association of Secondary School Teachers* was a venue allowing the authors to share their experiences and recommendations based on their in-class mathematics curriculum experiments. For example, in arithmetic, some authors shared their thoughts on content selection and distribution to improve mathematics education at the lower grades. Császár (1877c) and Suppán (1877) published their disagreements on how to introduce exponents and roots in the lower grades. While Császár suggested they should be presented with geometry, Suppán's opinion was to follow Herbart's idea to begin the study of exponents after ratio and proportion were taught. A decade later, Demeczky (1888) also addressed some modification in arithmetic curriculum by dividing the content into so-called "subject circles." The first subject circle should be calculation with whole numbers and integers, followed by a description of length, distance, mass, and volume. Other subject circles can include measuring money and time, calculating area by explaining the size of land, and applying basic operations to solve simple physics problems. Demeczky also emphasized the importance of applying the uniform metric system introduced at Treaty of the Metre in 1875.

While the recommendation of adjusting the arithmetic curriculum appeared only in a few articles, the lack of a national curriculum in geometry led to more discussions. Voicing his view regarding the general content of geometry curriculum, Császár (1876) claimed that secondary-level geometric education in Hungary began with the introduction of Entwurf (in the 1850s, Austria's "Organizationsentwurf" [Entwurf] was implemented in Hungary to regulate secondary education) in a peculiar way by using an inappropriate *Geometrische Anschauungslehre (Geometric Intuition)* handbook written by Mocnik. Császár argued that Mocnik's book started with a theoretical presentation of geometry and did not contain enough illustrations. Later, after reviewing and piloting several textbooks in his classes, Császár (1878c) recommended Ferenc Krisz's book for the lower classes for guidance on introducing geometry.

One particular area of the geometry curriculum discussed for several years between 1876 and 1880 was the necessity of teaching freehand drawing—which, according to some educators, was required for understanding natural sciences—in conjunction with geometry. In 1875, Trefort, the Minister of Religion and Education, ordered the compulsory teaching of geometry with freehand drawing as one subject in the gymnasia; however, several teachers harshly criticized this curriculum change in the journal. Landau (1876) strongly disagreed with combining geometry and drawing based on his 22 years of experience. He wrote that so-called geometric freehand drawing in such form was originally taught in 1850 in Hungary, as the brainchild of Austrian Nándor Heissig who was an assistant at the then-Vienna Polytechnic. The method was brought to the first Hungarian Real School of Pest in 1855 by German teachers who populated the institute at that time. After Landau piloted different German and French methods in his classes, he concluded that “it would therefore be desirable and very reasonable for the sake of our teaching if geometry and freehand drawing were taught separately and independently” (p. 300). Four years later, Suppán (1880) found that students still had a lack of conceptual understanding of geometric construction. Unlike Landau, he preferred to start teaching geometry via a construction with a ruler and a compass, then introduce freehand drawing afterwards. He applied methods from different educators such as Pestalozzi, Herbert, Mocnik, Falke, and Zizmannal in his geometry classes. Németh (1880) likewise emphasized the importance of teaching geometry in secondary schools, since not all students continued their education at higher institutions. According to Németh, the rapidly developing foreign industry would oppress Hungary if students lacked appropriate science education which required basic geometry skills. He agreed with the curriculum changes recommended a decade earlier by Education Minister Eötvös, who

> ordered the teaching of geometry and freehand drawing in our gymnasiums, not the proliferation of lessons, but the great importance of drawing, especially in the future, to develop the young person’s intellectual ability and sense of beauty, as well as the absolute necessity for science, art and industry. (p. 113)

As the discussions continued to be raised in the journal, Wohlráb (1881) criticized in detail the new geometry curriculum introduced in 1879 by referring to the history of geometry teaching in Germany, France, and Austria. According to Wohlráb, because geometry education in Hungary was lacking in excellent curricula and instruction, he recommended publishing new books to help teachers and students overcome this deficiency.

Interestingly, the topic of including statistics in mathematics education in high school was first mentioned in the mid-1870s. After attending at the 9th International Statistical Congress in Budapest, Weiss (1875) described that at the conference, Dr. Levasseur (Professor in France), Dr. Konek (Professor in Hungary), and Dr. Jahnson (Professor in Russia) shared their opinions of when and how to teach statistics. Levasseur from the Collège de France and Jahnson from St. Petersburg University stated while the basics of statistics could be taught with geography, statistics as an independent subject should be taught only in higher education. Konek, who did outstanding work in developing the general methodology of statistics in Hungary, disagreed, suggesting that the basics of statistics should be part of the curriculum as early as elementary and secondary schools so that students can develop a sense of duty towards correct statistical analyzes as soon as possible. Agreeing with Konek, Weiss suggested a greater role for statistics in Hungarian mathematics education. As a conclusion, Weiss recommended that statistical methods should be introduced in secondary education in Hungary, along with geography. He also emphasized introducing statistics as an independent subject at teacher training institutions so that future teachers can learn more about this topic.

After the preparation, discussion, and approval of the new curriculum for secondary schools in 1879, the Secondary School Law in 1883, passed by the Ministry of Religion and Public Education, established the structure for secondary schools. The Law also ordered two types of schools at the secondary level: gymnasia and real schools. Several authors were particularly opinionated about the new curriculum for real schools. For example, Ferenczy (1883) described the distribution of total weekly hours for all eight grades of mathematics in the new curriculum for real schools: 31 hours for mathematics, 22 hours for geometry between 1st and 8th grade, and 12 hours for freehand drawing as part of the geometry curriculum between

3rd and 8th grade. The new curriculum ordered arithmetic classes between 1st and 3rd grade, followed by algebra classes between 4th and 7th grade. The algebra material covered first- and second-degree equations, logarithms, trigonometry, sequences, binomial theorems, some third-degree equations, and series. In 8th grade, students would learn algebra with analytic geometry. Both Suppán (1882) and Mauritz (1883) agreed with the new curriculum, which emphasized that students having a solid foundation in mathematics and physics would be able to pursue successful careers in higher education. By contrast, Császár (1884) and Riedl (1884) recommended following the curriculum of Austrian real schools and referred to German textbooks. Szirtes (1884) also suggested that in the new curriculum, descriptive geometry should be chosen as a graduation subject for one of the maturity exams, as it was already used in the rest of the Monarchy.

By 1890s, the initiative of a unified high school was intensified by the Ministry of Religion and Public Education. Regarding the curriculum for unified high schools, *Journal* authors in 1890s discussed their opinions and made recommendations for mathematics curricular changes and content. For example, Beke (1891c) stated at the Association's mathematics subcommittee meeting in March that Hungarian mathematical education did not develop number sense in arithmetic or spatial approach in geometry. He suggested that in a unified high school, the arithmetic curriculum should be introduced through practical, real-life examples; the algebra content should be reduced and end with quadratic equations; and the geometry curriculum should focus on its relationship with algebra in greater detail. In order to implement new curriculum successfully, Beke also emphasized the importance of increasing teachers' content knowledge during teacher education. At the following mathematics subcommittee meeting in April, Hornischek (1891b) and, in the next year, Bozóky (1892) supported Beke's idea that descriptive geometry is an important subject in shaping spatial approach and recommended including it with algebra in mathematics education. Specifically, Bozóky strongly disagreed with Kőnig, the rector of Technical University, who had stated that teaching descriptive geometry was not appropriate in high school. According to Bozóky, geometry is an essential subject for understanding some concepts in physics, chemistry, geography, and other sciences. Czógler (1892) recommended incorporating principles of differential and infinitesimal calculus into the unified high school mathematics curriculum to acquaint students with basic problem solving in physics. The following years, Szontágh (1893) and Medveczky (1894) agreed with Czógler about increasing the relationship between mathematics and physics classes. They all recommended applying physics problems to mathematics lessons and, when possible, having the same teacher instruct both subjects. Medveczky also stated that the knowledge of novice teachers must be expanded with applications and experiments. At the end of the decade, Szirtes (1897) described the different geometry content and teaching methods he experienced while traveling in Saxony, Prussia, and Bavaria, where descriptive geometry was part of the maturity exam. Szirtes pointed out that German boys are more informed, independent, and mature thinkers than Hungarian boys of the same age. Like Császár and Riedl in 1884, Szirtes (1898) again recommended that geometry in Hungary should follow the Austrian and German curricula.

In conclusion, Hungarian mathematics education faced many challenges during the first 30 years of the Austro-Hungarian Monarchy. Without a national curriculum until 1879, authors who wrote in the *Journal* discussed curriculum experiments in the content areas of arithmetic, algebra, statistics, and geometry. Later, the importance of descriptive geometry and incorporating principles of differential and infinitesimal calculus into the mathematics curriculum to understand some concepts in natural sciences strengthened; this was aligned with the international reform movement for improving mathematics education at the turn of the 20th century.

5.2.1.2 Reform Movements. In the early 1900s, Hungary followed the International mathematics reform movement, initiated by David Eugene Smith (USA) and led by Felix Klein (Germany). The subjects of curriculum-related mathematics articles were narrowed down to Hungarian reform movements and the work of the Hungarian Mathematical Reform Subcommission in the *Journal*. In following the international reform movements, *Journal* authors focused on the curriculum and content changes being made in mathematics, with some introducing graphical methods and differential and integral calculus in high schools. For example, Mikola (1903) described the mathematics teaching reform movements in England led by John Perry and colleagues. Mikola stated that England previously lacked a unified curriculum, and students were compelled to take many rigorous written exams. As a result, formalism prevailed in mathematics education, killing students' natural interest in mathematics. According to reform movement ideas, mathematics should create higher stimuli, ingenuity, and independent thinking among students. Perry and colleagues encouraged the integration of graphic methods into instruction with the use of graph paper for visual learning. Following the English reform movements, Mikola stated that elements of differential and integral calculus should also be presented in relation to measurements in geometry and physics in Hungarian secondary schools. Similarly, Beke (1906) described the reform movements led by mathematician Klein in Germany; Czuber, a renowned professor at the Vienna Polytechnic, in Austria; and Moore, a professor at the University of Chicago in America. According to Beke, the essence of reform is to bring the material of mathematical education closer to modern social and economic life, and to expand the material in such a way that the basic mathematical forms of scientific thinking become more common in public consciousness. To this end, Beke agreed with Mikola, stating that the most important goal of modern mathematical teaching is to discuss the concept of function and the basics of differential and integral calculus. Several years after his 1903 article, Mikola (1909) recommended rearranging the curriculum between 1st and 8th grade by gradually building the concept of function. Mikola also mentioned that mathematics and natural sciences were introduced to be equivalent to the historical and linguistic sciences at the General Assembly of German Doctors and Naturalists in Meran in 1905. Like Mikola and Beke, Rátz (1912) later emphasized the importance of the reform and believed that "the basis and backbone of our mathematical teaching should be the notion of function, and that our high school teaching should no longer be without elements of infinitesimal calculation" (p. 250).

In 1908, to foster efforts to improve the quality of mathematics teaching and learning, the worldwide International Commission on Mathematical Instruction (ICMI) was founded. The main task of the Commission consisted of preparing national reports, with the purpose of forming national delegations (subcommissions). In the last years of the Austro-Hungarian Monarchy, the *Journal of the National Association of Secondary School Teachers* published articles on the results of the work of the Hungarian Subcommission. Visnya (1912) described the role and work of the national subcommittees of the International Commission on Mathematical Instruction. The subcommittees in England, Sweden, Netherlands, France, Switzerland, Japan, Austria, the United States, Germany, and Hungary had the major task of submitting a report on the current state of mathematics education for all school types in their own countries. The Hungarian material was edited and presented in German by Károly (Karl) Goldziher, a Hungarian mathematics professor, and Visnya, a high school mathematics teacher. At the 5th International Mathematical Congress in Cambridge, Visnya presented Klein's thoughts that if individual nations seek to benefit from international encouragement, education in their own countries must continue to be analyzed in detail. To collect information for the International Commission, the Hungarian Subcommission addressed 25 questions to secondary school mathematics teachers. In his article, Mikola (1912) analyzed the results. About half of the respondents were teachers from Budapest and half were from the countryside. Some stressed that the new curriculum should only set guidelines and give teachers the freedom to choose the quality and quantity of material based on the ability and developmental level of the class. The teachers also expressed that they needed appropriate and illustrative measuring tools for the mathematical laboratory and textbooks with statistical and economic examples. Several urged further professional development. Beke and Mikola (1913) in a jointly written article as well as Mikola (1913) in a separate piece summarized their experience of teaching differential and integral calculus in Hungarian high schools and presenting their results at the International Commission for the Teaching of Mathematics conference in Paris in 1912.

In conclusion, during the last two decades of the Austro-Hungarian Monarchy, the focus of the mathematics curriculum shifted toward the Hungarian reform movements, and later the work of the Hungarian Mathematical Reform Subcommission of the International Commission on Mathematical Instruction (ICMI).

5.2.1.3. Summary. During the Austro-Hungary Monarchy, 51 articles published in the *Journal of the National Association of Secondary School Teachers* discussed topics in mathematics curricula. The lack of a national curriculum after the Compromise of 1867 resulted in a weak mathematics education and the rejection of the outdated Hungarian maturity exam by many European countries. *Journal* authors' interest in educational issues particularly grew during this time, in key part as a form of curriculum reform. To improve mathematics education, teachers constantly looked to renew and create new curricula and conducted various “curriculum experiments” in regular mathematics classes, such as arithmetic and geometry, following the educational ideas of Pestalozzi, Herbart, and other. The authors even recommended expanding the curriculum with new branches of mathematics such as statistics, following the lead of French and Russian mathematics educators.

As the economy flourished, the new curriculum and law created in 1883 focused on natural sciences and mathematics. Establishing a solid foundation for students in mathematics and physics to pursue successful careers in higher education was emphasized, and a combination of the geometry and algebra curriculum was introduced. In the 19th century, international influences, especially those of the curriculum from Austria and textbooks from Germany, were clearly recorded in a range of articles published on the topic of mathematics curriculum development in the *Journal.*

As the new century began, attitudes revealed in published articles were slow to shift because of changes in the government, parliamentary struggles, and debates in professional groups. Moreover, the subjects of the articles were narrowed down to fewer content areas, mainly graphical methods and basics of differential and integral calculus, and ultimately shifting to the impact of international reform movements on Hungarian mathematics education. As a result of reform research, the Hungarian mathematics curriculum began to include functions as the backbone of mathematics teaching and elements of differential and integral calculus, given that these were considered to be key elements of other successful curricula.

5.2.2 Teaching Methods

Between 1868 and 1918, 65 mathematics-related articles in the *Journal of the National Association of Secondary School Teachers* raised various issues relating to teaching methods in mathematics and were typically authored by mathematics teachers. This comprised about 24% of the articles published during the first period of the *Journal*. This section presents general issues raised in the *Journal* related to teaching methods. Several articles described the course of the lesson taught, what was covered, and the activities conducted during the lesson. The main aim of these articles was to provide teachers with some successful didactic practices as well as to share ideas about how to teach certain topics. Some articles were specifically aimed at helping teachers with matters of fundamental importance such as how to teach the material, how to animate the lesson for the students, and how to increase student interest.

5.2.2.1 Terminology. During the Austro-Hungarian Monarchy, one of the key issues affecting mathematics teaching and learning was the lack of common Hungarian terminology. In 1844, a law was enacted making Hungarian the country's exclusive official language for government, education, and religion. After that, the Hungarian technical language of several sciences was formed, a process which lasted throughout the 19th century. The language of mathematics was no exception. The lack of a unified technical terminology made it extremely difficult for specialists, including teachers, to communicate with each other. That is why the development of the Hungarian language of mathematics was indispensable. In articles published in the *Journal*, many authors made recommendations to implement the same vocabulary in arithmetic, geometry, and algebra. For example, Ábel (1872b) stated that "we use several different, often substantially different terms to denote any number of quantitative concepts" (p. 493). He supported his argument by providing samples (for example, a different version of the word *proportion*, such as *symmetric*) that described the same concept with different Hungarian mathematical terms. Moreover, according to Ábel, the students may become confused when they have different teachers over the years. In his article, Mauritz (1873) wrote that "my aim was to bring a certain uniformity into our teaching, because there is no doubt that in this way, we will facilitate the work of our students who are forced to change schools" (p. 306). Császár (1877b), Wohlráb (1877), Szecsődy (1877), Horváth (1877), and Brassai (1878) provided recommendations for common arithmetic terms. They all agreed with Horváth's (1877) statement that "the language of all sciences should be reformed by the professionals themselves; …linguistics can and will help them in this endeavor; but it is up to the professionals to start and manage the work" (p. 306). Császár (1878d) and Suppán (1878) suggested how to translate Latin, German, and French geometric terms into Hungarian. Even two decades later, Mendlik (1896) and Brassai (1896) recommended examples from algebra to serve as common Hungarian mathematical terminology (e.g., which common Hungarian terminology to use when discussing the area of a right triangle). Both agreed that it was important for students to learn correct, precise, professional Hungarian mathematical language. Years later, in the early 1900s, however, the common professional language would still prove to be a challenge in mathematics teaching and learning. Barcsa (1903) pointed out that because 20-25% of students changed schools during their high school years, a unified set of Hungarian grammatical and mathematical terms was required. According to Barcsa, this issue can only be solved by adapting unified conceptions and vocabulary in textbooks, which in turn can also guide teachers.

5.2.2.2 Instructional Practices. The section below describes some noteworthy or interesting instructional practices in arithmetic, algebra, trigonometry, and geometry introduced in the *Journal of the National Association of Secondary School Teachers* between 1868 and 1918. The main aim of these articles was to provide teachers with some successful practices about what and how to teach certain topics.

In the first three decades of the *Journal*, several authors introduced their arithmetic lessons to increase students' interest in mathematics. For example, Ponori Thewrewk (1868) described his method to teach conversion using examples from the Austrian and old Roman financial and weighing system. Domokos (1871) introduced a lesson to teach his students to calculate cube root manually. Lewin (1875) shared his lecture on the arithmetic series and the Pascal triangle. At a committee meeting, Wohlráb (1875) presented a number theory game, which Cantor described in Schlömilch's September booklet *Zeitschrift für Mathematik und Physik*. (*Journal of Mathematics and Physics*) This game was based on a book entitled *Die Wunder der Rechenkunsfc* (The Miracles of Arithmetic), published in Weimarin in 1842. According to Wohlráb, the oldest version of the game had been presented in 1612. Four years later, Wohlráb (1879) introduced his lesson to teach ratio and proportion starting with basic examples, then concluded the formula for speed. He also described how to apply direct and inverse variation to find formulas for simple interest and some area- and work-related problems. More than a decade later, Mendlik (1892a, 1892b) described his instructional practices with whole numbers and decimals and provided three examples to introduce simple interest. One of his examples was the following: "Someone commits to paying HUF 732 with the five-monthly 4% interest in five months, and HUF 618 with the nine-monthly 4% interest in nine months. The creditor agrees that the entire amount of HUF 732 + 618 = HUF 1,350 will be paid at once. How long does it take for this to happen?" (Mendlik, 1892b, p. 659).

A number of authors also shared some instructional practices in their algebra classes with their colleagues. For example, Császár (1875) described how he used examples from two popular Hungarian logarithm books written by Lutter and Bajusz to solve problems in surveying with the Gaussian logarithms table from Wittstein's book published in Hannover in 1866. One example he described in detail was how to find the distance between Paris and Budapest on a globe. Walla (1879) outlined the steps of mathematical induction, which he strongly believed would help the understanding of mathematical logic. He described examples from the book titled *Lehrbuch der Arithmetik und Algebra* (*Textbook of Arithmetic and Algebra*) written by Schröder and recommended studying Dirichlet's works because his work is the most thorough in the field of logical methodology. Finally, Wohlráb (1886) shared his lesson on quadratic equations with complex number solutions in 7th grade.

Some articles in the *Journal* introduced lessons from trigonometry classes over the decades. Mayer (1873) started his lessons by introducing basic definitions, then following with the application of trigonometric tables. A decade later, Szutrély (1883) described that the 1883 high school curriculum had reduced the number of mathematics classes, so certain parts needed to be discussed with new, simplified methods. He shared how he introduced trigonometric values from similar triangles and emphasized the importance of regular practice. Later, Beke (1891a) shared his lesson on how to calculate the perimeter of the circle with trigonometry. After the turn of the century, Faragó (1905) and Szőke (1905) suggested deriving the concepts of sine, cosine, and tangent from a right triangle using the Pythagorean theorem. Szőke shared his lesson with a detailed description for first solving the right triangle and then moving on to real-life examples; finally, he extended the study to include isosceles triangles and regular polygons. Starting with this method, he obtained Heron's formula.

Sample lessons teaching geometry were also published throughout this period in the *Journal*. Suppán (1879a, 1879b) showed one lesson on determining the plane section of radial surfaces and another on defining the axes of the circular shadow. His articles contained excellent constructions and drawings (Figure 5.4). Szirtes (1881) described a problem-solving lesson on second-degree graphs. Wohlráb (1882a) shared his lesson to determine the perimeter of a circle. Beke (1883) believed that applying algebra to geometry, and even merging the two together, is very important in high school. To illustrate, he described a lesson on how to derive the equation of an ellipse, a hyperbola, and a parabola with coordinate transformation. Kiss (1885) presented his lesson for presenting stereographic projection in the 8th grade (Figure 5.5).

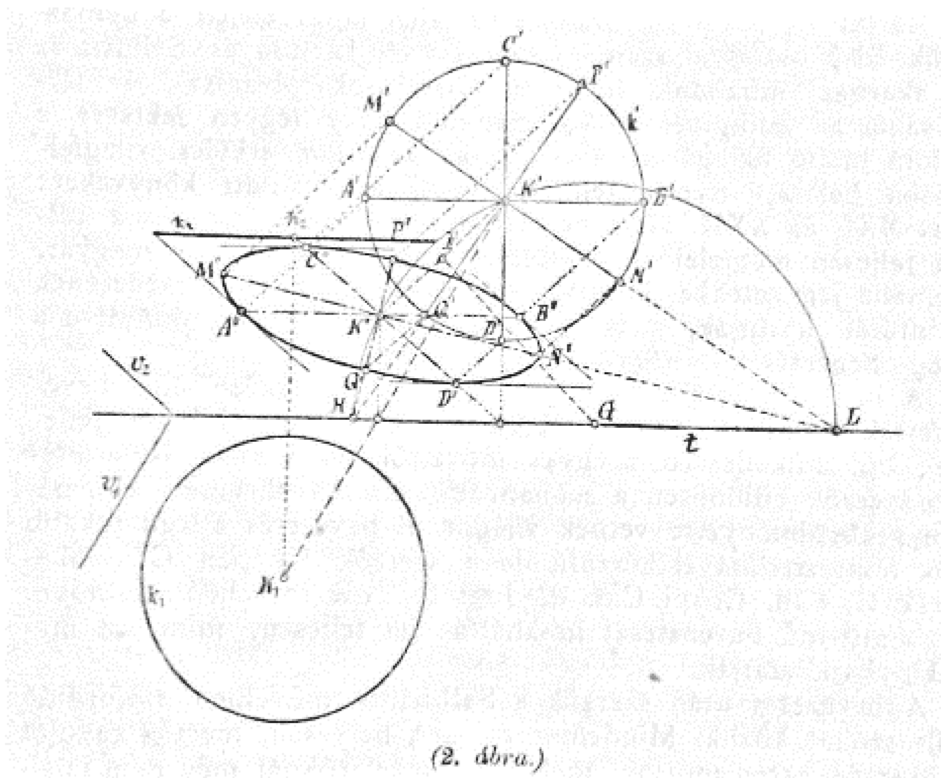

Figure 5.4: A Construction Example in Suppán's (1879a) Lesson

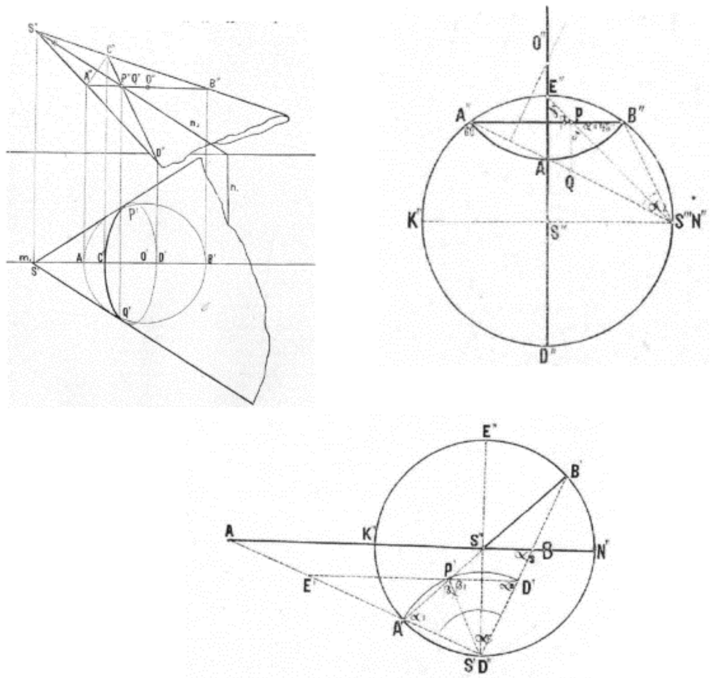

Figure 5.5: Example for a Stereographic Projection in Kiss's (1885) Lesson

5.2.2.3 General Teaching Methods. In addition to introducing a specific lesson, several authors shared their teaching techniques to improve students' active involvement in mathematics classes. The main aim of these articles was to help teachers with matters of fundamental importance such as how to teach the material, how to animate the lesson for the students, and how to increase student interest. For example, Császár (1873) expressed his teaching philosophy that students must always be able to account for their own learning. Instead of direct instruction, however, his lessons started with guided discussions of interesting examples, allowing the students to make a conclusion together and finally generalize the formula. Császár also believed that by discussing problems aloud, the students' mental counting would be improved. Heller (1877) similarly provided examples of class discussion in his physics labs, where students were able to discover mathematical relationships to the physics problems. In his lesson, Demeczky (1889) applied student-led discussions to find a general formula for compound interest at the practicing gymnasium of the Teacher Training Institute in Jena where he studied education. Demeczky practiced the method he learned from Dr. Rein, a university professor in Jena, and Dr. Pickel in Eisenach.

Other articles also described some techniques of classroom management that teachers could adopt. For example, Szekeres (1884) required each student to have two booklets, one for school and one for home. Each school booklet was divided into two parts, with theorems or examples always on the left and the necessary solutions on the right. Szekeres also checked students' understanding of previously learned material by questioning them on it at the beginning of every class. Students were expected to solve problems mentally in their head. Beke (1887b) also required students to divide their notebooks into two parts, with their own work on one side and corrections demonstrated on the other side. Problems were to be answered fully with step-by-step written explanations.

5.2.2.4 Teaching and Learning with Real-life, Hands-on Activities. The new curriculum for secondary school in 1879 represented one of the major principles of Mór (Maurice) Kármán's pedagogy that placed emphasis on self-activity in instruction. During the preparation, discussion, adoption, and impact of the curriculum, the importance of real-life, hands-on activities for use in mathematics classes was presented in many articles during this period.

In the 1870s, Porszász (1874), Ábel (1874b), and Kreybig (1874) described how they adopted Falke's method in geometry. Falke took his students on field trips to show the application of geometry to real life, then taught the theories behind the application in the classroom. His method was introduced in *Propädeutik der Geometrie (Propaedeutics of Geometry)* in 1866. Even though Porszász, Ábel, and Kreybig agreed with the concept, they stated that organizing field trips with 600-700 students was challenging. However, the positive contribution of this method—combining theory with real life—was in how it increased student interest in the subject matter. All three authors recommended including modifications to Falke's methods in geometry classes in Hungary.

During the next decade, the 1880s, the idea of hands-on learning in mathematics classes was revisited in the *Journal*. Suppán (1882) strongly believed in introducing mathematics with real-life examples in the lower grades; he cited German and French methods to introduce decimals by measuring length via the newly adopted metric system. Baló (1883) described his student-led instruction to introduce irrational numbers; he showed an example of how to calculate $\sqrt{2}$ geometrically by measurement. Schmidt (1890) described his hands-on activities to practice basic arithmetic operations. First, students would measure different objects and write up their steps in a notebook, then describe their measuring methods verbally. Through this combination written-verbal learning activity, Schmidt found that students developed deeper understanding of the material.

More than 10 years later, Mikola (1902) described a reformed teaching method, adopted in Hungary following Herbart's idea which strongly encouraged hands-on experience. As Mikola stated, "Arithmetic is primarily and mainly a practical science, the only high school subject whose practical benefits are tangible.... Especially a small nation like us has to take this well. In the current and then intensifying economic struggles, only those nations can stand out who equip their sons with useful weapons of practical knowledge" (p. 494). Mikola recommended starting arithmetic classes with measuring length, volumes, area, weights, and time. László (1902) agreed with Mikola, emphasizing the importance of conceptual understanding through real-life examples and hands-on activities.

Following Mikola, Goldziher recommended adapting real-life experiences in mathematics classes in several articles. One of his suggestions was to teach arithmetic with real-life examples from geography. Goldziher (1905) provided examples that analyzed statistics of both the city of Budapest and the whole country of Hungary with current geographical data from publications of the National Statistical Office. Another suggestion for hands-on teaching in mathematics was described through Goldziher's (1907a) mathematics "laboratory method." Based on ideas from Moore in the United States and Perry in England, Goldziher recommended this type of laboratory in Hungary as follows: (1) exercises should be present from the lowest grade onwards; (2) mathematical laboratories should use all the tools needed to teach different measurements; (3) arithmetic teaching should be used in the laboratory to perform statistical analyzes; (4) for higher education, independent mechanical, physical, chemical, meteorological, astronomical, and geotechnical measurements should be performed to practice calculations; (5) the editing of accurate graphs in the laboratory should be greatly improved; and (6) practical mathematical literature should be used to a greater extent in teacher libraries. Goldziher (1907b) also emphasized the importance of graphic methods in lower-level mathematics classes because they can prepare students for the concept of function later.

5.2.2.5 Summary. Between 1868 and 1918, slightly more (5%) articles in *Journal of the National Association of Secondary School Teachers* discussed topics regarding mathematics teaching and learning methods than they did regarding curriculum. After the Compromise in 1867, one major issue that surfaced was the lack of Hungarian as a professional language to discuss mathematics. The economic advances that occurred under the Austro-Hungarian Monarchy required precise technical vocabulary to support professional communication and understanding in the modern world. Because the language lacked a unified mathematical terminology, a number of articles recommended ways to implement the standard vocabulary in arithmetic, geometry, and algebra. Despite some improvement in this regard, this issue was still of concern at the onset of the 20th century.

Another major issue evident through the *Journal* articles during this time period was the lack of a national curriculum and instructional method. Teachers tried various instructional methods published in German books and shared their experiences with them in the *Journal*. The urge to increase students' interest in mathematics eventually resulted in adopting new student-centered teaching methods that echoed the ideas of Herbart and Falke. The importance of real-life experiences and their application to mathematics education was initiated early on in the *Journal*'s publication.

From the second half of the 1880s to the early 20th century, the focus of the articles shifted to didactic issues and the need to reform teaching methods. Student-led instruction from Germany and the "laboratory method" from England and the United States were introduced in Hungarian high schools. Following international reform movements, the importance of conceptual understanding through real-life examples and hands-on activities in mathematics classes clearly intensified, as revealed by their prevalence in the *Journal* articles at this time.

5.2.3 Book Reviews

The *Journal of the National Association of Secondary School Teachers* contained a section for reviews of Hungarian and foreign mathematics journals and textbooks. The main aim of these reviews was to introduce teachers to existing Hungarian and foreign mathematics literature, particularly to show how these textbooks and journals presented their material. These reviews also helped teachers become familiar with different methods of teaching specific topics. Between 1868 and 1918, 51% (134 out of 263) of mathematics-related articles were in this section of the journal. The distribution of the number of Hungarian and foreign book and journal reviews can be found in Table 5.2.

Table 5.2: Distribution of Mathematics Book/Journal Reviews in *Journal of the National Association of Secondary School Teachers* Between 1868 and 1918 by Type

Type of Book/Journal Reviews	# of Articles
Hungarian Book Review	98
Hungarian Journal Review	1
Foreign Book Review	31
Foreign Journal Review	4
Total	**134**

A total of 73% (98 out of 134) of the published articles introduced Hungarian mathematics textbooks or journals between 1868 and 1918. This section provides a discussion of some of them by subcategory (arithmetic, algebra, geometry) and, interestingly, describes what proved to be some heated discussion between authors and reviewers. The remaining almost-quarter (24%) of the articles introduced foreign textbooks and journals, some of which are briefly showcased below.

5.2.3.1 Hungarian Book Reviews. In the late 1860s and 1870s, the Ministry of Religion and Public Education financially supported the *Journal* and required it to review newly published Hungarian textbooks. The new arithmetic and algebra books were reviewed by Mauritz (1871), Ábel (1871, 1875a), Mendlik (1871), Fridrik (1871), Reif (1875), Éberling (1875, 1877), and Császár (1877a, 1879a, 1879b). New high school mathematics textbooks with real-life examples from geography were reviewed by Heinrich (1870) and Wiederman (1871), while new geometry textbooks were reviewed by Mayer (1868), Schröder (1869, 1877), Császár (1874, 1878b, 1879a), and Czehe (1879).

In 1870, one of the reviewers Ábel and author Bajusz held a heated discussion about Bajusz's new geometry textbook titled *On Three Spatial Axioms*. To alleviate the lack of

Hungarian textbooks, an attempt was made to process each chapter of mathematics in an independent short book; such was the geometry book by Bajusz. When he introduced his own book, Bajusz (1870) stated that he had learned the new ideas and techniques from Fiedler, whose book was a German translation of the original English book written by Salmon. The first reviewer, Mauritz (1870), positively commented on Bajusz's textbook. By contrast, however, Ábel (1870a), who also published his own geometry book in 1867, harshly criticized Bajusz's book. They disagreed with each other on which German and French books were understandable to Hungarian high school students. In their argumentation, they analyzed selected works by Rudolf Wolf (Switzerland), Adrien-Marie Legendre (France), Richard Beez (Germany), and J. H. T. Müller (Germany) as a way to show what was or was not understandable to Hungarian high school students. While Bajusz's books did not become popular, nor did the method of covering each chapter in a separate booklet, Ábel's geometry books were used even into the early 1920s (with several revisions).

In the same year, another heated discussion was published between reviewer Brassai and author Schröder regarding Schröder's geometry book titled *A Guiding Thread in the Teaching of Geometric Freehand Drawing*. Although Brassai (1870) and Schröder (1870) agreed that one of the most neglected subjects in real schools was geometry with freehand drawing, Brassai (the older polymath) and Schröder (the younger architect) vigorously disagreed on how to introduce and teach it in secondary schools. They even had different opinions about the definition of freehand drawing. According to Brassai, teaching drawing in geometry should start with a ruler and compass; then, after proper practice, the student could continue by freehand. Brassai referred to the teaching method of the Swiss mathematician Wolf, which had already been mentioned in an earlier discussion between Ábel and Bajusz. By contrast, Schröder stated that the purpose of geometric freehand drawing was to acquaint students with perspective; he followed the methods of Mocnik and Heisig. The responses between Brassai and Schröder were clearly very personal, hurtful, and derogatory. For example, Brassai noted disapprovingly that Schröder attributed length, width, and thickness to the point made with chalk. Most likely, Schröder's ego was hurt so his answer was "I don't want to ask Mr. Judging that he doesn't consider a dot made with chalk to be a body. Or has he not had the opportunity to present a lesson to 10-12-year-old boys, so he doesn't know that such things should be said to the students?" (Schröder, 1870, p. 583).

A decade later, in 1880, the *Journal* also published a sharp debate between reviewer Lutter (1880) and author Kőnig (1880) regarding Kőnig's book, *Algebra for the Upper Classes of Secondary Schools According to the New Gymnasium Curriculum*. Kőnig, a professor at Technical University, and Lutter were involved in the preparation of the new curriculum in 1879. Both were proponents of the genetic method, which prioritizes student thinking instead of information provided by the teacher, but their ideas about its adoption in education differed. Lutter stated that while the content of Kőnig's book is correct, the descriptions were not efficient for high school students. He also wrote that because Kőnig never taught at the secondary level, his book reflected that lack of expertise and experience. In reflecting on Lutter's criticism, Kőnig stated that he followed the recommendation of a committee of which Lutter was a part but had remained silent. Thus, Kőnig felt that Lutter was unfair, and the harshness of the article startled him. Kőnig deftly countered all of Lutter's comments. Despite Lutter's criticism, Kőnig's mathematics book, written with exemplary professional care, showed a new way of thinking. With his book, a new era began in the series of Hungarian high school algebra books.

Two years later, another debate between author Suppán and reviewer Wohlráb was published regarding Suppán's textbook titled *Arithmetic*. Wohlráb (1882b) did not consider the book suitable for high school use because of many pedagogical, didactic, methodological, and numerical errors. He supported his opinion with a number of examples in his 32-page analysis. Suppán (1883) reacted to Wohlráb's article by defending his book with many counterexamples. Suppán claimed that he wrote his book on the order of the National Board of Public Education, and it was licensed by the Ministry to gymnasia and real schools. Interestingly, Suppán referred to Wohlráb's points and arguments but never mentioned him by name in his response. Despite Wohlráb's criticism, Suppán's book became very popular and was reprinted in additional editions. Both Beke (1887c) and Gúta (1892) reviewed some of the later editions of Suppán's book. Beke expressed his absolute positive opinion as follows: "The spirit of high school instruction does not prevail as much in an arithmetic book as in Suppán's. There is hardly an idea in this rich repository of instructions that the author would not have sought to achieve" (p. 242).

In the 1880s, 1890s, and early 1900s, several more Hungarian mathematics textbook reviews were published in the *Journal*. Newly published arithmetic and algebra books with commercial examples were reviewed by Wagner (1885), Bogyó (1888, 1890), Balogh (1892), and Schmidt (1895). New geometry textbooks were reviewed by Hornischek (1891a, 1892), Demeczky (1892), Bozóky (1896), and Szirtes (1901, 1910).

In 1891, the Mathematical and Physical Society was founded and elected Loránd Eötvös as president, Gyula Kőnig as vice-president, and Gusztáv Rados as secretary. In 1894, Dániel Arany started *The Mathematics Journal for Secondary Schools* to support student preparation for future national and international mathematics competitions. Books with problem collections written by Rátz, one of the preparatory teachers for mathematics competitions, were reviewed by László (1903) and Goldziher (1904).

Books focusing on reforms in mathematics teaching, analysis, and differential and integral calculus were reviewed by Beke (1885, 1887a), Mikola (1908), Habán (1909), and Rados (1910). During the first period of the journal between 1868 and 1918, the last published article was a book review by Goldziher (1917) regarding trigonometric tables.

5.2.3.2 Hungarian Journal Reviews. The *Journal of the National Association of Secondary School Teachers* introduced only one Hungarian journal, *Journal of Mathematics and Physics*, for which Beke (1891b) described its foundation. He pointed out that high school teachers and mathematics professors such as Jenő Hunyady, Gyula Kőnig, Kálmán Szily, Gusztáv Rados, and Loránd Eötvös had been attending regular meetings and giving professional lectures since 1885 in Budapest. The aim of the new journal was to publish these presentations and describe mathematics and physics to general audiences. The presentations in the new journal discussed only the content of these subjects, not the methodology of their teaching.

5.2.3.3 Foreign Book and Journal Reviews. About a quarter of the articles introduced foreign textbooks and journals in the review columns of the *Journal of the National Association of Secondary School Teachers*. Ábel (1869, 1870b) reviewed the first and second volumes of a German journal titled *Zeitschrift für mathematischen und naturwissenschaftlichen Untericht*. (*Journal for Mathematics and Science Education*), edited by Hoffman. He introduced the structure of this journal; some geometry articles written by Oppel and Kobel; and some books written by Snell, Schlomilcs, and Baltzer. Ábel (1872a) also reviewed Bardey's German textbook titled *Methodisch geordnete Aufgabensammlung (Methodically Arranged Collection of Exercises)*, published in Leipzig in 1871. The book contains 40 chapters with 1,000 equations from science, geology, geometry, and statistics. Ábel commended the book because its prolific examples would ensure that the book could be used for years without repetition. Ábel's only suggestion was to include the solutions in the book.

Ábel (1874a) and Császár (1878a) reviewed foreign textbooks regarding determinants. Ábel found more literature in German than in English. The books that Ábel reviewed were *Die Determinanten (The Determinants)* by Dr. Hesse, published in 1872; *Einleitung in d. Theorie d. Determinanten (Introduction to the Theory of Determinants for Students at Secondary Schools and Technical Institutions)* by Dr. Studnicka, published in Prague in 1871; *Introduction to the Doctrine of Determinants* by Hattendor, published in Hanover in 1874; *Determinants and Their Application to the Solution of Algebraic and Analytical-Geometric Tasks* by Dr. Dölp, published in Darmstadt in 1874; and *Preschool of the Theory of Determinants for Grammar Schools and Secondary Schools* by Dr. Reidt, published in Leipzig in 1874. Ábel's (1874a) opinion was that "the works of Reidt and Dölp are the most suitable for beginners, followed by Hattendorf's core work and finally Hesse's "wide-ranging material" (p. 234). Császár (1878a) reviewed *Introduction to the Theory of Determinants,* written by Bartl and published in Prague in 1878. He stated that if Hungary wished to be at the forefront of teaching mathematics, teachers must follow the curriculum of German real gymnasia, which had been teaching determinants already for 10 years. Császár recommended Bartl's book because of its descriptions of determinants and examples.

Mauritz (1872) reviewed Dr. Frischauf's book titled *Textbook of General Arithmeticé Introduction to Analytical Geometry, Elements of Geometry, The Geometrical Constructions*, written in Graz, Austria in 1869. Mauritz stated that even though the arithmetic part of the book does not include examples, the section on geometry combined with trigonometry contained 62 pages in and of itself, with many practice exercises.

Wohlráb (1878) reviewed *Mathematical Problems Compiled for the Upper Grades of Secondary Schools* by H. C. E. Martus. After the 3rd edition, the book was translated from German into Hungarian by Dr. Császár and published in Budapest in 1878. As a collection of final examination assignments in the Prussian gymnasia, Wohlráb suggested that in the Hungarian version, the names of worldwide cities in the problems could be changed specifically to Hungarian cities to be more relevant.

Schmidt (1883) reviewed the Močnik-Klamarik-Wagner book entitled *Geometry for the Upper Grades of Secondary Schools*. This 3rd edition was published in Budapest in 1883. Without taking any position, Schmidt stated that this mathematical textbook had been used for more than three decades during the Austro-Hungarian Monarchy and was still aligned with the current Hungarian curriculum.

5.2.3.4 Summary. Between 1868 and 1918, more than half (51%) of mathematics-related articles were published in the section devoted to "Book and Journal Descriptions/Reviews" in the *Journal*. Permission for publishing textbooks had been granted by the State in the 1850s, originating with the *Organizationsentwurf*. This system was taken over in 1868 by the Ministry of Religion and Public Education. For almost a quarter of a century, the task of reviewing textbooks was done by the National Council of Education.

During its first decade, the Ministry financially supported the publication of the *Journal of the National Association of Secondary School Teachers* and, in return, required it to review newly published textbooks for the National Council. A surprisingly large number of new mathematics textbooks in fact characterized the early years of the journal, mainly because the national curriculum was disorganized and not unified, and the publication of textbooks was proving financially and professionally beneficial. Despite the extensive variety of textbooks, only a few were considered outstanding and widely used in high schools. In addition to the standard textbooks by Mocnik and Lutter, new ones by Ábel, Császár, Mauritz, and Suppán were widely adopted. While the main aim of the book reviews in the *Journal* was to introduce teachers to existing mathematics literature, the new ideas described in the textbooks often provoked sharp debates between reviewers and authors. For example, one major controversy focused on the geometry curriculum. The economic boom from industrialization required deeper mathematical knowledge, which resulted in compulsory drawing education (freehand and constructive) in the geometry curriculum in 1871. Authors disagreed on which international (German, French, Swiss) books and methods should be adopted in these new geometry classes. The other major debates in the *Journal* were around the choice of arithmetic and algebra topics in the 1880s, especially which pedagogical, didactic, and methodological practices are suitable for secondary-level instruction. While the rigid, dogmatic method can be observed in Mocnik's books, the new authors argued how to adopt the genetic method.

The Secondary School Law in 1883 by the Ministry of Religion and Public Education established a controlling role of the state in all secondary schools—not only public schools but also religious schools. Approval of the curriculum was the right of the Ministry, and thus only textbooks approved by the Minister could be used in every secondary school. This firm control decreased the number of new mathematics textbooks, which then implied fewer reviews of arithmetic, algebra, and geometry textbooks in the *Journal*. At the end of the 19th century and the beginning of the 20th century, reforms of mathematics teaching in Hungary were being introduced; thus, the focus of reviews shifted to higher-level mathematics content such as analysis and differential and integral calculus.

From the late-1880s, Eötvös, with his German educational background from Heidelberg and Kőnigsberg, placed special emphasis on the achievement of secondary school students in regular national interschool competitions for mathematics and the sciences. To support student preparation, *The Mathematics Journal for Secondary Schools* was published in Hungary in 1894 and contained a wide variety of problems from different branches in mathematics. Thus, authors of articles in the *Journal of the National Association of Secondary School Teachers* began to introduce books with problems from *The Mathematics Journal for Secondary Schools* devoted to mathematics competitions.

Between 1868 and 1918, the international impact on mathematics education can be observed in the *Journal of the National Association of Secondary School Teachers*. A significant number of German journals and textbooks were reviewed to help teachers become familiar with different trends in mathematics teaching and learning. In addition to German literature, a few books published in Prague were also reviewed. Cumulatively, 13% of the articles in the *Journal* discussed foreign mathematics curricula and teaching methods during that era.

5.3 1918-1944: Hungarian Republic, Then Hungarian Kingdom Without a King

After Hungary was defeated at the end of World War I in 1918, the country was governed by short-lived leftist governments until 1920. By the time the Treaty of Trianon was signed in 1920, formally ending World War I, Hungary lost 70% of its land and about two-thirds of its population. These political and social changes substantially affected the new country's educational system. Kornis (1932), the Secretary of State for Religion and Public Education under Klebelsberg's ministry, stated that the 256 secondary institutions (gymnasia and real schools) in 1917 had decreased to 156 by 1924. While the National Association of Secondary School Teachers tried to adjust to the different circumstances, its *Journal* continued to exist, but with significantly fewer pages and articles. The articles mainly talked about the general situation of education and the preparations and effect of new education laws; subject-specific articles did not appear until the mid-1920s. The first article regarding mathematics education was a book review by Goldziher in 1924. During this second era, between 1918 and 1944, the total number of mathematics-related articles decreased from 263 in the previous era to only 27 (about 10% of the total articles) in the *Journal*. Of the total 27 articles regarding mathematics education, 26% discussed issues of curriculum, 11% introduced recommendations for teaching methods, and 59% were book/journal reviews (see Table 5.1).

5.3.1 Curriculum

After World War I, articles in the *Journal of the National Association of Secondary School Teachers* pointed out the positive and negative characteristics of the mathematics curriculum during this time. This section summarizes six specific articles on Hungarian curriculum and foreign trends regarding mathematics education in this era.

The 1924 Law, a revision to the Secondary School Law of 1883, introduced a new type of secondary school between the gymnasium and the real school: the “real-gymnasium.” In the *Journal*, authors revisited the idea by the Hungarian Mathematical Reform Subcommission from the beginning of the 20th century to include higher-level mathematics (analysis and differential and integral calculus) in the new curriculum in order to improve mathematical and scientific thinking. For example, Sárközy (1925) suggested that “the elements of vector calculus are so simple that they can even get into the material of high school teaching” (p. 320). He supported his argument by describing the works of Cantor (written in 1872) as well as Hilbert, Zermelon, and Perron regarding set theory. He also introduced basic vector calculus by presenting the work of Leibniz, Möbius, Hamilton, Grassmann, and Riemann. A decade later, Tóth (1934) also recommended including infinitesimal calculus in mathematics teaching in all secondary schools, even in girls' schools. As he stated, in a truncated Hungary, the new mathematics curriculum introduced in 1926 interpreted instructions in divergent ways. Because many parents themselves had not learned the basics of integration and differential calculus previously, Tóth considered it important to bring this curriculum change to public awareness. Specifically, the general public should understand how the teaching of differential and integral calculus was essential for both functional thinking and scientific thinking. Nine years later, Tóth (1943) wrote about the current situation of mathematics education. Tóth described how the history of teaching calculus in Hungary started with Farkas Bolyai, who had proposed introducing the concept of function and graphical methods as long ago as 1834. Trefort's curriculum in 1879 and Wlassics's curriculum in 1899 already included graphical representations of quadratic and rational functions. In 1902, following Klein's reform movement in Hungary, teaching infinitesimal calculations was initiated in secondary schools. Klebelsberg's curriculum of 1924 also emphasized the importance of graphic representations in greater detail. In short, Tóth praised the work done in Lutheran High School in Budapest under the mathematics leadership of Rátz and the scientific leadership of Mikola. Based on his experience of spending thousands of hours in mathematics classes since 1928, Tóth stated that the greatest shortcoming of Hungarian secondary mathematics education was how problem-solving activity had declined over the last 15 years. Another problem was that students coming to a teacher training university arrived with limited content knowledge. Tóth wrote his article with the firm belief that the situation would change in favor of improving education.

The 1934 Secondary School Law abolished real gymnasia and real schools and introduced the unified high school. The motive of the Law was to strive for a unified worldview and ensure the development of higher education. The new curriculum in 1938, following the 1934 Law, devoted more space to so-called national subjects (such as the Hungarian language, Hungarian literature and art, Hungarian history, and Hungary's geography and ethnography) and reduced the number of hours devoted to Greek, Latin, mathematics, and the sciences. In his article, Gyarmathy (1941) wrote about the geometry education in the new gymnasium. By the end of the 1940-41 school year, the last real school class closed and gave way to a unified high school, where descriptive geometry was no longer mandatory. Gyarmathy emphasized the importance of geometry to develop students' spatial skills. He also highlighted the pedagogical value of the subject, which requires accuracy, conscientiousness, and independence. Geometric theorems develop logical thinking and provide valuable knowledge for technical careers. According to Gyarmathy, Hungary cannot afford to neglect geometry because it plays an important role in renewing the life of a nation that has lost much.

In addition to investigating and analyzing the Hungarian curriculum, two articles presented foreign trends in mathematics education in the *Journal*. First, Loczka (1928) introduced major subjects from American high schools, indicating that in American high schools, students do experiments in science classes, which helps in "teaching mathematics to develop the ability to properly understand spatial and quantitative relations" (p. 360). Second, Jelitai (1936a) wrote about the International Congress of Mathematicians in Oslo in July of 1936. Countries presented their reports on their mathematics education between 1932 and 1936. These reports varied in length and content, but there was a general agreement that worldwide psychological and methodological issues were becoming increasingly important to write into new curricula. The Congress welcomed 500 mathematicians, including 12 Hungarians; most of the lectures were in German. Jelitai stated that the truncated state of Hungary was represented by lectures given by Pál Erdős (number theory), József Jelitai (history of mathematics), Béla Kerékjártó (geometry and topology), and Rózsa Péter (mathematical logic). David Eugene Smith, a professor at Teachers College, Columbia University in New York, also attended the Congress. Jelitai considered it important to apply the results of the work done at the Congress to modifications related to the Hungarian mathematics curriculum.

5.3.2 Teaching Methods

Between 1918 and 1944, only three articles focused on mathematics teaching and learning methods. Two introduced professional development for teachers, and one described a teaching aid.

The new curriculum in 1926, following the 1924 Law, listed the mathematics requirements for secondary schools in greater detail. The objectives of the mathematics curriculum included emphasis on the concept of function. Few textbooks were published for the 1926 curriculum because, on one hand, the economic situation was very challenging, and on the other hand, the government considered several previous textbook writers undesirable. For example, Beke was already among those not permitted in 1925 to write textbooks because of his left-wing political actions between 1918 and 1920. Since learning many new materials while lacking textbooks required much work from teachers, the government organized regular methodological and professional training. Kornis (1934) and Manger (1934) wrote articles about a training course for in-service teachers organized by the National High School Teacher Training Institute in Budapest in 1934. Kornis stated that the course was designed to (1) introduce the latest advances in each branch of mathematics, and (2) show what and how they can be applied to secondary education. Kornis stated that after the reform movements in the early 1900s led by Beke, Mikola, Goldziher, and Rátz, the 1934 high school curriculum began to introduce elements of infinitesimal calculus. Both Kornis and Manger listed the well-known mathematicians who presented the current research in mathematics and mathematics education, such as Gyula Kornis, Géza Tóth, Pál Veress, Lipót Fejér, Béla Kerékjártó, István Grynaeus, Gusztáv Rados, and Dénes Kőnig. During the course, the attendees visited the model collection and library of the Royal Hungarian József Technical University (led by university professor Rados) as well as a real school in Gödöllő.

Years later, Bukovszky (1942) described another training course for high school mathematics teachers. He stated that after an 8-year break since the last training course in 1934, 112 participants gathered in Budapest. The course provided participants with a way to live in a scientific atmosphere for 3 weeks, freed from everyday work and their usual environment. As Bukovszky described it, the organizers of the course indicated that the lectures served a dual purpose: (1) they presented different branches of mathematics and science, and (2) they discussed important issues of the didactic nature of mathematics teaching. During the training course, 15 lecturers gave 16 lectures, comprising 52 hours on mathematics, 9 hours on physics, and 10 hours on methodology. The performances differed in content and perception: infinitesimal computation, spatial geometry, group theory, topology, number theory, vector theory, theoretical physics, and methodology. Participants could discuss their pedagogy and professional issues with each other and their former professors. Bukovszky advocated the importance of attending conferences on professional development to improve teaching skills.

Besides describing a training course, Bukovszky (1943) introduced an interesting teaching aid in the 77th volume of the *Journal*, which was the last full volume. In his mathematics class, Bukovszky applied the idea of flip books, which are booklets with a series of images that gradually change from one page to the next as one flips the pages rapidly, so the images appear to be animated by simulating motion. Bukovszky provided an example how he taught Thales's theorem with the help of flip books. The process consumes a few hours to produce 10-20 pages, which made teaching more "colorful, alive, attractive, and effective" (p. 32).

5.3.3 Book Reviews

Between 1918 and 1944, 16 articles focused on book and journal reviews (see the distribution of these articles in Table 5.3). The main aim of the reviews was to introduce teachers to existing literature.

Table 5.3: Distribution of Book/Journal Reviews in *Journal of the National Association of Secondary School Teachers* Between 1918 and 1944 by Type

Type of Book/Journal Reviews	# of Articles
Hungarian book review	15
Hungarian journal review	1
Total	**16**

During the second era of the *Journal*, all articles in this section for reviews introduced only Hungarian textbooks or a journal. Several articles selected by subcategory (arithmetic, algebra, geometry) are briefly showcased below. Erdős (1929) introduced a book on mathematic competition; Goldziher (1924) reviewed a book about logarithms; Tóth (1942) discussed a publication on arithmetic; and Jelitai (1935, 1936b), Rados (1937), and Veress (1943) all considered works on differential and integral calculus.

The last mathematics-related article published in the *Journal of the National Association of Secondary School Teachers* in 1943 examined didactic issues in mathematics education by reviewing Zágoni-Barra's book titled *Teaching Mathematics* . Maróthi (1943) stated, "We all want to educate Hungarian children to be good citizens by teaching quantity theory, and in order to achieve this goal, we need systematic teaching based on principles of children's psychology and education theory" (p. 257). Maróthi acknowledged that such a complete and practical Hungarian methodological work had not yet been published until that book arrived.

5.3.4 Summary

Between 1918 and 1944, the number of mathematics-related articles significantly decreased in the *Journal*. From the 263 (90% of the total articles) articles published during the first 51 years of the Austro-Hungary Monarchy, the number of articles dropped to 27 (10% of the total articles) over the last 27 volumes.

The splendid progress of Hungarian education was deeply impacted by World War I and the following Treaty of Trianon. The work of the Association and the *Journal* was difficult to maintain. In fact, over several years, the progressively fewer articles mainly focused on discussing general education issues and introducing new education laws; subject-specific articles including mathematics no longer appeared in the *Journal*.

The relative handful of articles during the second period concentrated on two major issues in mathematics education: (1) the content of mathematics teaching, and (2) teacher training. One of the biggest shortcomings of Hungarian secondary mathematics education in this era was that critical thinking and problem-solving activity declined. In the 1920s and 1930s, new educational laws indicated the growing intention to expand state control over educational institutions. The Secondary Education Law in 1924, an amendment of the Law of 1883, severely narrowed the tasks high schools could execute. The full curriculum in parallel with this law was published in 1926. Its objectives were to emphasize the concept of function and abolish the sharp separation between algebra and geometry. To improve scientific and functional reasoning, the articles during this time revisited the idea, as recommended by the Hungarian Mathematical Reform Subcommission in the early 20th century, of including higher-level mathematics such as calculus in this new hybrid of high school. The works of Cantor, Hilbert, Zermelon, Perron, Leibniz, Möbius, Hamilton, and Grassmann were discussed.

The educational laws in the 1920s and 1930s also regulated the training and qualifications of secondary school teachers. To improve the content and pedagogical knowledge of this new generation of teachers, the articles described training courses for professional development organized by the Ministry. In two articles, the authors introduced teaching methods from the United States as well as psychological and methodological issues discussed at international mathematical Congresses.

As in the previous era, the majority of the articles (59%) discussed book and journal reviews. However, unlike the earlier period, no foreign textbooks were presented at that time. In the 1920s and 1930s, neo-nationalism ideology led authors to discuss and review only new Hungarian textbooks.

5.4 Contributors to the Journal

This section introduces the editors and prominent authors who contributed articles to the *Journal of the National Association of Secondary School Teachers* during its existence between 1868 and 1944.

5.4.1 Editors of the Journal

The editors of any journal strongly define its characteristics since they have final responsibility for its operations and policies. The *Journal of the National Association of*

Secondary School Teachers featured the editor's name on the title page for each volume. Details including their names, years of service as editor, and areas of specialization are presented in Table 5.4. Twenty-one male editors covered the 78 volumes; no female editors ever served in this position. Length of service varied from 6 months to 10 years. Partial or full bibliographies were found for 18 of the 21 editors; only three editors had degrees in mathematics: Bernát Alexander, János Waldapfel, and Ede Lévay. Despite having editorial oversight of the content, no editor published articles on mathematics education in the *Journal.* The short bibliographies that are available are briefly discussed below.

The bourgeois state that developed under the Monarchy needed the practitioners of each profession to have appropriate expertise. An essential requirement for this was the uniform use of technical language. After a law was enacted in 1844 making Hungarian the country's exclusive official language, the formation of the Hungarian technical language of sciences lasted throughout the 19th century. The importance of this issue was emphasized in the *Journal of the National Association of Secondary School Teachers* by having the areas of specialization of most of its editors as either languages or history.

By the last decades of the 19th century, the subject of mathematics became an important component of the Hungarian secondary education curriculum, which was aligned with the international reform movement to improve mathematics education by the turn of the 20th century. The appointment of the three editors (Alexander, Waldapfel, and Lévay) who had mathematics as their area of specialization seemed to coincide with the spread of international education reforms in Hungary. Altogether, they served 13 years during that 23-year period between 1891 and 1914.

Table 5.4: Editors of *Journal of the National Association of Secondary School Teachers*

Editor	Years Serving as Editor	Number of Years as Editor	Area of Specialization	Source
Szamosi, János	1867-1872	5	Greek literature, Philology	Gulyás, P. (1990)
Névy, László	1872-1882	10	Hungarian language and literature Classical philology	Gulyás, P. (1990)
Köpesdy, Sándor	1882-1883	1	Hungarian literature Foreign languages – Latin, Greek, German	Gulyás, P. (1990)
Malmosi, Károly	1883-1884	1	Foreign language – Latin	Gulyás, P. (1990)
Szarvas, Gábor	1884 -1885	1	Linguistics	Gulyás, P. (1990)
Sebestyén, Gyula	1885-1886	1	History	Kenyeres, Á. (2001)
Volf, György	1886-1891	5	Linguistics	Kenyeres, Á. (2001)
Alexander, Bernát	1891-1896	5	Philosophy, Aesthetics, Literature, Mathematics	Kenyeres, Á. (2001)
Rajner, Ferencz	1896-1900	4.5	Literature	Gulyás, P. (1990)
Balogh, Péter	1900-1904	2.5	Hungarian language and literature	Gulyás, P. (1990)
Négyesy, László	1904-1906	1.5	Literary history, Aesthetics	Kenyeres, Á. (2001)
Waldapfel, János	1904-1906	1.5	Pedagogy Foreign language – German Mathematics	Kenyeres, Á. (2001)
Székely, István	1905-1906	0.5	Theology	Gulyás, P. (1990)
Lévay, Ede	1907-1914	7	Mathematics	Kenyeres, Á. (2001)
Ady, Lajos	1914-1920	0.5	Literary historian, Pedagogy	Kenyeres, Á. (2001)
Marczinkó, Ferenc	1920-1922	2.5	Not found	
Szőts, Gyula	1922-1924	2	Not found	
Dr. Kovács, Dezső	1925-1927	3	Hungarian literature Foreign language – Latin	Kenyeres, Á. (2001)
Dr. Nagy, Pál	1927-1934	6.5	Not found	
Dr. Kardeván, Károly	1934-1943	9	Literary historian	Kenyeres, Á. (2001)
Dr. Hajdú, János	1943-1944	2.5	Cultural historian	Kenyeres, Á. (2001)

The first editor with degree in philosophy, aesthetics who also studied mathematics was Bernát Alexander (1850-1927), who served between 1891 and 1896 (5 years). A well-known philosopher, Alexander completed his high school at the 5th District Royal Catholic Gymnasium in Budapest, where Szende Riedl, a teacher of psychology, and Flóris Rómer, a teacher of the sciences, had a remarkable influence on him. At the University of Budapest, Alexander studied the natural sciences and mathematics in addition to philosophical and literary studies. After a 6-year study trip to Germany, France, and Great Britain, Alexander returned to Hungary in 1874. He became a professor of history and philosophy at the University of Budapest. Alexander had been involved in the work of the National Council for Public Education in the early 1890s and played a significant role in the preparation of reform secondary school proposals.

The second editor with philology and mathematics degrees was János Waldapfel (1866-1935), who served for a shorter period (1.5 years) at the *Journal*, between 1904 and 1906. He taught pedagogy and German at the Teacher Training Institute in Budapest. He played an important role in promoting practical teacher training, particularly in movements aimed at introducing pedagogical reform ideas. He wrote articles and discussions based on the pedagogy of Herbart and Kármán (Kenyeres, 2001).

The third editor who had a degree in only mathematics was Ede Lévay (1864-1928). He served as editor between 1907 and 1913 (7 years). He earned his teaching degree and doctorate at the Faculty of Mathematics and Natural Sciences in Cluj-Napoca. He was a high school teacher in Szeged, Nitra, Bratislava, and then Budapest. After 1914, Lévay became the director of the 5th District Main Real School of Budapest. He also published several high school textbooks.

5.4.2 Authors Published in the Journal

In the typical format of the *Journal*, each author's first and last names as well as the city from which the article was submitted were displayed usually at the end of the article. A total of 107 authors contributed their work on mathematics education to the *Journal*; 68 published only one article, while six contributed more than 10 articles. Only two papers were co-authored. The 42 authors who published two or more articles or played a key role in Hungarian mathematics education in developing the *Journal* are presented in Appendix C. This appendix table contains the authors' names, the number of articles they wrote, first and last years of their publications, years of their birth and death, and the towns in which they worked. Where available, the table also contains information about their high school and/or university teaching experience.

Based on the current findings, 30 authors taught only at secondary level, and additional 10 also lectured at higher education. Two of them were university professors, with no experience at secondary level. Out of the 42 authors, three had position at the National Association of Secondary School Teachers and/or the Ministry of Religion and Public Education. Seven were popular textbook writers of their time. At the turn of the 20th century, four authors were members of the Hungarian Mathematical Reform Subcommission. Not surprisingly, all of the authors were Hungarian males.

The following section presents brief biographies of the authors who had a major influence during the two periods of the *Journal of the National Association of Secondary School Teachers*, namely: (1) 1868-1918: Austro-Hungarian Monarchy, and (2) 1918-1944: Hungarian Republic, followed by Hungarian Kingdom Without a King.

5.4.2.1 1868-1918: Austro-Hungarian Monarchy In this subsection, the researcher introduces short biographies of ordinary secondary school teachers, secondary school teachers with administrative role(s), and secondary teachers who were also textbook authors. It also discusses the biographies of two prominent university professors (without high school experience), and school teachers who also were members of the Hungarian Mathematical Reform Subcommission.

The example of ordinary teachers was József Mayer, Ferenc Mendlik, and Ignácz Szirtes. Mayer (1839-not known), who wrote four book reviews and an article on his teaching method in trigonometry during the first decade of the *Journal*, was an ordinary teacher at the Academy of Commerce between 1865 and 1883. The Academy of Commerce, founded by the Pest-Buda Chamber of Commerce and Industry in 1857, was the first professional commercial/trade institution in the Central European region, and the second such institution in Europe after the ESCP Business School in Paris. Mendlik (1838-1902) wrote six articles over almost 3 decades of the *Journal*. His first two articles in 1870 and 1885 were book reviews; then, in the 1890s, he shared his experience and opinion about how to teach arithmetic and algebra. After teaching several years in the countryside, Mendlik became a mathematics teacher at the State Main Real School in 1872 in Pest, where he taught Manó Beke and Gusztáv Rados. Szirtes (1850-1922) published 11 articles on geometry curriculum as well as book reviews for more than 3 decades between 1878 and 1910. After teaching geometry and mathematics in the countryside at Pančevo and Pécs, Szirtes became a teacher at the 6th District Real School in Budapest in 1893.

There were ordinary teachers who had additional interest besides secondary teaching such as Samu Bogyó and Ignác Rados. Bogyó (1857-1928), wrote four articles about his teaching experience as well as book reviews in the *Journal*. Bogyó, who was a teacher at the Academy of Commerce, also worked as an actuarial mathematician for several large banks. Ignác Raussnitz Rados (1859-1944) published eight articles over 40 years between 1894 and

1937 in the *Journal*. He was one of two authors who published articles in the two eras examined above. He discussed six curriculum recommendations and wrote Hungarian and German book reviews between 1894 and 1911 and two Hungarian book reviews in 1929 and 1937. Rados was one of the first Bolyai researchers. As a certified mathematics and physics teacher in 1883, he taught at the Academy of Commerce from 1884 to 1920. He was the older brother of Gusztáv Rados, who played an important role in the international reform movements and was a founder of the Hungarian Mathematical and Physical Society.

Some secondary teachers also served in an administrative role such as Károly Schröder and Flóris Wohlráb. Schröder (1840-1895) who first was an ordinary teacher at the countryside then became a principal published three articles between 1868 and 1877. After graduating Polytechnic School in Vienna and the Prague University of Technology as an architect, he traveled to England, France, and Germany to gain more experience and knowledge. Then, Schröder dedicated his life to geometric education and became the principal of Kremnica High School. Flóris Wohlráb (1853-1909) was one of the most prolific authors of the *Journal*, with 13 articles on mathematics education between 1875 and 1886. Besides being a high school teacher, he was also a board member of the National Association of Secondary School Teachers. He spoke Hungarian, German, and French. Wohlráb was board member and secretary of the Association for 6 years as well as editorial board member of the *Journal*. He graduated as a mathematics teacher at the Royal Joseph Technical University. After Ábel's death, he became a tenured teacher at Royal University High School (Szinnyei, 1914).

Besides being a secondary school teacher with administrative roles, some authors were famous textbook writers. The most popular mathematics textbooks of the 1850s were written by Lutter; then, in the 1860s by Császár, Ábel, and Mauritz, followed in late 1870s by Suppán.

Lutter's mathematics textbook series was widely used in Hungarian secondary schools, in addition to the Hungarian translation of standard Mocnik textbooks in the 1850s. Lutter (1820-1891) became a high school mathematics teacher for several months during the Habsburg Empire in 1848. Because of his activity as a national guard for the artillery during the revolution against the Habsburgs in 1848, he was banned from teaching until 1852. Later, he became a corresponding member of the Hungarian Academy of Sciences in 1859 and a high school principal at Buda in 1861. In 1867, József Eötvös, Minister of Religion and Public Education, sent Lutter abroad to study public education systems in western countries. Because of his travels, he became thoroughly familiar with Austrian, Prussian, and French mathematics methods end textbooks. His revised textbooks in the late 1870s followed the methodology of foreign education and were used until the 1890s. Lutter published four articles in the *Journal*, two of which discussed curriculum issues by introducing Prussian mathematics education in 1874. The two other articles contained the previously introduced debate between Lutter and Kőnig in 1880. After starting his own journal *Public Education (Közoktatás)* in 1882, Lutter did not publish any more articles in the *Journal of the National Association of Secondary School Teachers*. In 1891, he was appointed a member of the second reorganized National Council for Public Education.

The three well-known textbooks authors in late 1860s and 1870s—Császár, Ábel, and Mauritz—published several articles in the *Journal*. The most fruitful author at the *Journal*, with 21 articles over 20 years between 1869 and 1889, was Károly Császár (1842-1891). In his articles, he introduced Hungarian methods and textbooks. Moreover, he shared his opinion about the newly introduced curriculum. Császár was a pioneer of economic accounting and worked as an actuary. After he taught in several secondary institutions in the countryside and served as a director of a civilian girls' school at Cluj-Napoca (Kolozsvár), in 1869 he became a private university professor at the University of Budapest, teaching lower-level mathematics courses (Borsodi & Tüskés, 2010). After 1882, he became a mathematical advisor to the Hungarian French Insurance Company. In addition to classical languages, he also knew German, French, English, and Italian, and was very knowledgeable in modern literature. His algebra textbook, published in 1867 and revised in 1875, was in use until the end of the 19th century. The second prominent author for the *Journal* with 17 articles between 1869 and 1875 was Károly Ábel (1836-1877). After 1861, he was a mathematics and science teacher at the Royal University High School in Pest. From 1869, his articles discussing mathematics education and the natural sciences appeared in the columns of *Journal of Natural Sciences (Természettudományi Közlöny)* as well as *Journal of the National Association of Secondary School Teachers*. His articles in the *Journal* mostly focused on reviewing Hungarian and foreign (mainly German) teaching methods, textbooks, and journals. His two-volume geometry textbook, published in 1865, was reprinted in several editions and was used until 1920. At the turn of the century, his book was edited by Ede Lévay and Károly Polikeit. It is interesting to note that even the Textbook Committee established in 1925 allowed the use of the Lévay-Poliket-Ábel book. The next prominent author for the *Journal* was Rezső Mauritz (1839-1902) who published his first book review in the *Journal*. Mauritz wrote seven book reviews over 4 years (between 1869 and 1873); then, his last article appeared 10 years later, in 1883. After 1874, Mauritz was the principal of Košice High School; later, in 1891 he transferred to the 6th District State High School in Budapest. His algebra book, published in 1870, had several editions until the end of the 19th century (Rajner, 1903). In addition to writing the textbook, he was also a board member of the National Association of Secondary School Teachers, served in the Mathematics and Physics Society, and was an elected full member of the Pedagogical Society. The next prominent author was Suppán (or Szuppán)

(1854-1933) who published eight articles regarding mostly his geometry teaching methods and some book reviews in the *Journal* between 1877 and 1888. After completing secondary schools in Venice, Vienna, and Buda, he studied engineering at the József Technical University in Pest, then took a high school teacher's exam in mathematics and physics. He began his teaching in descriptive geometry at the Technical University. He also worked for the Minister of Religion and Public Education after 1886 and did significant work in school organization matters as a public education rapporteur for the National Public Education Council. In the late 1910s, he developed the curriculum and organizational rules of girls' secondary schools. Suppán's popular arithmetic textbook was reprinted in several editions.

The two prominent university professors who published articles in the Journal were Sámuel Brassai and Gyula Kőnig**.** In 1872, the Hungarian Parliament established two universities: the Royal Hungarian Franz Joseph University in Cluj-Napoca and the Royal Joseph Technical University in Buda. Brassai (1800-1897) became professor at the newly opened Royal Hungarian Franz Joseph University in 1872, dean of the School of Mathematics and Science in 1875-1876, and rector in 1879-1880. He was a Hungarian linguist and teacher, sometimes called "The Last Transylvanian Polymath" (Kőváry, 1897). He spoke many Western languages and understood Russian, Sanskrit, Turkish, and Hebrew. Between 1869 and 1896, he published five articles in the *Journal* about adopting Hungarian as the professional mathematics language. Kőnig (1849-1913), one of the best-known textbook authors from the 1870s, published only one article in the *Journal* to respond to Lutter's comment on his textbook in 1880. Kőnig was a Hungarian mathematician and university professor who dealt with mathematical analysis, algebra, set theory, and mathematical logic. In 1874, at the age of 24, he became a full professor of the mathematics department at the Royal Joseph Technical University, founded 2 years earlier. With Jenő Hunyady and József Kürschák, he established his mathematics workshop, which gained international recognition. In 1876, he initiated a Hungarian mathematical journal titled *Technical University Papers*. He was the rector of the Royal Joseph Technical University from 1891 to 1894 and dean of the faculty of engineering. Kőnig was one of the founders of the Mathematical and Physical Society, which published the *Mathematics and Physical Journals*.

The last group of the authors who wrote several articles for the *Journal* included prominent members of the Hungarian Mathematical Reform Commission, such as Manó (Emanuel) Beke, Sándor Mikola, and Károly Goldziher, . Beke (1862-1946) published 11 articles on curriculum issues, explaining his teaching methods and reviewing books between 1883 and 1906. Beke was at the forefront of Hungarian mathematics teaching reform efforts after he spent a year in 1884 in Göttingen, where he came into close contact with Felix Klein. He played a significant role in the Mathematical Education Conferences in Rome in 1908, Cambridge in 1912, and Paris in 1914. He was also one of the forerunners of women's secondary and higher education. Beke obtained his teacher's diploma in mathematics and physics at the University of Budapest in 1883 and received his doctorate in 1884. He taught mathematics in high schools in Budapest between 1883 and 1895. Between 1900 and 1922, Beke was a professor at the University of Budapest. He became a member of the Hungarian Academy of Sciences in 1914, although he was removed from office and cut off from the Academy in 1922 because of his conduct during the short-lived leftist government in 1919. After 1945, Beke regained his academic correspondence membership. His studies focused on the irreducibility of linear differential equations, analytic functions, and some questions in algebra. In his memory, the János Bolyai Mathematical Companion in 1951 founded the annual award, the Beke Manó Memorial Prize, for successful mathematical educators.

As Beke, Mikola (1871-1945) was at the forefront of teaching reform efforts. His six articles between 1902 and 1913 in the *Journal* focused on mathematics teaching reform; one of the articles described the reform movement in England. Mikola held a teacher's degree in mathematics and physics from the Faculty of Arts of the University of Budapest. His role as a teacher was significant; his students were several internationally renowned scholars, including Jenő Wigner (Nobel Prize-winning scientist) and János Neumann. His work as a textbook author is outstanding; the methodology of his physics textbooks followed the reform ideas. As a board member, he actively participated in the work of the Mathematical and Physical Society.

At the Commission at the International Congress of Mathematicians in Cambridge, United Kingdom in 1912, Goldziher (1881-1955) represented Hungary. Goldziher published 15 articles regarding mathematical reform movements in Hungary, Germany, and the United States between 1904 and 1917, as well as one book review in the *Journal* in 1924. His research focused on statistics, actuary, and the pedagogy of mathematics teaching. Goldziher studied in Budapest and Göttingen and received his doctorate in 1904. Influenced by Felix Klein, he was one of the Hungarian pioneers of applied mathematics. He taught in high schools and became a university professor in 1911. In 1935, he was awarded the title of extraordinary teacher at the Technical University. After World War II, Goldziher retired from the university due to illness.

During the era between 1868 and 1918, the authors of the *Journal* represented a wide range of educators who were practical high school teachers, university professors, well-known textbook authors, and members of the Mathematical Reform Commission. Only two authors, Rados and Goldziher, published articles after the Austro-Hungarian Monarchy collapsed in 1918. Interestingly, the last article of the first era in 1917 and the first article of the second era in 1924 were published by Goldziher.

5.4.2.2 1918-1944: Hungarian Republic, Then Hungarian Kingdom Without a King

As a result of the end of World War I in 1918 and following the Treaty of Trianon in 1920, many Hungarian intellectuals lived outside the territory of the new, smaller Hungarian state. Many people moved away from Hungarian education, which could be the reason the number of authors and mathematical articles significantly decreased. During the second era of the *Journal* in the Hungarian Republic between 1918 and 1944, only five authors published more than two articles. The researcher only found biographies for three of them: József Jelitai, Gyula Kornis, and Pál Veress.

With his five articles, Jelitai (Woyciechowsky) (1889-1944) was the most prolific author during the second era of the *Journal*. In 1935 and 1936, he wrote four Hungarian book reviews and a report about the International Congress of Mathematicians in Oslo in 1936. Jelitai graduated as a mathematics teacher from University of Budapest in 1912, then earned his doctor of humanities at the University of Debrecen in 1932, where his research focused on the history of Hungarian mathematics. He taught mathematics courses at the University of Debrecen and the University of Budapest. From 1941 until his death, he taught mathematics at the Árpád High School in Budapest.

Gyula Kornis (1885-1958) was a prominent author of the second era for the *Journal*, in terms of his status as the Secretary of State in the Ministry of Religion and Public Education, and he published one article on curriculum in the *Journal* in 1934. He had been a university professor, politician, and member of the Hungarian Academy of Sciences. His role as Secretary of State was to manage Hungarian secondary schools, preparing and implementing secondary education laws in 1924 and 1926, and dealing with curriculum and school organization issues. He went on several study trips to European countries (England, Germany, Italy, etc.) and the

United States. He defended his dissertation at the International Institute of Teachers College, Columbia University in 1932. Back in Hungary in 1944, Kornis was arrested by the Gestapo but was released at the end of the war. In 1945-1946, he served as president of the Hungarian Academy of Sciences, but by the end of the year, his academic membership was terminated because his eclectic philosophical views followed more conservative German philosophical trends. In 1951, Kornis was displaced to the countryside, Poroszló (Kenyeres, 2001).

In the 1930s, the only new mathematics textbook series was written by Veress (1893-1945). He wrote two book reviews in the *Journal* in 1942. After he completed his secondary school studies in Cluj-Napocs, Veress studied at universities in Budapest, Göttingen, and Cluj-Napoca between 1911 and 1915. He served in the military during World War I, and in 1918, he obtained his teacher's certificate and completed his doctoral studies in Cluj-Napoca with Frigyes Riesz and Alfréd Haar. After the Treaty of Trianon in 1920, the new Romanian government expelled him from the country, and he became a high school teacher in Budapest. From 1928, he was a teacher at the Teacher Training Institute in Budapest and, from 1936 to 1939, at the Geometry Department of the University of Budapest. At the end of World War II, Veress died at the Budapest siege. His research area had been economic mathematics and statistics, and his scientific works in the field of mathematics and insurance mathematics were published in Hungarian and foreign journals.

5.4.3 Summary

As mentioned earlier, in bourgeois Hungary after 1867, proper professional training and professionalization became increasingly important. In this spirit, the development of a common professional language became essential in the 19th century. The relevance of this need is demonstrated by the fact that the majority of the 21 editors of the *Journal* were specialized in linguistics and foreign languages. As a result of the 1883 Secondary School Law, the subject of mathematics became an important component of Hungarian secondary education. Following the international reform movements from the United States, the United Kingdom, and Germany in the late 19th and early 20th centuries, Hungarian educators aimed to revitalize secondary mathematics education and reconsider real social needs. The appointment of three editors who specialized in mathematics (Alexander, Waldapfel, and Lévay) concurred with the spread of international education reforms in Hungary. Altogether, they served 13 years during that 23-year period between 1891 and 1914. Lévay's relatively long editorial activity (7 years between 1907 and 1914) seems to coincide with the spread of international education reforms in Hungary. Whether this process justified the appointment of this editor and the stability of his work, or whether, on the contrary, they were integrated into Hungarian research mainly due to his work, cannot be determined based on the available sources.

Between 1868 and 1944, 107 distinct individuals had contributed their work on mathematics education to the *Journal.* Of these, 68 authors published only one article, while six authors contributed more than 10 articles each. Only two papers were co-authored. Among the authors who published more than two articles in the *Journal* or played significant roles in Hungarian mathematics education, the researcher identified a group of ordinary teachers, university professors, well-known textbook authors, and members of the Hungarian Mathematical Reform Commission.

Budapest was the center of Hungarian scientific and mathematics life, as reflected in the fact that the majority of authors either completed their education or taught at a certain stage of their lives there. The large number of Budapest authors clearly showed the outstanding role of the capital in the life of the country.

Apparently, one other major city, Cluj-Napoca, played an important role in the lives of several authors. The founding of the University of Cluj in 1872 gave Transylvanian education a strong boost. The significant role of the university was preserved until the fall of the Monarchy. The longest-lived (100 years) polymath of the era was Sámuel Brassai, who is strongly connected to Cluj-Napoca, was also known in the field of linguistics. Five of his articles were published in the *Journal*, and the importance of his activity was amplified by the fact that he also took a role in renewing mathematical language. In addition to Brassai, Gyula Kőnig, who later acted as a rector of Royal Joseph Technical University, should also be highlighted. Before that, however, he was also the author of one article in the *Journal,* from that perspective, his importance was indicated by the fact that his books were welcomed repeatedly in the book reviews, and his colleagues were encouraged to engage in professional debates.

Of the 107 authors, 12 earned doctorate degree. However, this was not a condition for publication; rather, it was more important that in addition to appropriate professional qualifications the authors were experienced teachers who shared and discussed their experiences in the columns of the *Journal*. The presence of authors with doctoral degrees, by contrast, showed the rank of the *Journal* because it was not considered degrading for those with higher academic degrees to write and be published in *Journal of the National Association of Secondary School Teachers*.

5.5 Conclusions about the *Journal of the National Association of Secondary School Teachers*

The major political and social changes that occurred in Hungary between 1867 and the end of World War II in 1945 affected all areas of life, including education. The *Journal*, published by the National Association of Secondary School Teachers, was the first periodical in

Hungary dedicated specifically to secondary education, and it published many articles in line with the social and political reality of the country. During its existence between 1868 and 1944, the *Journal* published 78 volumes with a range of content materials, but 290 articles were specifically devoted to mathematics education. The majority (90%) were published during the 51 years of the Austro-Hungarian Monarchy, an era lasting from 1867 to 1918.

The Monarchy created a modern Hungary, with unprecedented economic and social growth that lasted until World War I. Because the fast-developing country needed well-skilled employees, more attention was paid to education and modernizing the Hungarian school system. The Public Education Act in 1868 proposed by Minister Eötvös significantly changed Hungarian elementary education, but his attempts to reorganize secondary schools remained in the planning stage for years.

In the early decades of the Austro-Hungarian Monarchy, one of the biggest challenges in secondary education was the lack of a uniform curriculum. As educators tried "curriculum experiments," the articles in the *Journal* reflected efforts they made in their mathematics classes. Educators described the status of mathematics teaching and recommended changes in curriculum and content layout in arithmetic, algebra, and geometry. Suggestions to introduce other subjects such as statistics were also discussed.

The other challenge in mathematics education was the lack of a common Hungarian mathematical vocabulary. In 1844, Hungarian became the official language of the country, but it was not adopted into education until decades later—and, in fact, was still an issue in the early 1900s. Experienced classroom teachers, textbook authors, and even famous linguistic professors such as Brassai discussed the importance of adopting a unified, shared mathematical terminology.

The 1883 Education Act focused on the reorganization of secondary education, particularly highlighting the introduction of new curricula, instruction with new teaching and learning methods, and the resolution of issues with teacher training. The legislators of the 1883 Act planned to merge real schools and gymnasia to move closer to the idea of a unified high school. At this time, mathematics became an important component of Hungarian secondary education curriculum and was essential for further attendance/participation in higher education. High school teachers, university professors, and educators with administrative roles wrote articles to share their instructional practices in individual mathematics lessons, describe their techniques to increase student-involvement, and explain classroom management methods. The necessity for real-life, hands-on activities in mathematics classes was also evident in the articles.

In the early 1900s, the reform movement, initiated by David Eugene Smith (United States) and led by Felix Klein (Germany), recommended teaching analytic geometry, the rudiments of differential and integral calculus, and the function concept in secondary schools. This recommendation was gradually implemented in many countries around the world, including Hungary. The International Commission recommended preparing national reports to formulate national Subcommissions. The Hungarian Mathematical Reform Subcommission, led by Beke and Mikola, intended to reform mathematics teaching in Hungary. Its effort to expand nationally was outstanding and received international attention. Based on the new movement, the *Journal* articles emphasized the importance of introducing infinitesimal, differential, and integral calculus at Hungarian high schools to help students with future professional careers. Also the issue of how to teach mathematics with real-life applications was revisited.

During the Austro-Hungarian Monarchy, between 1868 and 1918, the *Journal of the National Association of Secondary School Teachers* published 263 mathematics-related articles which discussed curriculum and teaching methods and reviewed Hungarian and foreign books and journals. Foreign trends in mathematics teaching were recognized, with several articles advocating that these trends be considered when developing the Hungarian mathematics curriculum.

In the aftermath of World War I, the Austro-Hungarian Monarchy politically and economically collapsed. Losing the war in 1918 and being restructured by the Treaty of Trianon in 1920 affected all areas of life in Hungary, including the publication of the *Journal* to the point that no articles on mathematics education were published for several years afterwards.

Finally, in the early 1920s, neo-nationalism ideology established an energetic education policy. The new country began to prepare a new curriculum and a new law (first enacted in 1924, then again in 1926 about the all-girls' high school). The Parliament passed a new law on secondary schools in 1934, followed by a 1938 law on new curricula. The *Journal of the National Association of Secondary School Teachers* was instrumental in discussing the issues relevant to the new laws and curricula. It published studies dealing with subject-specific, didactic issues and explaining the impact of the new laws and curricula on mathematics education.

During World War II, the existence of the Association and its journal faced extreme challenges. The last issue of the *Journal of the National Association of Secondary School Teachers* was published in December 1944. Even though the Association tried to survive after World War II, it was terminated in 1948 due to political pressure.

Chapter 6: Analysis of *Teaching of Mathematics*

The aim of this study was to add to the social history of Hungarian secondary mathematics education by analyzing the evolution of Hungarian secondary mathematics education between 1867 and 1956 through two key mathematics journals. The previous chapter examined two eras through the publications in the *Journal of the National Association of Secondary School Teachers*: 1867-1918, The Austro-Hungarian Monarchy, and 1918-1944, the Hungarian Republic and Hungarian Kingdom without a King. This chapter focuses on the third period of Hungarian history: the Hungarian People's Republic between 1949 and 1956. The researcher chose to analyze all articles regarding secondary mathematics education in the journal *Teaching of Mathematics*, published from 1953 to 1956. This was the first journal dedicated to Hungarian mathematics education after World War II.

The historical background of the origin of the journal extended back to the end of the 19th century. On November 5, 1891, the Mathematical and Physical Society held its inaugural meeting with the participation of 298 people, and Loránd Eötvös was elected as president, Gyula Kőnig became vice-president, and Gusztáv Rados became secretary. Perhaps the most important task of the Society was to launch a Hungarian-language journal aimed at introducing the development of mathematics and physics to university professors and high school teachers. In *Journal of the National Association of Secondary School Teachers*, Beke (1891a) had introduced the foundation of the Society's journal, the *Journal of Mathematics and Physics*. In 1921, the Society changed its name to the Loránd Eötvös Mathematical and Physical Society (ELMFT). In 1944, the Society lost its assets as a result of World War II and thus, unfortunately, ceased to exist. After the devastation of the war, there was no way to restart the life of the Society for a long time. Finally, on June 21, 1947, it was established in a reformed version as the Bolyai János Mathematical Society (BJMT), one of the legal successors of the ELMFT, in Szeged, a small town in the countryside. It was difficult to manage the operation of the new Society from there, so the BJMT moved its headquarters to Budapest in 1949. The BJMT became a member of the Union of Technical and Natural Science Societies (Műszaki és Természettudományi Egyesületek Szövetsége [MTESZ]) in 1948, and it has been a member of the International Mathematical Union (IMU) since 1956 and of the European Mathematical Society (EMS) since 1990. An important part of the BJMT's work is participating in the editing and publishing of various mathematical publications (Császár, 2004).

After World War II, in 1949, the Soviet Union took over Hungary, establishing the Hungarian People's Republic. Because of Soviet political influence, all previously published journals that appeared before 1945 ceased to exist by 1950 (for example, *Journal of the National Association of Secondary School Teachers, Journal of National Association of Civic School Teachers*, and *Practical Pedagogy*). The Soviet ideology believed that journal literature should be centralized and standardized, and the central management of socialist public education did not require an increased number of journals, but rather it sought to enhance the efficiency of the existing ones. In this new spirit, in August 1953, the Ministry of Education and BJMT published the first issue of *Teaching of Mathematics*, which was the first journal in Hungary dedicated only to primary and secondary mathematics education (Figure 6.1). The journal was published six times a year, every other month, between August 1953 and October 1956, then, after a hiatus following the revolution against the Hungarian People's Republic and its Soviet-imposed policies, from 1958 to 1990. In this chapter, the researcher analyzes the first 20 issues of

Teaching of Mathematics, which appeared in four volumes from August 1953 to October 1956 (until the nationwide revolution). The female editor was Endréné Gádor, and the original editorial board consisted of Ernő Buti, Imre Csáki, László Erdélyi, Ferenc Késedi, Péter Kozma, Béla Ligeti, Vilmosné Pósa, and János Surányi.

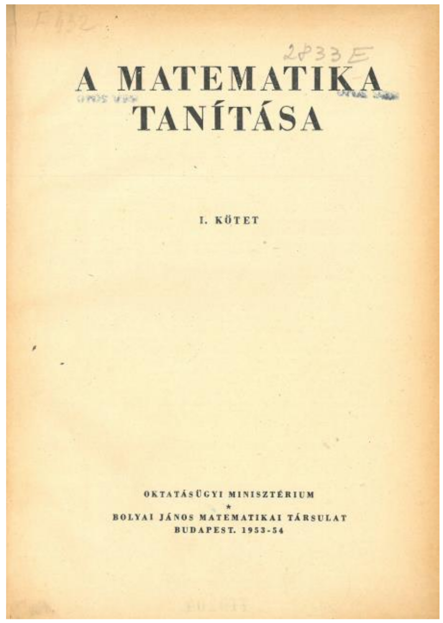

Figure 6.1: Cover Page of First Volume, First Issue of *Teaching of Mathematics*

6.1 Structure of the Journal

In the Foreword of the first issue of the journal *Teaching of Mathematics*, the editorial board stated that after the liberation of Hungary in 1945, there was a need for a mathematical didactic journal that would help guide elementary and secondary school mathematics teachers. The aim and task of the new journal was to address theoretical and didactic issues in mathematics education, everyday practical problems of teaching, and professional development at both the primary and secondary levels.

The Table of Contents of every issue contained the following sections: Method of Teaching Mathematics, Continuing Education, Textbook—Curriculum, Book Review, From the

History of Mathematics, Exercises, Solutions of Exercises, and News. To obtain a better understanding of the nature of the journal, the content published under each heading is examined closely. Accordingly, the main sections of the journal analyzed here are as follows:

- METHOD OF TEACHING MATHEMATICS: This is the largest section dealing with methodological issues in the teaching of mathematics, teaching practices tested by educators, and discussion articles.
- CONTINUING EDUCATION: This section primarily deals with professional mathematical content and problems related to the teaching material.
- TEXTBOOK—CURRICULUM and BOOK REVIEWS: These two sections are linked together because they both feature regular reviews of published domestic and foreign (mainly Soviet) curricula and textbooks.
- FROM THE HISTORY OF MATHEMATICS: This section contains bibliographies of famous Hungarian mathematics educators.
- EXERCISES, SOLUTIONS OF EXERCISES: These sections contain a variety of mathematics problems and their solutions. These exercises are closely related to the selected curricula for primary and secondary school teachers and can be used partly in teaching and partly in professional circles.
- NEWS: This section provides mathematical news for educators.

This chapter examines the articles in *Teaching of Mathematics* related to secondary mathematics because of the focus of this study. Based on the content, the researcher organized the articles related to secondary mathematics education into the following four main categories:

- Curriculum—articles reviewing the school program in general or describing specific problem areas of the curriculum.

- Teaching Methods—articles related to the process of teaching and learning mathematics.
- School Mathematics—articles describing mathematics concepts, proofs of theorems, or articles illustrating the history of mathematics.
- Book/Textbook Reviews—articles including reviews of books and textbooks.

Within each main category, the researcher further divided articles into subcategories such as arithmetic, algebra, geometry, general, and ideology. Articles which introduced more than one subject (for example, algebra and geometry together) were placed in the "general" subcategory. Articles that did not fit into either main category classified as "other." In *Teaching of Mathematics*, the subcategory "ideology" included papers devoted to ideological issues—mainly socialist worldview aspects. These ideological issues of mathematics education cannot be placed into mathematics subject matter. The number of related articles is presented in Table 6.1. A detailed list of all 47 articles related to secondary mathematics education from *Teaching of Mathematics* can be found in Appendix D, according to names of authors, titles, published year and volume, and the categories and subcategories of article content.

Table 6.1: Distribution of Articles from *Teaching of Mathematics* Between 1953 and 1956 by Category and Subcategory

	Curriculum	**Teaching Methods**	**School Mathematics**	**Book Review**	**Other**	**Total**
Arithmetic	--	1	--	--	--	1
Geometry	--	--	2	2	--	4
Algebra	2	2	10	1	--	15
General	1	1	--	2	--	4
Ideology	6	13	2	--	2	23
Total	**9**	**17**	**14**	**5**	**2**	**47**

The contents of the articles were analyzed from the perspective of each author's statements. Out of the 47 articles that satisfied selection criteria, 45 were analyzed; two articles could not be grouped into any of the main categories (curriculum, teaching methods, school mathematics, and book reviews). Additional 21 articles were placed in the "ideology" subcategory because they discussed ideological issues of mathematics education which cannot placed into subcategories (arithmetic, algebra, and geometry). All the articles in this journal were written in Hungarian. Five articles were collaboratively written, with either two authors or a professional organization where individual names were not provided. The single-author articles were written by secondary school teachers and representatives of postsecondary institutions, few of whom were well-known Hungarian mathematicians. There is no discernable pattern to the length of the articles, given that, across all categories, some are very long and elaborate in detail while others are relatively short and more general.

The researcher analyzed the articles in chronological order within their categories. She selected particularly noteworthy articles on unique topics as well as articles discussing similar topics to see how these discussions evolved over time. Also examined were the few articles written by well-known Hungarian mathematics educators or authors who had contributed the most articles to the journal during its years of publication. The section entitled "Contributors to the Journal" introduced the most prominent and influential authors whose work appeared in the journal.

6.2 Curriculum

The curriculum was a major section in the journal *Teaching of Mathematics*. The authors who tackled this topic either referred to specific problem areas of the Hungarian curriculum or discussed general issues related to the curriculum. These articles pointed out the characteristics of the mathematics curriculum at the time and often offered insights into how to fix current problems. Specifically, 19% of the total articles in this journal familiarized readers with ongoing changes in mathematics education as well as the entire school system overall.

The development of Hungarian education after 1945 was more and more perceptibly a function of political changes. From 1949, under the influence of the new communist system, significant reorganizations and the establishment of institutions took place at the secondary and higher education level. After 1950, new curricula were prepared based on the decisions of the Hungarian Workers' Party. All of this had an impact on mathematics education as well.

Below, discussions of selected articles are presented in chronological order within categories and subcategories and reflect views of the authors' political and moral values of mathematics education, mathematics curriculum changes in secondary schools, and the content of mathematics entrance exams for higher education.

6.2.1 Political and Moral Standards

According to the new curriculum introduced in September 1950, the purposes of education were: (1) deepening and further developing acquired knowledge; (2) making students suitable for "jobs that can be filled on the basis of secondary school knowledge" and for further education; and (3) given the spirit of the Marxist-Leninist worldview, fighting against the "reactionary idealist view" (Mészáros, 1996, p. 121). Post-World War II, the so-called democratization of education necessitated changes in the teaching of certain subjects, including mathematics. Based on the Hungarian Workers' Party decision, one of the main aspects of the new curricula was the foundation of a Marxist-Leninist ideology by selecting the appropriate curriculum. An important political goal was to broaden students' access to education and standardize training to meet the needs of the economy and industry for a skilled workforce, as well as to ensure equal access to education for all children. The industry's demand for skilled workers with a strong mathematical background created the new category of "polytechnic education."

In *Teaching of Mathematics*, several articles were devoted to the question of "polytechnisation." Ponomarjov (1953) published an article in a Soviet journal called "Mathematics at School" (математика в школе) (Issue 3, 1953) about polytechnic education and mathematics teaching. This article was translated into Hungarian by György Lovas and published in *Teaching of Mathematics.* According to Ponomarjov, in 1952, the 19th Party Congress in the Soviet Union set the task of starting polytechnic education at the secondary level. The aim of this decision was to increase the effect of socialist education in schools and to allow students leaving high school to choose their profession freely. Mathematics played an extremely important role in the implementation of polytechnic education. "If one does not know mathematics, one cannot learn the science either" (Ponomarjov, 1953, p. 65). Ponomarjov indicated that for successful polytechnic education, students should be able to perform different mental calculations; work with tables; be familiar with geometric constructions; use tools for calculations such as calculation frame and logarithms; apply their mathematical knowledge to related subjects such as physics, chemistry, astronomy, and natural history; and acquire some practical skills (e.g., taking measurements in the field, calculating the surface and volume of 3D shapes, and making models).

Ponomarjov also emphasized the importance of class trips to factories so that students are introduced to technology, work tools, and the general scientific principles of socialist production. He also emphasized the importance of every teacher's qualification, arguing that the teacher himself/herself is at the heart of the whole pedagogical process. According to Ponomarjov, Soviet teachers educate students and connect theory with practice through socialist construction. To do this, teachers must know the curriculum, demonstrate different methods of the teaching process, and be proficient in Marxist-Leninist theory. Ponomarjov cited the words of Comrade Stalin's work "Economic Problems of Socialism in the Soviet Union," suggesting that the material of the Party Congress was a classic study for everyone.

Political and moral education in the teaching of mathematics was further discussed by Vadas (1953). He stated that the school is responsible for teaching not only the subject but also dialectical materialist worldviews, political self-awareness, and socialist patriotism. Vadas noted that in the past, Hungarian capitalists and landowners had no interest in effective mathematics education because educated people would have demanded their rights and recognized the abuses of the social order. Therefore, mathematics was treated as an ancillary subject; its curriculum was intentionally formal and dry (so-called formalism) and significantly separated from other subjects. Vadas stated that in socialist education, however, mathematics develops important traits, so mathematical literacy should be made a public treasure for the widest range of workers. The direct effect of mathematics is promoting practical social orientation in students, such as the ability to interpret statistical diagrams, the structure of railway schedules, practical measurements, trigonometry in surveying and mapping, and approximations in technical calculations. The indirect effect of mathematics is promoting scientific thinking. Vadas stated that the correct, careful teaching of mathematics itself is a valuable political act. In Hungary and other socialist countries, the introduction of mathematics helps to deepen patriotism and internationalism. However, for mathematics teachers to be able to teach the subject effectively in the service of political and moral education, it is important that they be self-conscious, self-assured, and versatile educated individuals.

6.2.2 Curriculum Changes

Some articles in *Teaching of Mathematics* recommended making mathematics curriculum changes in all 4-year secondary schools. For example, Faragó (1954) stated that the current mandatory textbook for fourth grade (the last year of high school) written by Hódi-Szász-Tolnai was confusing for both teachers and students. He discussed the importance of functions at the high school level based on the work of Felix Klein and later of the modern work of V. M. Bradis, both of whom believed that the heart of mathematics teaching is the concept of function. Bradis also emphasized that dialectical connections in the world can be described through functions. Faragó suggested that in the first year of high school, the introduction to mathematics should start with the system of linear equations. Then later, the mathematics curriculum should move into irrational numbers; quadratic, exponential, logarithmic, and trigonometric equations; and functions. Finally, the last year of high school should discuss spatial geometry, rational roots of higher-order equations, and functions, plus review all 4 years of the material for the maturity exam. These recommendations were useful to help novice teachers to organize their teaching material.

6.2.3 Mathematics Entrance Exams

After World War II, higher education was also the scene of a series of reforms. On May 12, 1952, the Council of Ministers decided to select candidates for college and university studies based on written and oral entrance examinations. Reiman (1955) shared the experiences of mathematics entrance exams at Eötvös Lóránd University in Budapest during the summer of 1955. He primarily focused on the mistakes students made. Since the Ministry of Education had sent each high school a brief outline of the requirements of the university entrance examination, Reiman stated that the university expected students to know them. However, the selection committee found serious gaps in the students' knowledge. Several schools focused on the final matriculation exams and did not prepare students for the separate entrance exam. Reiman stated that this unfortunately put students at a disadvantage because, based on their results on the maturity exams, students felt they can bypass preparing for the entrance exam.

6.2.4 Summary

During the third era, nine articles from the *Teaching of Mathematics* journal discussed topics in mathematics curriculum as one of the most important categories in their columns. After World War II, the Hungarian school system was restructured by new educational policies following Soviet ideology. In 1950, a new curriculum was introduced for secondary schools. The officially declared pedagogical goal became to prepare teachers to educate conscious, disciplined citizens who would build socialism. Two-thirds of the articles discussed general issues in the mathematics curriculum. Authors emphasized including dialectical materialist worldviews, political self-awareness, and education for socialist patriotism in all subjects. To achieve this goal, it was important to increase political and moral awareness in mathematics education. Thus, an important article translated from a Soviet journal introduced the idea that socialist education could develop important personal traits through mathematics; moreover, with "polytechnic education," it was possible to train skilled workers with a strong mathematical background.

Only a handful of articles in this category discussed the mathematics-related changes made in high school curricula during this time. One article particularly focused on the relevance of teaching real-life mathematics applications with functions based on the work of Felix Klein and V. M. Bradis. Other articles discussed how the mathematics content in high schools could prepare students properly for oral and written entrance examinations to attend higher education institution.

6.3 Teaching Methods

In another important category, a number of articles discussed general teaching and learning methods for mathematics and described teaching methods for specific areas of mathematics. The authors shared their experiences and offered recommendations for how to approach teaching topics; they also encouraged other teachers to examine and reflect on their own teaching methods. Approximately 36% of all the articles, the largest category, in the journal discussed teaching methods at the secondary level.

The very first article on teaching methods was published in 1953 by the Department of Mathematics at the Budapest Teacher Training Institute on the experience of teaching mathematics in high schools. The Department claimed that teachers were prepared better than they were previously. However, the Department also found that teaching some topics of arithmetic, algebra, and geometry was inadequate. To develop solid subject knowledge without formalism, they suggested ways the state and local government could help teachers improve their teaching methods. The Ministry of Education gave help by regularly publishing mathematical methodological letters and organizing conferences and professional developments. In its article, the Department of Mathematics also emphasized the important role of local-level professional circles. These working communities can provide direct help in the mathematics teaching and learning process (Budapesti Pedagógus Továbbképző Intézet Matematikai Tanszéke, 1953).

6.3.1 Review Lessons and Homework

One working community, Budapest Eötvös Gymnasium Professional Working Community, published an article about the importance of review lessons, especially in the first year of gymnasia (Budapesti Eötvös Gimnázium Szakmai Munkaközössége, 1953). Its findings showed that some students who finished elementary schools still lacked the adequate knowledge required for high school mathematics. Therefore, the Professional Working Community felt it had become necessary to review elementary school material in the first year of high school. It stated that assigning problems from Larichev's textbook, published in 1953, helped bring students to the same level. It also mentioned the importance of verbal and mental counting to solve simple arithmetic problems. After some review lessons, the Professional Working Community recommended assessing students' subject knowledge separately in arithmetic-algebra and geometry for proficiency in numeracy, problem-solving skills, and level of independent thinking. It felt that filling in the remaining gaps should be achieved individually through tutoring, peer-to-peer tutoring, and assigning the still-missing part as a homework assignment.

The political and economic situation in Hungary at that time required teachers to educate a so-called socialist type of person who was responsible for her or his own work and study. Several articles discussed the importance of homework and assessment as individual work. Marót (1953) stated that while the Hungarian Workers' Party issued several guidelines to help teachers, it was commonly understood that students struggled to learn mathematics. To develop a better learning method, Marót suggested that students review class notes several times at home, then solve homework problems. He emphasized the role of teachers to assess the effectiveness of this individual learning regularly. Késedi (1955) shared his experience of visiting mathematics classes in general gymnasia in Budapest during the months of November and December in 1955. Along with his colleagues, Késedi, a supervisor working in the Ministry, found that students' subject knowledge was generally satisfactory, but there were large differences between schools. They observed a lack of calculation skills, problem-solving skills, and logical thinking. They also recognized an insufficient amount of independent work. To develop independent work and problem-solving skills, Késedi and his colleagues recommended increasing the amount of homework.

6.3.2 Assessments

In conjunction with different teaching methods, the importance of regular assessments as an essential tool to deepen knowledge was discussed in several articles. For example, Juhász (1954) stated that formal and summative assessments are an integral part of every mathematics lesson. He believed that they are excellent for (a) repeating and systematizing older knowledge, and (2) embedding new knowledge. Havas (1954), Faragó (1955), and Bori (1955) discussed that one of the biggest challenges in mathematics teaching was developing students' accountability for their own learning. They believed in the importance of performing homework assignments individually. They shared methods of checking them properly in class: several students have to answer verbally at the board, while some students answer-in written form at their desks. In his article, Bori (1955) also recommended his practice of giving some practical, easy, and quick-to-solve mental problems to his students at the beginning of class. He created a sample library of verbal numeracy practice tasks for all areas of mathematics. His students calculated an average of 25 examples per class, for a total of 5,000 per year. Havas, Faragó, and Bori all believed that frequent questioning forces students to prepare daily, which then improves students' problem-solving and numeracy skills.

6.3.3 Formalism

Formalism in mathematics was also an important theme explored in this journal. According to Bradis (1951), an important Russian pedagogue of the time, "formalism in the field of learning mathematics sometimes manifests itself in the fact that the student—it may well be that he knows some general definitions and theorems—is difficult to apply even in specific, somewhat special cases” (p. 115). Since formalism means excessive automation in solving problems without thorough understanding, eliminating it from mathematics was recommended. Hódi (1954) gave a lecture on formalism in a teacher training course on January 24, 1952, and dedicated his article to Rózsa Péter, Doctor of Mathematics, for her 50th birthday, whose mathematics textbook (published in 1949) fought against anything that could lead to formalism in the teaching of mathematics. Hódi stated that formalism, on one hand, can occur in both algebraic and geometric problems in such a way that the content of the examples is completely detached from practice. One example he gave was that before the liberation, the teaching of geometry and spatial geometry in high school was characterized by an excess of notations, causing students to lose interest in geometry. On the other hand, it is an important mistake if the teacher insists on using theory in each lesson. As an interesting example of formalism, Hódi showed a problem from an earlier mathematics maturity exam, in which students had to calculate the volume of a sphere. The sphere was described as hell from Dante’s *The Divine Comedy.* In his article, Hódi provided additional examples that could help teachers use in their classrooms to fight against formalism. According to Hódi (1954),

> the most effective way to prevent formalism is to discuss several solutions based on different ideas and possibly requiring different prior knowledge in relation to a suitable task. Let us emphasize that the most valuable solution is the one that is the simplest, the shortest, and also relies on relatively the least prior knowledge. We encourage our students to create such elegant solutions. (p. 105)

The goal of his article was to eliminate formalism from the classrooms.

6.3.4 Instructional Practices

Several teachers wrote articles in which they shared what they felt were the best methods to teach specific topics. For example, Vilmosné Pósa (1953), an instructor at the Department of Mathematics of the János Csere Apáczai Pedagogical College, discussed the dilemma of teaching equations with so-called “type problems” whose solutions led to linear equations. Pósa suggested that when starting to solve equations in algebra, teachers can introduce several “type examples” or “thinking exercises.” As one of these thought-provoking exercises, Pósa presented a problem from the book *Problems in Elementary Mathematics for Home Study,* written by Antonov, Vygodsky, Nikitin, and Sankin. The book was a collection of 928 problems in arithmetic, algebra, geometry, and trigonometry with answers. Problems with similar solutions were grouped together, with detailed examples of the solution for the first problem in the group. Pósa used a problem from that book: “At 8:00 a.m., a pedestrian leaves the collective farm toward the station, going 5 kilometers per hour. After 4 hours, a cyclist will emerge at a speed of 15 kilometers per hour. When will he catch up with the pedestrian?” (p. 135). She recommended that students first apply the trial-and-error method, followed by a whole-group discussion, and concluding with a class setup of a general solution. Pósa considered solving mental tasks a very powerful tool for logic training to prepare students for more abstract mathematics problems. Gömböcz (1954) agreed with Pósa and provided some real-world problems with similar structures to find general solutions for linear equations. One of his examples was the following problem: “A certain job would be completed by two labor brigades separately in nine and seven days. Working together, how many days will it take them to complete the same job?” (p. 71). Gömböcz suggested that after some of these specific numerical examples, the class can move on to identify the steps of a general solution. Both Pósáné and Gömböcz agreed that by scaffolding more difficult problems, these methods would allow students to learn new concepts.

6.3.5 Extracurricular Activities

In this journal, several authors discussed mathematical extracurricular activities. Specifically, Kozma (1954) shared his experience to organize and supervise a mathematical club, called a “professional circle,” in the Ferenc Rákóczi Gymnasium at Budapest. He stated that “the professional circles play an important role in the life of every school, bringing students together with a mathematical interest to meet mathematical needs, deepen their knowledge, and broaden their horizons, thereby further enhancing their interest so that good technical and scientific staff can become later” (p. 15). As he described it, he organized the club in the early 1950s and started with only 12 students. The activities of the club included: (1) solving problems from *The Mathematics Journal for Secondary Schools*; and (2) giving short lectures on number theory, divisibility problems, and vectors. About 20% of the school participants (all members of the professional circle as well as others) at the Rákóczi Gymnasium took part in the Arany and Rákosi National Mathematics Competitions. In a later article, Neukomm (1956) reported the results of the Arany Mathematics Learning Competition organized by the BJMT with the support of the Ministry of Education. In the March 1956 competition, 5,338 students from 225 schools submitted their work. Neukom shared the statistics by school type, student gender, and geographical distribution of the participants in the competition.

6.3.6 Continuing Education: Training Courses

In parallel with the development of the new school system after the country’s liberation, the demand for qualified, retrained teachers with a Marxist spirit increased. The government provided “fast-track” education for mathematics teachers. In the summer of 1947, the first special teacher courses began: After two summer courses and one year of individual study, the first retrained teachers were able to take exams and become qualified to teach. After the university reform in 1949, secondary school teacher training become the responsibility of universities. From the autumn of 1950, a 3-year program of teacher training was initiated at several universities. The courses were held during the summer holidays and were supplemented by 1-year individual consultations.

In 1953, the Central Teacher Training Institute, the Ministry of Higher Education, and the Ministry of Education organized continuing education courses in mathematics for the new generation of teachers. Several articles in the journal discussed these professional development courses.

The authors from the Department of Mathematics at the Central Teacher Training Institute described the experience of compulsory 3-day in-service training for mathematics teachers during the 1953-1954 school year. As part of this training, primary and secondary school mathematics teachers had professional development in algebra. Organizers found that there were serious gaps in the teachers' knowledge of the curriculum. The primary goal of the training was for teachers to handle the mathematics curriculum to be taught confidently. The authors recommended that after acquiring confidence in the subject knowledge, the methods of teaching can be the subject for future trainings. The organizers thanked the active participation of the BJMT and suggested continuing with their cooperation in the future (Központi Pedagógus Továbbképző Intézet Matematikai Tanszéke, 1953).

In July of 1953, the Ministry of Higher Education also offered professional development and organized conferences for teachers. One of the main issues was the content transition between secondary and university mathematics education. The conference was opened by Deputy Minister Albert Kónya and the introductory lecture was given by Gyula Gáspár, an associate professor at the Technical University of Heavy Industry in Miskolc. Gáspár (1953) stated that the current mathematics training was influenced by issues of content, chronology, and cadre politics that were essential for the construction of socialism. Because it is necessary to give the broad masses the best and most usable mathematical knowledge in a short time, high school teachers now should provide a much wider range of mathematical skills than ever before. On one hand, Gáspár praised the increasing number of anticipated students in mathematics competitions and those who sent answers to the problems published in *The Mathematics Journal for Secondary Schools*. On the other hand, he traced the issues with mathematics education mainly to teacher training, especially for teachers who were uncertain about the method to follow. To improve mathematics teaching, conference participants asked the Ministry of Education to review curricula, provide adequate methodological techniques for the university and high school levels, and examine teacher education.

In August of 1953, the Ministry of Education also held its first professional meeting for 65 mathematics teachers in the northeastern rural region of Hungary in Borsod County. In reviewing this meeting, Bede (1953) stated that the main issue in education remained teacher shortages.

A couple of years later, in January of 1956, the Central Teacher Training Institute organized a course to provide professional development for supervisors of mathematics teachers. Gádor (1956) stated that the aim of the course was to develop content knowledge and discuss issues in high school mathematics. Highly experienced Hungarian scientists gave a series of geometric lectures. During the training, participants also revisited the meaning and goal of polytechnic education and discussed the mathematical curriculum. They commented that teachers are required to teach novel ideas and have a more thorough knowledge of interdisciplinary areas as influenced by Soviet mathematical and methodological literature. For example, they recommended discussing the equivalence of equations as per Novoselov's book published by the Library of Socialist Education in Budapest in 1953.

6.3.7 Summary

Between 1953 and 1956, 36% of all articles in the journal *Teaching of Mathematics* discussed mathematics teaching and learning methods for secondary teachers. This was the largest category of articles. The authors of the methods articles often encouraged teachers to examine and reflect on their own teaching methods. Articles were aimed at helping teachers with matters of fundamental importance, such as how to teach, how to liven up the lesson, and how to increase student interest.

To educate a so-called socialist type of person who was responsible for his or her own work and study, articles emphasized regular reviews and proper assessments based on-guidelines issued by the Hungarian Workers' Party. In several articles, authors opposed formalism in teaching mathematics, given that it was thought of as meaningless rote memorization that should be eliminated from teaching practices. Mathematics teachers tried to use all available sources to overcome limited resources for practicing problem solving. Pre-World War II textbooks were replaced, and the authors recommended specific Russian textbooks and problem collections.

The tradition of mathematical competitions, which had emerged at the end of the 19th century, was still in existence after World War II. High school students were encouraged to participate in the school-wide and country-wide events. Organized extracurricular activities (professional circles) to prepare students for competitions, and the results of those competitions, were also discussed at length in the journal. After World War II, Hungary was also facing a severe shortage of qualified teachers, especially teachers of mathematics. The government provided fast-track education for mathematics teachers. Finally, to further improve the content and pedagogical knowledge of new generations of teachers, the journal articles described training courses that were organized and presented throughout the country in the 1950s.

6.4 School Mathematics

The editorial board stressed in the first issue that the journal "should ensure that all those who teach mathematics are in constant close contact with mathematics." This purpose was served by the "Continuing Education" column in *Teaching of Mathematics*. This section served as a platform for exchanging mathematical ideas among mathematicians and teachers. About 30% of all the articles introduced different areas of mathematics. The authors often shared a variety of ways to discuss different theorems and their proofs. Some articles were brief and general, while others offered extensive and detailed information.

6.4.1 Applications of Approximation

In the first volume, Kalmár (1953) introduced methods of analysis for the secondary school. His exhaustive paper was 30 pages serialized over four issues. Kalmár noted that the Soviet high school curriculum devoted more time to discussing inequalities than the Hungarian curriculum. He described methods of analysis in general, mentioning that Newton's and Leibniz's methods were suitable for solving general problems. He also emphasized the importance of approximate calculations in practical problems. Kalmár presented two methods: (1) convergence and limits of sequences of real numbers, and (2) finding solutions with approximations from two sides. He recommended that the first (convergence) should be taught at the higher-level education because of its complexity, while the second (solutions) was already taught in the upper grades of high school. To illustrate this, he provided examples taken from a third-grade textbook by Gallai-Hódi-Péter-Szabó-Tolnai and a fourth-grade textbook by Hódi-Szász-Tolnai.

As Kalmár did, Hódi (1953) also emphasized the importance of expanding teacher and student knowledge of applications of approximation. As a co-author of the previously mentioned textbooks, Hódi described how to apply approximation to solve equations. In his article, he referred to Bjezikovics's books in Hungarian, Weber-Wellstein and Pund's books in German, and Niewemglowski's books in French.

6.4.2 Algebra and Geometry

In a series of articles, Tamás Varga presented different methods for solving quadratic equations at the secondary level. Varga (1955) "analyzed the part of the high school mathematics material dealing with quadratic equations in meticulous, almost hair-splitting detail." (p. 37). First, Varga (1954) showed how to solve quadratic equations with graphing functions based on Gallai-Péter's first-grade textbook; he recommended continuing to solve quadratic equations by factoring. Then, Surányi and Varga (1954) introduced the basic theorem of algebra and its proof. Later, Varga (1955) stated that teaching quadratic equations with functions can help deepen understanding of linear transformations. He provided many examples of how to introduce and discuss quadratic equations and functions.

Further topics in algebra and geometry were introduced by Dux (1956). Using three examples (see Figure 6.2), Dux explained how to teach arithmetic, geometric, and square means of non-negative numbers in pairs by describing them with triangles. He suggested that other averages, such as harmonic mean, square mean, and weighted mean, may be presented as extracurricular activities in mathematics clubs.

Other topics in geometry were discussed by Hódi (1955a), who first reviewed characteristic of cyclic quadrilaterals, then provided 12 problems with detailed solutions, some of which he solved with trigonometry. One of his examples was the following: "By using trigonometric functions, it can be shown that the chordal quadrilateral has the largest area among quadrilaterals with given sides" (p. 110). Hódi (1955b) also noted that the effectiveness of

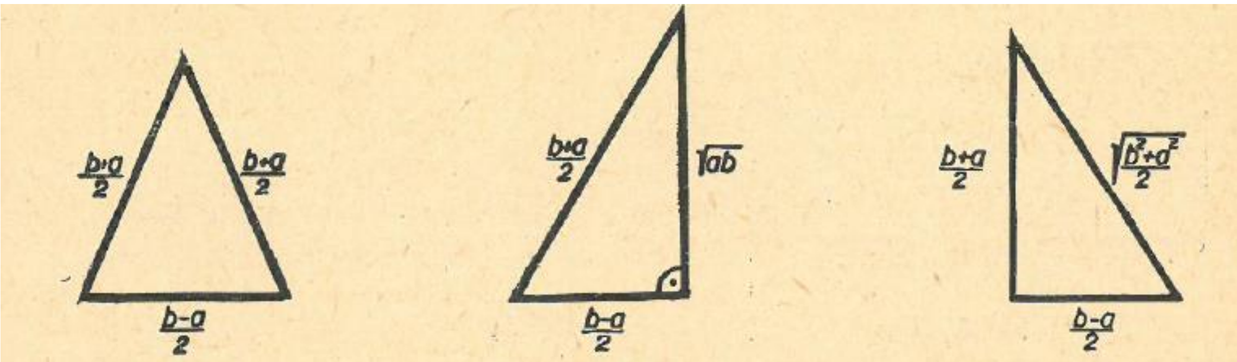

Figure 6.2: Means of a Non-Negative Number of Pairs
Source: Dux, 1956, p. 13

teaching mathematics can be increased by analyzing direct practical applications. He presented trigonometrical examples from almost all areas of the natural sciences such as geodesy, technology, and industry. His examples with detailed solutions were intended to be helpful aids to novice teachers.

6.4.3 Various Topics

Some well-known Hungarian mathematicians published articles in which various topics and different areas of mathematics were covered. The main aim of these articles was to broaden teachers' knowledge about different areas of mathematics. For example, Reiman (1954) introduced the significance of group theory in modern algebra and geometry and provided illustrative examples. Tasnádi (1955) wrote an article about the elements of matrix calculation, noting that matrix calculus was not a new branch of mathematics but had been applied by Hamilton, Cayley, Hermite, and Sylvester in the last century. Tasnádi presented some resources from German mathematicians Jung and Neiss, the English mathematician Mac Duffee, and Russian mathematicians Aitken and Shilov. Hódi (1956) wrote a high-level mathematical article about methods for factoring two-variable quadratic polynomials.

In the columns of the section on professional development in the journal, some authors considered it important to introduce the lives and works of famous Hungarian mathematicians and/or educators as a way for teachers to appreciate and preserve Hungarian national traditions. For example, Ligeti (1954) emphasized the importance of “valu[ing] our transcendental traditions. One of the important means of educating true patriotism is to acquaint the youth with the life and work of the Hungarian practitioners of certain disciplines.” Ligeti wrote about the first Hungarian mathematics books written by András Dugonics in 1784, which were foundational to the field of teaching mathematics, the development of Hungarian mathematical language and mathematics textbook literature. Specifically, he introduced the algebra book entitled *The First Book of Consciousness*; the geometry book entitled *The Second Book of Consciousness*; *Book 3*, which was devoted to trigonometry; and *Book 4*, which was devoted to conic sections. Ligeti stated that Dugonics had no independent discoveries in the field of mathematics, but in his books, he gave his own proofs of several theorems that were different from the old ones and often easier.

Following Ligeti’s idea, Obláth (1954) introduced renowned Hungarian mathematicians who also taught in high schools at different stages of their lives. He briefly presented the work of the following authors in chronological order: Frigyes Riesz, Farkas Bolyai, Pál Sípos, Ágoston Scholtz, Gyula Farkas, Lipót Klug, Dániel Arany (founder of *The Mathematics Journal for Secondary Schools*), József Kürschák, Zoárd Geőcze, Károly Goldziher, Pál Dienes, Mihály Fekete, Gyula Szőkefalvi Nagy, Elemér Török, László Rédei, Pál Turán, György Alexits, Ferenc Kárteszi, Artur Moór, and Ottó Varga. Obláth also mentioned the two very first Hungarian female Doctor of Mathematics who became teachers: Borbála Tedeschi and Evelin Molnár. Obláth (1955) dedicated a full article to Manó Beke, a great Hungarian teacher (1862-1945). The main aim of Obláth’s articles was to share some of the knowledge and interests of the most famous Hungarian mathematics teachers in educational history.

6.4.4 Summary

To overcome the severe shortage of qualified teachers, the government provided several opportunities to support the professional development of secondary mathematics teachers. In addition to organizing training courses, the Ministry of Education dedicated a permanent column in its journal *Teaching of Mathematics* to "Continuing Education." About 30% of all the articles were published in this column. Authors who were both mathematicians and teachers described some secondary-level topics in algebra and geometry in different ways. To improve teachers' mathematical content knowledge, some higher-level content such as analysis and group theory was also discussed.

Another aim of this section was to teach Hungarian patriotism in mathematics classes. Articles devoted attention to cultivating a sense of national pride by introducing the lives and works of famous Hungarian mathematicians and educators.

6.5 Book Reviews

The journal *Teaching of Mathematics* published only five Hungarian and foreign mathematics books reviews. They were very brief, on average between 2-5 pages long. The main aim of these reviews was to introduce mathematicians and others interested in mathematics to the existing mathematics literature. Presented below are summaries of several reviews published in the journal.

For the 1945-1946 school year, schools could only use textbooks that had been reviewed and approved by the National Council for Public Education (Országos Köznevelési Tanács [OKT]). In 1945, the OKT had expressed the need to establish a state textbook publisher to unify textbook publishing across the country. For economic reasons, this did not happen until 1949, when the National Textbook Publishing Company (soon the Textbook Publishing Company) was formed (Kardos, 2007). With this development, textbook “pluralism” in Hungary came to an end. By the end of 1940s, the Ministry of Education directly commissioned authors to develop new textbooks. Between 1949 and 1953, new textbooks were introduced at all levels of the Hungarian school system; the Ministry’s yearly guided curricula dictated what teaching material would be used.

6.5.1 Hungarian Book Reviews

A series of mathematics textbooks for four grades in the gymnasia was introduced over the next 4 years. In 1949, the textbook for first grade (which continued to be used between 1949 and 1956) was written by Gallai and Péter; then, in 1956, a new textbook to replace it was written by Varga and Faragó. In 1950, a textbook for second grade written by Gallai, Péter, Tolnai, and Surányi was introduced. In 1951, a third-grade textbook written by Gallai, Péter, Tolnai, Szabó, and Hódi was launched. This textbook series for gymnasia was completed by 1952, with the fourth-grade volume written by Hódi, Szász, and Tolnai. This textbook series and its subsequent revisions were used until 1966.

Pogány (1953) introduced the evaluation of the textbook series, stating that they followed a new systematization, along the lines of dialectical thinking. Pogány believed that these books aroused students’ interest and love for the subject of mathematics.

In 1953, a new experimental first-grade textbook written by Csánk, Fiala, and Hursán was published to replace Gallai-Péter’s textbook. This experimental book was assigned by ministerial decrees in Budapest and five counties starting in September 1953. It did not become a commonly used textbook and was only used in designated schools until June 1956. Csánk (1953), one of the authors, introduced the experimental textbook in a journal article with a set of examples to illustrate. In particular, he presented the book’s arithmetic, algebraic, and geometric sections in detail. He asked his comrades to write their opinions about the book (and submit them to the journal) to involve a wide range of educators in transforming the book and discovering inevitable mistakes. In the same article, Csánk reviewed Larichev's book entitled *Collection of Algebraic Problems*. In the year of its publication, Varga (1953) had also reviewed the experimental mathematics textbook, suggesting that it represented a major setback in teaching materials, even compared to pre-war textbooks. Varga found that formalism ran through both the geometric and algebraic sections of the book. Even though the book was a disappointment in almost all respects compared to previous textbooks, Varga noted that the section of inequalities was well written, following Soviet methodology and Bradis's exemplary textbook.

In addition to the general gymnasia, vocational high schools were established after World War II. After 1952, these schools were required to use different textbooks that were assigned in gymnasia. In a previously mentioned article, Csánk (1953) also reviewed *Mathematics for Industrial Technical Schools*, written by Gyarmathi-Rapcsák-Török. He introduced the three main sections—algebra, geometry, and trigonometry—and the addendum entitled "Complex Numbers" for electrical technicians. Csánk stated that the book attempted to teach mathematics by applying technical examples requiring a thorough professional knowledge. He praised the book for providing mathematical examples that were applicable to metallurgy, mining, and construction. In addition, Csánk pointed out that both books, the experimental book for gymnasia (discussed above) and this volume for technical schools, served the purpose of polytechnic education by using practical applications of mathematics.

The journal also published some general articles on writing-textbooks. For example, in April 1954, representatives of the Ministry of Education and the János Bolyai Mathematical Society discussed problems related to writing a "good" mathematics textbook. Késedi and Varga

(1954) summarized their general comments as follows: the structure of textbooks should be systematic, knowledge should be presented in a natural logical order, and the connections should be explored clearly. Késedi and Varga suggested that teachers should be provided with a methodological tool accompanying the textbook that includes didactic guidelines. Csánk (1955) responded to this article by Késedi and Varga. According to Csánk, the textbook should ensure a close connection between practice and theory, which is also extremely important for polytechnic training. To write good textbooks, Csánk recommended studying Bradis's methodological book. Csánk closed his article with Lenin's words: "Textbooks provide basic knowledge that has not changed for half a century" (p. 117).

In 1956, Gallai-Péter's first-grade textbook was replaced by a new textbook by Varga and Faragó, who wrote on algebra and geometry, respectively. Both authors detailed their work in the "Book Review" column of *Teaching of Mathematics*. Varga (1956) stated that his new textbook arrived in teachers' hands very late—at the beginning of the school year—which gave them little time to prepare their classes with its methodology. A teacher's guide published with the book could help overcome this issue. The new textbook follows the order of Larichev's well-known textbook with its collection of problems, especially in addressing several new concepts such as accuracy of calculations, illustrating sets, irrational numbers, square root and its calculation algorithm, and the equivalence of equations. One problem in teaching mathematics that Varga highlighted was that students in either the Soviet Union or the German Democratic Republic learned more about mathematics in 10 years than students in Hungary did in 12 years. Varga therefore considered it important that in the near future, it will be necessary to experiment with how to make many important concepts and problems in higher mathematics more understandable to primary and secondary school students. Faragó (1956) introduced the geometric part of the new mathematics textbook, making the case that in the fall of 1957, students who had already learned from the new geometric textbooks in elementary schools had entered the first year of gymnasia. According to Faragó, the merit of the previously used Gallai-Péter textbook was to fight against formalism through many interesting and beautifully written practical examples. Faragó adopted many constructing examples from their textbook. With the more suitable structure of the new textbook, the goal was to present material in the simplest and most expedient way. Faragó briefly described the structure of all the chapters and emphasized that the purpose of polytechnic education was being served by several practical technical exercises.

6.5.2 Foreign Book Review

Between 1953 and 1956, only one foreign book review was published in the journal. Szász (1955) reviewed B. A. Kutuzov's book titled *Geometry*, published in Budapest in 1954. The book is a Hungarian translation of a book for the USSR Teacher Training College (Uchite'skii institute). Szász briefly described the contents of each chapter, pointing out specifically that the tenth chapter explained Euclid's work. According to Szász, Euclid is difficult to access in Hungarian, but Hungarian audiences could now access it indirectly through Kutuzov's book.

6.5.3 Summary

As a result of World War II, Hungary suffered not only a severe shortage of qualified teachers but also a major lack of textbooks and problem collections which could serve the new socialist country. Previous used materials were not aligned with the new socialist methodology. Unlike the *Journal of the National Association of Secondary School Teachers* produced in the previous two eras (1867-1918: Austro-Hungarian Monarchy, and 1918-1944: the Hungarian Republic, followed by Hungarian Kingdom Without a King), this journal, *Teaching of*

Mathematics, contained the fewest number of articles (10%) in the sections on textbooks, curricula, and book reviews.

Articles in *Teaching of Mathematics* discussed the new compulsory mathematics textbooks series introduced for secondary schools, as mandated by the Ministry of Education between 1949 and 1953. The authors of the new series directly borrowed methodologies and examples from Russian textbooks because the new curricula entailed the introduction of textbooks written in the spirit of the declared socialist worldview. Also, more Russian books and problem collections became available in Hungary after World War II. Russia was a significant channel for receiving literature from other countries, and non-Russian books were translated into Russian and then into Hungarian (Fried, 2010). Kutuzov's book including Euclid's work was the only foreign textbook review in the journal.

6.6 Contributors to the Journal

6.6.1 Editor and Editorial Board

Teaching of Mathematics featured the names of its editor and the editorial board on the second page of each volume. Between 1953 and 1956, Endréné Gádor served as editor, and the members of the original editorial board were Ernő Buti, Imre Csáki, László Erdélyi, Ferenc Késedi, Péter Kozma, Béla Ligeti, Vilmosné Pósa, and János Surányi. The members of the board changed in April 1956 to Ernő Buti, Andor Cser, Lajosné Kassák, Ferenc Késedi, Péter Kozma, Györgyné Kulin, Béla Ligeti, Vilmosné Pósa, and János Surányi. The researcher was able to find only partial biographies for most of these editorial members. Gádor was the leader of the didactic team of the Bolyai János Mathematical Society (BJMT), which was one of the publishers of the journal. She also taught at the Department of Pedagogy at the Technical University of Budapest as an assistant professor. For the journal, Gádor published only one article regarding secondary mathematics education.

The well-known mathematician Surányi was a prominent member of the editorial board. Surányi (1918-2006) completed his studies at the University of Szeged between 1937 and 1941. During the 1940s, he was part of Karácsony's circle, where he worked with other first-rate mathematicians like Rózsa Péter, László Kalmár, and Tamás Varga (Gosztonyi, 2016). His areas of interest were mathematical logic, number theory, and combinatorics. He also did important work in mathematics education, especially concerning gifted students. He helped to revive *The Mathematics Journal for Secondary Schools* after World War II. He played a significant role in creating the country's first special mathematics class curriculum in Fazekas High School during the 1960s (Surányi, 2017). He co-authored only one article with Varga for the journal *Teaching of Mathematics*.

6.6.2 Authors of the Journal

In *Teaching of Mathematics*, usually at the beginning of every article, the authors' first and last names along with the title of the article can be found. Twenty-eight distinct authors contributed their work to the journal, but 23 of them only published one article. Three articles were published by a community of authors, although the individual names were not indicated. Two papers were co-authored. Four authors contributed two articles, one author three articles, one author five articles, and one author six articles. A partial or full bibliography was found for 17 authors. Those authors who published more than two articles or played a key role in the development of the journal and Hungarian mathematics education are presented in Appendix E. This table contains the authors' names, the number of articles they wrote, their years of birth and death, and the towns in which they worked. The table also contains information about their high school and/or university teaching experience. All authors were Hungarian, and only two were female. The authors were either mathematics teachers at the secondary level, university professors, or mathematicians by profession. The authors who had played a key role in the development of the journal and Hungarian mathematics in general as practicing secondary teachers, textbook authors, and university professors are presented below.

Some authors who made important contributions to the journal were individuals who taught high school at some point in their lives. For example, Obláth was a professional high school teacher with significant content and pedagogical knowledge. Richárd Obláth (1882-1959) contributed two articles to the journal about famous Hungarian educators. He obtained his teacher diploma in 1905, then taught in rural high schools. After 1909, he worked in Budapest. He was removed from his position after 1919 because of his activities during the short-lived leftist Hungarian Republic. Between 1922 and 1946, he was an actuary mathematician at the Hungarian General Coal Mine Co. and retired in 1946 (Kenyeres, 2011).

Three authors who made important contributions to the *Teaching of Mathematics* were also textbook writers of the time: Endre Hódi, László Faragó, and Tamás Varga. Hódi (1923-2003) was one of the co-authors of the two mandatory textbooks for third- and fourth-grade gymnasia. He also contributed five articles to the journal. In his high school years, Hódi was an excellent problem solver for competitions run by the *High School Journal in Mathematics and Physics*. In 1941, he was admitted to Eötvös Collegium. In the 1943-1944 academic year, he completed an internship with Professor György Békésy. In October 1944, he was enlisted as a soldier and was captured by the Americans. After Hódi returned to Hungary in October 1945, he obtained his high school mathematics and physics teacher diploma in 1947 and began teaching at the Premontrei Gymnasium in Gödöllő. Later, he joined the Department of Mathematics of the

Budapest College of Pedagogy. He left teaching and became a research associate for the Hungarian Optical Works. From 1971, he was head of the Mathematics Department at the National Pedagogical Institute until his retirement in 1985. Meanwhile, between 1959 and 1987, he also served as the lead instructor on the Hungarian team who participated at the International Mathematical Student Olympiad. He was involved in writing and editing several books in mathematics (Radnai, 2014).

Besides being textbook authors for the journal *Teaching of Mathematics*, Faragó and Varga played important roles in restructuring Hungarian public education. Faragó (1911-1966) contributed three articles to the journal. He focused on the psychological foundation of mathematical education and played an important role in the development of socialist pedagogical theory and the socialist school system. He graduated with a degree in mathematics and physics and earned his doctorate in humanities at the University of Budapest in 1933. Between 1933 and 1947, he worked at the Department of Pedagogy of the Pázmány Péter University in Budapest; between 1947 and 1950, he organized the Budapest College of Pedagogy. After 1950, he became a high school mathematics teacher in Budapest. After 1962, he became the head of the Mathematics Department of the National Pedagogical Institute. In 1963, as a UNESCO expert, he worked at the Teacher Training College in Nigeria; there, he wrote and translated pedagogical and mathematical works from English, French, German, and Russian (Kenyeres, 2001).

With his six articles, Varga (1919-1987) contributed the most articles to the journal. Varga became the leading figure of the reform movements for mathematics education in the 1960s and 1970s (Gosztonyi, 2016). He graduated the University of Budapest as a mathematics and physics teacher, then on an exchange scholarship, he traveled to Pisa at the Scuola Normale Superior. During World War II, he rescued several Jews and later, in 2012, received the

Righteous Among the Nations Award from the Yad Vashem Institute in Jerusalem. After the war, Varga lectured at the Ministry of Religion and Public Education and at the Institute of Educational Sciences in Hungary, where he was involved in writing and editing mathematics books. After 1951, he became involved in the training of mathematics teachers at Loránd Eötvös University. Due to his extraordinary language skills and broad interests, Varga was well acquainted with many fields of mathematics, mathematics didactics, psychology, and social sciences. His own research focused on modernizing primary school mathematics education. As a result of the complex experiment he conducted in teaching mathematics, the fragmented nature of the instruction of arithmetic and geometry in Hungary became transformed into a more concise method of teaching one subject—mathematics. Varga wanted to build more on-students' individual thinking, and he expected teachers to see themselves as the students' partners. The modernization of mathematics teaching in Hungary, which officially began in 1974, was based on his experiments. In addition to domestic recognitions, Varga received several foreign honors (Kenyeres, 2001).

Prominent Hungarian university professors, such as László Kalmár and István Reiman, published articles in *Teaching of Mathematics*. Kalmár (1905-1976) contributed a lengthy article in four installments to the first volume of the journal. Kalmár completed his studies at the University of Budapest. From 1927, he was an assistant professor, then later became a full professor at the Institute of Mathematics of the University of Szeged. During the 1940s, Kalmár was part of Karácsony's circle, where he worked with other first-rate mathematicians like Rózsa Péter, János Surányi, and Tamás Varga (Gosztonyi, 2016). From 1947, Kalmár was the head of the mathematics department, where he led the research group of the Hungarian Academy of Sciences in Szeged. He was a versatile mathematician; several of his discoveries related to mathematical logic and computer science. Kalmár developed the idea of a formula-controlled computer and enriched the theory of interpolation, algebra, complex function theory, and analytic number theory with interesting results. In the last stages of his life, Kalmár dealt extensively with mathematical linguistics, diagnostics, and the applications of mathematics to biology, biochemistry, and medicine. In Hungary, he was the instigator of computer science and the organizer of university education in computer computing and the training of programming mathematicians. He established a cybernetics laboratory at the József Attila University of Science in Szeged (Kenyeres, 2011).

Reiman (1927-2012) contributed two articles to the journal. He graduated from Eötvös Lóránd University with a degree in mathematics and physics. Between 1953 and 1970, he was a lecturer with the Faculty of Natural Sciences at Eötvös Lóránd University, then from 1970 to 1996, he worked at the Department of Geometry of the Budapest University of Technology; between 1986 and 1992, Reiman was the head of that department. For 41 years, Reiman prepared the Hungarian team to participate in the International Mathematical Student Olympiads (1961-2002). He taught most of the students who became active and prominent Hungarian mathematicians through the so-called “Reiman Professional Circle” he held every 2 weeks on Saturday afternoons. “From his small notebook, he wrote on the board the carefully selected beautiful and exciting tasks, then pulled into the background. He let the students assert themselves, he only occasionally commented on how to solve a task” (Katona, 2012, p. 129). Under his leadership, the Hungarian Olympic team achieved many great successes. Reiman’s volumes about the Olympics were published in English (Katona, 2012).

6.6.3 Summary

As a result of World War II and Soviet occupation, much of the Hungarian population was forced to change its social status over a period of a few years. As Rákosi attempted to replace the educated class of the past by a new "working intelligentsia, the previous reform pedagogy and middle-class educators were replaced by a new generation of teachers.

The contributors—both editors and authors—to the journal *Teaching of Mathematics* formed a diverse group. Between 1953 and 1956 (from its founding), the journal had one female editor. Of the 47 articles, three were written by a group of authors, and two of them were co-authored. Twenty-eight distinct authors had contributed their work to the journal, and more than 80% published one article. Eight authors published more than two articles or played key roles in developing the journal as well as significantly reforming Hungarian mathematics education.

Between 1953 and 1956, practical secondary teachers (Obláth), textbook authors (Hódi, Faragó, and Varga), and members of the journal's editorial board (Gádor and Surányi) published secondary school mathematics-related articles in *Teaching of Mathematics*. Three educators (Surányi, Faragó, Varga) played important roles in restructuring Hungarian public education. Of the eight authors who were secondary teachers, four held doctoral degrees.

6.7 Conclusions about *Teaching of Mathematics*

Because of its location, Hungary has always been influenced by the countries surrounding it. After World War II, the Soviet Union took over Hungary in 1949, establishing the Hungarian People's Republic. In 1956, a nationwide revolution against the Hungarian People's Republic and its Soviet-imposed policies broke out.

The political and social transformations taking place in Hungary brought about major changes in all areas of life, including education, after World War II. Public education, as part of the 5-Year Plan launched by the Hungarian Workers' Party following the Soviet model in 1949 and modified in 1951, was subordinated to the interests of the Hungarian Workers' Party. The important political goals of this socialist country were to: (1) broaden students' access to education and standardize training to meet the needs of the economy and industry for a skilled workforce; (2) democratize education and ensure equal access to education for everybody; and (3) prepare students for the economic needs of the country and make them politically conscious socialist citizens.

Teaching of Mathematics, the first specialized journal dedicated to mathematics education, was established by the Ministry of Education and the Bolyai János Mathematical Society (BJMT) in 1953, as a response to the central management of socialist public education following Soviet ideology to centralized and standardized journal literature. The journal was published from 1953 to 1956, and resumed after a hiatus from 1958 to 1990, when it ceased publication. Between 1953 and 1956—the focus of analysis in this chapter, the journal presented 47 articles on secondary mathematics education.

By September 1950, a new curriculum came into effect for secondary schools; it adapted Marxist-Leninist ideology to instill in students a firm belief in the superiority of the socialist system. The demand for skilled workers in industry with a strong mathematical background resulted in the new category of "polytechnic education." Several articles in the journal noted the importance of dialectical materialist worldviews, political self-awareness, and education for socialist patriotism. Authors exemplified the importance of "polytechnic education" and incorporating an awareness of political and moral values in mathematics teaching in order to rebuild the country.

In parallel with the development of a new school system after Hungary's liberation, the demand for qualified, retrained teachers increased. Among the goals of *Teaching of Mathematics* was to guide this new generation of teachers. The Hungarian Workers' Party issued several guidelines to achieve these goals. In 1952, they recommended establishing Professional Working Communities in high schools. As the result, these communities published articles in the journal to share their experiences with their colleagues. Practical teachers and educators who also undertook administrative roles discussed their teaching methods, instructional practices, and extracurricular activities. Some articles focused on direct help for teachers since there was very strong opposition to formalism in the teaching of mathematics, which was in line with the socialist agenda of the time.

To address the shortage of qualified teachers, the government provided a "fast-track" education for mathematics teachers. The Hungarian Workers' Party recommended organizing regular professional development sessions. First, continuing professional training courses were organized for both novice and in-service teachers. Several of these courses were first introduced in the columns of the journal. Then, from 1953, *Teaching of Mathematics* featured a permanent section exclusively for "Continuing Education," which served as a platform for exchanging mathematical ideas among well-known mathematicians and teachers.

After World War II, schools could only use textbooks that had been reviewed and approved by the Textbook Committee of the National Council for Public Education (OKT) which published a list of compulsory textbooks in 1947. However, after 1948, the Ministry of Education began to commission authors directly to write the textbooks. Between 1949 and 1952, a new mathematics textbooks series was introduced for secondary schools. This series of textbooks significantly changed the nature of Hungarian mathematics education. Its goal was to develop a new mathematical approach and mathematical thinking, which essentially fought against the practice of formalism. The columns of *Teaching of Mathematics* were suitable platforms for discussing general issues about this new mathematics textbook series.

The contributors to *Teaching of Mathematics* comprised a diverse group. Three articles were published by a community of authors, and two papers were co-authored. Each of seven authors published more than two articles. Some were practical secondary teachers, and others also undertook administrative roles. Four held doctoral degrees. Two never taught in high school but were university professors. The most prominent authors were the first-rate mathematicians Kalmár and Surányi, who were part of Karácsony's circle with Tamás Varga. The most prolific author was Varga, who contributed six articles. He, in fact, became the leading figure of the reform movements in mathematics education during the 1960s and 1970s.

In general, it is clear that the authors contributing to *Teaching of Mathematics* were enthusiastic about offering their thoughts, ideas, and experiences to improve the level of mathematics teaching in Hungary that had been heavily influenced by Soviet and socialist ideologies. Methodologies, math problem collections, and textbooks were directly borrowed from the Soviet Union. In short, the articles aligned with Hungary's social and political realities.

Chapter 7: Discussion and Conclusion

The purpose of this dissertation was to determine how changes in Hungarian secondary mathematics education between 1867 and 1956 were reflected in journal articles of that time. After comprehensive research, this researcher analyzed *Journal of the National Association of Secondary School Teachers* (1868-1944) and *Teaching of Mathematics* (1953-1956).

This research has shown that the history of Hungarian education in general was often influenced by foreign and domestic politics and ideologies. As every country has undergone political and ideological influences in its educational history, Hungary was particularly affected by neighboring countries such as Germany and Soviet Union.

The results of this study supported the following general statements on the history of mathematics education. Schubring (2014) described that the history of mathematics teaching and learning constitutes a profoundly interdisciplinary activity; it has major intersections with history, history of education, sociology, and history of mathematics. Karp (2014) discussed how mathematics education has developed in response to various social needs and proposed a broad approach to the history of mathematics education; thus, it is important to locate a variety of sources that provide different angles to create a complex picture of this historical evolution. Karp and Furinghetti (2016) stated that the current focus of study in the history of mathematics education requires further investigation, with an emphasis on "pre-college" mathematics education. They recommended some under-researched areas for examination such as periodical publications, seminars, and conferences. Karp and Furinghetti stated that more studies should compare the education histories of different countries.

While the history of mathematics education of some countries (Italy, France, Germany, and Russia) has been well explored, other countries, including Hungary, clearly need more research. This research on the history of mathematics education journals in Hungarian can contribute more detailed information to understand Hungarian mathematical education between 1867 and 1956. Studying journal articles provides a unique opportunity to observe real-time communication between educators and administrators and to analyze the effect of social and political changes which influenced mathematics education.

The researcher found similar features in the development of Hungarian journals, as compared to, for example, an English periodical in the article "A Valuable Monument of Mathematical Genius: *The Ladies' Diary* (1704-1840)" by Albree and Brown (2009) and in a French periodical presented in the article "Mathematical Instruction in an International Perspective: The Contribution of the Journal *L'Enseignement Mathematique*" by Furinghetti (2003). Taking the broader perspective of the evolution of mathematical journalism, these authors proposed that the history of periodicals as a general form of scientific communication has passed through several stages. The journals, in some respects, are a bridge between educators and were affected by major historical events or changes in the political atmosphere.

The present researcher also found some features of Hungarian journals that contrast with Western European journals. Among these is the explicit ideologization of the subject, as presented in *Teaching of Mathematics*. This aspect is similar to what Karp (2007) observed in Soviet periodicals because the propaganda and ideology of *Teaching of Mathematics* followed those of the Soviet periodicals—not surprisingly because of the Soviet Union's influence on Hungary.

7.1 Answers to the Research Questions

In this primarily qualitative research, the researcher analyzed all 78 volumes of *Journal of the National Association of Secondary School Teachers*, the first periodical in Hungary dedicated specifically to secondary education, published between 1868 and 1944, as well as the first 20 issues of *Teaching of Mathematics*, the first specialized journal dedicated to primary and secondary mathematics education, published between 1953 and 1956.

Following major historical turning points in the formation of the state in Hungary, the researcher organized the analysis of the evolution of Hungarian secondary mathematics education between 1867 and 1956 into three periods: (a) 1867-1918: the Austro-Hungarian Monarchy; (b) 1918-1944: the Hungarian Republic, followed by Hungarian Kingdom without a King; and (c) 1949-1956: the Hungarian People's Republic.

The answers to the research questions that guided this study are detailed below.

1. *Which major factors affected the role and content of periodicals in Hungarian secondary mathematics education between 1867 and 1956?*

Below is the summary of the historical, political, and social factors which affected the role and content of the *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* during the three specific eras.

1868-1918: *Journal of the National Association of Secondary School Teachers*

As demonstrated in Chapter 5 (Section 5.2), the Compromise in 1867 was the first major historical event to affect the establishment of the *Journal.* The Compromise laid new foundations between Austria and Hungary. The Monarchy was a multicultural, dynamically developing, liberal bourgeois state based on a capitalist economy, where education, expertise, and professionalization played very important roles. As the result of the new era, the Hungarian educational system changed fundamentally; teachers' associations were formed and started to publish their own periodicals. The specialization of the journals began with the *Journal of the National Association of Secondary School Teachers,* established by the National Association of Secondary School Teachers in 1868. The role and content of the *Journal* was to deal with all aspects of secondary education and provided news about the life of the Association. The *Journal* also published subject-specific articles, such as different areas of mathematics. During its existence, the *Journal* published 290 articles specifically devoted to mathematics education. The majority of these articles (90%) were published during the 51 years of the Austro-Hungarian Monarchy.

In the 1870s, in the absence of a national secondary school curriculum, the main role of the *Journal* was to serve as a bridge between educators. During the time of the transformation of the school system, mathematics-related articles focused on several lively discussions about "curriculum experiments," recommendations for a common mathematical terminology, and new teaching methods.

In the early 1880s, the major social factor impacting the *Journal* was the adoption of the Secondary School Law, passed in 1883 by the Ministry of Religion and Public Education. The Law established the structure, legal status, role of the state, and teacher certification for secondary schools. The articles in the *Journal* represented the preparation and adoption of the new law; they also highlighted the introduction of new curricula, instructions for new teaching and learning methods, and the resolution of issues on teacher training.

By the turn of the 20th century, major political changes in the government and parliamentary struggles influenced the existence of the *Journal*. Attitudes were slowly changing, as reflected in the *Journal of the National Association of Secondary School Teachers*; the subjects of the articles were narrowed down to fewer didactic issues and the need to reform teaching methods.

In the early 1900s, the main social factor in the life of the *Journal* was that Hungary followed the international mathematics reform movement, initiated by David Eugene Smith (USA) and led by Felix Klein (Germany). The subjects of the mathematics articles in the *Journal* were focused on the Hungarian reform movement and the outstanding work of the Hungarian Mathematical Reform Subcommission, which had received national and international attention.

Starting in 1914, Hungary faced many political and social challenges. During World War I, the Association adapted to new circumstances: the *Journal of the National Association of Secondary School Teachers* often reported on the military services and deaths of teachers, while only one article (a book review) related to mathematics education was published in 1917.

1918-1944: *Journal of the National Association of Secondary School Teachers*

During the second period, major historical events dramatically changed the role and content of the *Journal,* as was discussed in Chapter 5 (Section 5.3). In the aftermath of World War I, Hungary became an independent state governed by short-lived leftist governments between 1918 and 1920. Then, after the Treaty of Trianon in 1920, the truncated country introduced an authoritarian regime, the Hungarian Kingdom without a King. During these turbulent historical events, education became a general interest; this shift led to the publication of a significant number of new pedagogical journals between 1920 and 1936 (see Figure 3.1 in Chapter 3). Because of the disintegration of educational forces, the role of the Association and the *Journal of the National Association of Secondary School Teachers* changed. At the general meeting of the Association in March 1920, members were excluded because of their political views or their Jewish religion. During the second era, the *Journal* published substantially fewer articles in general; there were even several years without any articles devoted to mathematics education. Between 1918 and 1944, the number of mathematics-related articles significantly decreased from 263 articles published during the first 51 years of the Austro-Hungary Monarchy to only 27 (10%) in the last 27 volumes. During the second era, the relative handful of articles concentrated on the content of mathematics teaching and teacher training.

During World War II, the existence of the Association and its journal faced extreme challenges. The last issue of the *Journal of the National Association of Secondary School Teachers* was published in December 1944. Even though the Association tried to survive after World War II, it was terminated in 1948 due to political pressures.

1953-1956*: Teaching of Mathematics*

As demonstrated in Chapter 6, in the third examined era (1953-1956), the political and social transformations taking place in Hungary brought major changes in all areas of life. After World War II, the Soviet Union took over Hungary in 1949, the Hungarian People's Republic was established, and public education underwent a radical reorganization process. The new educational ideology was aligned with the guidelines of Stalin's socialist pedagogy and the rhetoric of a Soviet Communist Party. Among the goals of socialist public education were the centralization and standardization of the journal literature. By 1950, the Hungarian Workers' Party abolished previously published pedagogical journals. In 1953, the first journal dedicated to primary and secondary mathematics education, *Teaching of Mathematics*, was established by the Ministry of Education and the Bolyai János Mathematical Society (BJMT). In 1956, the publication of the journal was interrupted after the second issue because a nationwide revolution against the Hungarian People's Republic and its Soviet-imposed policies broke out in October.

Forty-seven articles were published on secondary mathematics education in the first 20 issues between 1953 and 1956.

The role and content of the new journal was to deal with theoretical and didactic issues in mathematics, the everyday practical problems of mathematics teaching, and professional development at both the primary and secondary levels. Unlike the *Journal of the National Association of Secondary School Teachers, Teaching of Mathematics* was also of a political nature, intended to disseminate communist ideology directly in mathematics education.

In conclusion, major historical turning points in the form of the state in Hungary resulted in political and social factors which affected the role and content of *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* for the three observed periods.

2. *How did periodicals for secondary mathematics education change between 1867 and 1956?*
   a. *In content? What topics were covered during this time, and how did the topics change over time?*
   b. *In approach? How were pedagogy methods emphasized in the articles?*

The researcher classified all secondary mathematics-related articles in the *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* into the main categories of curriculum, teaching methods, school mathematics, and book/textbook reviews. Fourteen articles in *Journal of the National Association of Secondary School Teachers* and two articles in *Teaching of Mathematics* did not fit specifically named main categories and were grouped as "other." Figure 7.1 shows the distribution of the articles based on main category during the three eras.

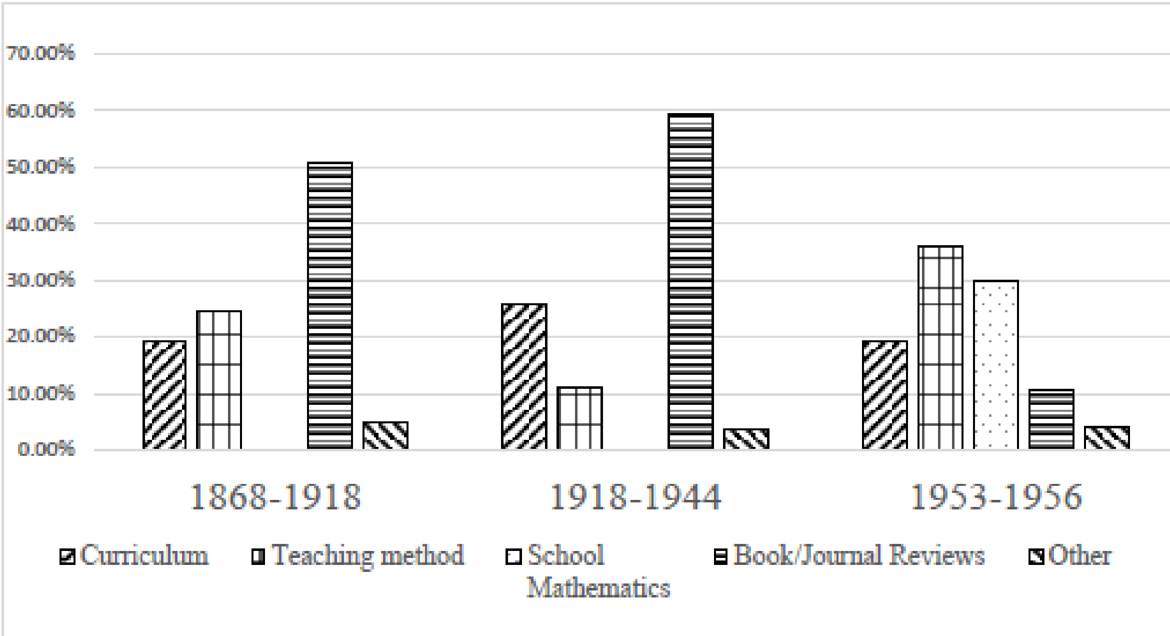

Figure 7.1: Distribution of Mathematics-Related Articles in *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* Based on Main Categories Between 1868 and 1956

Within each main category, the researcher further subcategorized the content into mathematics subject matter such as arithmetic, algebra, geometry, general, and other. Any article that introduced more than one subject (e.g., algebra and geometry together) was placed in the "general" subcategory, while any articles that did not fit specifically named subcategories were grouped as "ideology." Figure 7.2 shows the distribution of the articles based on the subcategories during the three eras.

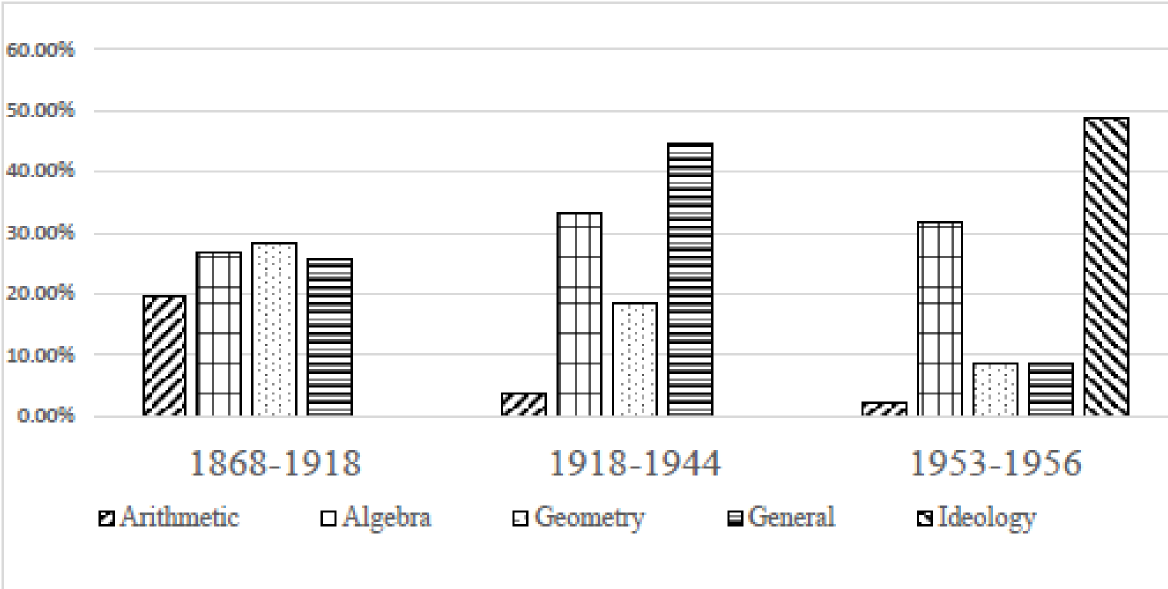

Figure 7.2: Distribution of Mathematics-Related Articles in *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* Based on Subcategories Between 1868 and 1956

Below is a summary of how the content and pedagogy approach for secondary mathematics education changed in *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* between 1867 and 1956.

<u>1868-1918: *Journal of the National Association of Secondary School Teachers*</u>

As demonstrated in Chapter 5 (Section 5.2), in the early decades of the Monarchy, the articles on curriculum and teaching methods focused on two major issues: (a) curriculum experiments and (b) common mathematical terminology. The absence of a national curriculum and an instructional method for secondary schools resulted in weak mathematics education; for example, the Hungarian maturity exam was not accepted in many European countries. To improve mathematics education, teachers constantly looked to renew and create new curricula and conducted various "curriculum experiments" in regular mathematics classes, such as arithmetic and geometry. The urge to increase students' interest in mathematics eventually resulted in adopting new teaching methods following the educational ideas of Pestalozzi, Herbart, and others. The *Journal* also published articles to expand the curriculum with new branches of mathematics such as statistics, following the lead of French and Russian mathematics educators. After the Central Statistical Office was established in 1871, Budapest hosted the 9th International Statistical Congress in 1875. The organizers of such scientific conferences aimed to make the capital, and thus Hungary, more prominent in the international public consciousness.

The other major topic of the *Journal* during this era was the lack of Hungarian as a professional language. As the country's official language became Hungarian in 1844, the technical language of several scientific fields was developed at this time or later. This process essentially lasted throughout the 19th century, and mathematics was no exception. Since communication between professionals was extremely difficult due to the lack of uniform technical terms, the development of the Hungarian mathematical language in arithmetic, geometry, and algebra was essential. Despite some improvement in this regard, this issue was still existing at the beginning of the 20th century.

In the 1880s, as the economy and civilizing society flourished, the curriculum and the 1883 Law focused on natural sciences and mathematics. The importance of the solid foundation in mathematics and physics was to pursue successful careers in higher education, and ways to combine geometry and algebra in the curriculum was introduced in several articles. In the 19th century, international influences, especially those of the curriculum from Austria and Germany, were clearly recorded in a range of articles.

From the second half of the 1880s until the early 20th century, the focus of the articles shifted toward didactic issues and the need to reform teaching methods. Following the new trends by Smith (United States) and Klein (Germany), the initiated reform included functions as the backbone of mathematics teaching and elements of differential and integral calculus in Hungarian secondary schools. Student-led instruction examined in Germany and the “laboratory method” from England and the United States were introduced in the *Journal*. Following these international reform movements, the Hungarian Mathematical Reform Commission emphasized the importance of conceptual understanding through real-life examples and hands-on activities in mathematics classes. Adopting ideas from the mathematics reform movements was so relevant that, as a result, all three editors (Alexander, Waldapfel, and Lévay) were appointed for the journal for the total of 13 years between 1891 and 1914 because they had mathematics degrees.

Between 1868 and 1918, more than half (51%) of the mathematics-related articles in the Journal were published in the section devoted to “Book and Journal Descriptions/Reviews.” During its first decade, because the national curriculum was disorganized and not unified, a large number of new domestic and foreign mathematics textbooks were introduced to help teachers become familiar with different trends in mathematics teaching and learning. After the Secondary School Law in 1883, the firm state control over textbook publication resulted in fewer numbers of new mathematics textbooks, which then indicated fewer reviews in the *Journal*. At the turn of the century, because of the reform movements, the focus of reviews shifted to higher-level mathematics content such as analysis as well as differential and integral calculus.

During the Austro-Hungarian Monarchy, the international impact on mathematics education can be observed in the *Journal of the National Association of Secondary School Teachers*. Hungarians imported modern theories and practices from abroad, mainly from Austria and Germany. About 20% of the articles in the *Journal* referred to German teaching methods and literature. In the early 20th century, following the reform movements, few articles in the journal introduced mathematics teaching from other countries such as England and the United States.

1918-1944: *Journal of the National Association of Secondary School Teachers*

World War I and the subsequent Trianon Treaty interrupted the progress of Hungarian education. After 1918, the *Journal* published substantially fewer articles. As in the previous era, about a quarter of mathematics-related articles discussed curriculum, while more than half of them introduced book and journal reviews. Of equal importance, the number of articles focused on mathematics teaching methods decreased from 25% to 11%.

During this era, the articles concentrated on two major issues: (a) the content of mathematics teaching, and (b) teacher training. Because the state gradually expanded control over educational institutions and tasks, the new curricula in the 1920s and 1930s required more space for so-called national subjects and reduced the number of hours of mathematics. As a result, critical thinking and problem-solving activities declined in secondary mathematics classes. The article authors revisited the idea recommended by the Hungarian Mathematical Reform Commission in the early 20th century to emphasize the concept of function and include higher-level mathematics such as calculus in Hungarian high schools. The works of Cantor, Hilbert, Zermelon, Perron, Leibniz, Möbius, Hamilton, and Grassmann were discussed.

The need for a new generation of teachers for the smaller country after 1920 led to educational laws in the 1920s and 1930s that regulated the training and qualifications of secondary school teachers. To improve the content and pedagogical knowledge of this new generation of teachers by introducing different branches and ways to teach mathematics, the Ministry organized uniform continuing education training courses, which were introduced in the *Journal*. Because not many opportunities were left for teachers to demonstrate independent teaching methods, this may be a reason why only three articles regarding teaching methods were published in this era.

As during the Monarchy, more than half of the articles discussed book and journal reviews between 1918 and 1944. However, unlike in the earlier period, no foreign textbooks were presented at that time. In post-Trianon Treaty Hungary, one element of the cultural policy by Klebelsberg, the Education Minister, was the assertion of so-called cultural supremacy; it is possible that nationalism played a role in the fact that only Hungarian textbook reviews were published.

1953-1956: *Teaching of Mathematics*

As demonstrated in Chapter 6, Hungary underwent significant political and educational changes because of the influence of Soviet and socialist ideologies after World War II. The distribution of the 47 articles on secondary mathematics education in *Teaching of Mathematics* shows both similarities and differences to the previous eras.

The proportion of curriculum-related articles was similar to the previous two eras (about 20%). Although formerly the content of the articles was focused on subject-specific discussions (such as arithmetic, algebra, geometry), two-thirds of the articles in this era discussed general ideological issues in the mathematics curriculum (see Figure 7.2 “ideology"). As discussed in Chapter 6 (Section 6.2), authors emphasized the importance of “polytechnic education,” dialectical materialist worldviews, political self-awareness, and education for socialist patriotism in mathematics. Only a handful of articles discussed subject-specific mathematics-related changes such as (a) teaching real-life mathematics applications with functions utilizing the work of Felix Klein and also later of the modern work of V. M. Bradis; and (b) the mathematics content in high schools which could prepare students properly for oral and written entrance examinations to attend higher education.

Similarly, in the second era, Hungary suffered from a lack of teachers and supplies that were necessary for teaching after World War II. *Teaching of Mathematics* was a suitable platform from which to educate the new generation of mathematics teachers by introducing (a) teaching methods, and (b) mathematics content.

The proportion of articles on teaching methods was the largest (36%) of the three eras, and in this era as well (see Figure 7.1). As discussed in Chapter 6 (Section 6.3), articles were aimed at helping teachers with matters of fundamental importance such as how to teach, how to liven up the lesson, and how to increase student interest. Authors discussed how to eliminate formalism—a meaningless rote memorization—from mathematics teaching practices; they emphasized regular reviews and proper assessments to educate a so-called socialist type of person. Since pre-World War II textbooks were replaced, authors recommended teaching methods from available Russian textbooks and problem collections. Additionally, articles discussed organized extracurricular activities which prepared students to participate in school-wide and country-wide mathematics competitions and counting education training courses for teachers.

The articles in *Teaching of Mathematics*—which directly educated teachers by describing mathematics concepts, proofs of theorems, or the history of mathematics—established a new category in this study called "school mathematics." About 30% of all the articles in *Teaching of Mathematics* belonged to that category (see Figure 7.1). As demonstrated in Section 6.4, authors who were both mathematicians and teachers described some secondary-level topics in algebra and geometry in different ways as well as some higher-level content such as analysis and group theory. Another aim of the school mathematics category was to teach Hungarian patriotism in mathematics classes by introducing the lives and works of famous Hungarian mathematicians and educators.

The number of book reviews in *Teaching of Mathematics* was particularly low (11%), compared to the *Journal of the National Association of Secondary School Teachers*. The reason for this is clearly ideological. Nationalization also impacted textbook publication; only new compulsory mathematics textbooks series published between 1949 and 1953 were allowed to be used in secondary schools. Apart from Hungarian books, only reviews of Soviet books were published.

In this section, the researcher discussed how major topics and pedagogy methods changed for secondary mathematics education in both *Journal of the National Association of Secondary School Teachers* and *Teaching of Mathematics* for the three observed periods between 1867 and 1956.

3. *Who were the most prominent and influential authors of the periodicals between 1867 and 1956?*

<u>1868-1944: *Journal of the National Association of Secondary School Teachers*</u>

As already mentioned in Chapter 5 (Section 5.4), the contributors—both editors and authors—to the journal formed a diverse group. The appointment of three editors who specialized in mathematics (Alexander, Waldapfel, and Lévay) aligned with the strengthening of the mathematics curriculum in Hungary. Altogether, these editors served 13 years during that 23-year period between 1891 and 1914. The relatively long editorial activity (7 years between 1907 and 1914) of Lévay—the only editor who graduated as a mathematician—seemed to coincide with the spread of international education reforms in Hungary. Whether this process justified his appointment as editor and the stability of his work, or whether, by contrast, the reforms were integrated into Hungarian research mainly due to Lévay's work, cannot be determined based on current sources.

Between 1868 and 1944, 107 distinct individuals had contributed their work on mathematics education to the journal; 64% of them published only one article while 6% contributed more than 10 articles. Only two papers were co-authored. Forty-two authors either published more than two articles or played a key role in the development of the journal and Hungarian mathematics education. Of the 107 authors appearing in the journal, 18 were also university professors and eight were members of the Hungarian Academy of Sciences.

In bourgeois Hungary after 1867, proper professional training and professionalization became increasingly important. In this spirit, in the case of these authors, it was not possible to publish articles in specialized journals without appropriate professional qualifications. In the 1870s and 1880s, in addition to practical secondary school teachers, the most prominent authors were popular textbook writers of the time (Császár, Ábel, Lutter, Mauritz); members of the National Public Education Council who played an important role in restructuring Hungarian public education (Lutter, Suppán); and two versatile university professors (Brassai, Kőnig). In the late 19th and early 20th centuries, in addition to practical secondary school teachers, the prominent members of the Hungarian Mathematical Reform Commission published several articles (Beke, Mikola, Goldziher).

As a result of the end of World War I in 1918 and the Treaty of Trianon in 1920, many Hungarian intellectuals lived outside the territory of the new, reduced Hungarian state. Many people moved away from Hungarian education, which could be a reason that the number of authors significantly decreased. Additionally, in the 1930s, Hungary moved in the direction of German orientation, and anti-Semitism became stronger in its internal politics. Due to measures and laws affecting Jews adversely, the activities of many excellent professionals were restricted; as their situation became more difficult, many chose to emigrate. As a result, Hungarian intellectual life suffered a serious loss. During the second era of the *Journal*, only five authors published more than two articles.

Of the 107 authors, 12 had earned doctorate degrees. However, this was not a condition for publication; rather, it was more important, in addition to appropriate professional qualifications, that the authors be experienced teachers and share and discuss their experiences in the columns of the *Journal*. The presence of authors with doctoral degrees, by contrast, showed the rank of the *Journal* because it was not considered degrading for those with higher academic degrees to write and be published in the *Journal of the National Association of Secondary School Teachers*.

1953-1956*: Teaching of Mathematics*

As discussed in Chapter 6 (Section 6.6), the contributors—both editor and authors—to the journal *Teaching of Mathematics* formed a diverse group. The journal had one female editor, Endréné Gádor. Based on current sources, it cannot be determined why only one editor was a woman. It can only be surmised that a working woman as a socialist model was typical of the era.

This era was characterized by an increased number of co-authored articles. Of the 47 articles, three were written by a community of authors and two were co-authored. In the case of such articles, the authors had less responsibility since the work was shared. Joint work, or working together, also fit perfectly into the prevailing socialist ideology, which emphasized that the individual does not come first; rather, all work together for the community and society as a whole by a pooling of knowledge.

Twenty-eight distinct authors had contributed their work to the journal, and more than 80% published one article. Eight authors either published more than two articles or played a key role in developing the journal and Hungarian mathematics education. Between 1953 and 1956, practical secondary teachers (Obláth), textbook authors (Hódi, Faragó, and Varga), and members of the journal's editorial board (Gádor and Surányi) published secondary school mathematics-related articles in *Teaching of Mathematics*. Arguably, the most prominent authors of the journal were János Surányi, László Faragó, and Tamás Varga, who were all part of Karácsony's circle, where they worked together with other first-rate mathematicians. Later, they played important roles in the restructuring of Hungarian public education.

One challenging issue in this current study was to identify all the publishing information of the journals. In particular, the *Journal of the National Association of Secondary School Teachers* has a lack of information in identifying the editorial board. In some volumes, only authors' initials can be identified. For both journals, information about many authors is very limited or even unavailable. Some influential authors of the mathematics education journals were involved in several other pedagogical journals devoted to other topics. To gain a deeper understanding of the true influence of these contributors to Hungarian mathematics education, more research is needed on the extent of their activities and involvement in other journals from the same time period. Another challenge of this study was the difficulty of classifying articles. Many articles contained information which could fit into more than one category. Because some articles had content related to multiple categories, the researcher used her best judgment to place the articles into the most appropriate category.

It would be of interest to compare these analyzed materials with other materials in general educational journals or in periodicals on teaching other school subjects. These and other issues deserve special studies.

7.2 Recommendations for Further Studies

One challenging issue in this current study was to identify all the publishing information of the journals. In particular, the *Journal of the National Association of Secondary School Teachers* has a lack of information in identifying the editorial board. In some volumes, only authors' initials can be identified. For both journals, information about many authors is very limited or even unavailable. Some influential authors of the mathematics education journals were involved in several other pedagogical journals devoted to other topics. To gain a deeper understanding of the true influence of these contributors to Hungarian mathematics education, more research is needed on the extent of their activities and involvement in other journals from the same time period. Another challenge of this study was the difficulty of classifying articles. Many articles contained information which could fit into more than one category. Because some articles had content related to multiple categories, the researcher used her best judgment to place the articles into the most appropriate category.

It would be of interest to compare these analyzed materials with other materials in general educational journals or in periodicals on teaching other school subjects. These and other issues deserve special studies.

One challenging issue in this current study was to identify all the publishing information of the journals. In particular, the *Journal of the National Association of Secondary School Teachers* has a lack of information in identifying the editorial board. In some volumes, only authors' initials can be identified. For both journals, information about many authors is very

limited or even unavailable. Some influential authors of the mathematics education journals were involved in several other pedagogical journals devoted to other topics. To gain a deeper understanding of the true influence of these contributors to Hungarian mathematics education, more research is needed on the extent of their activities and involvement in other journals from the same time period. Another challenge of this study was the difficulty of classifying articles. Many articles contained information which could fit into more than one category. Because some articles had content related to multiple categories, the researcher used her best judgment to place the articles into the most appropriate category.

It would be of interest to compare these analyzed materials with other materials in general educational journals or in periodicals on teaching other school subjects. These and other issues deserve special studies. New studies can continue the line of exploring the above studied journals in many different ways. The *Journal of the National Association of Secondary School Teachers* can be compared with other pedagogical journals published by other teacher associations. For example, it would be interesting to analyze the *Journal of National Civic School Teachers' Association*, published between 1876 and 1947, and see similarities and differences in its approach to mathematics education. Another new study can continue to examine *Teaching of Mathematics* for a more extensive period beyond the scope selected for this study to see how its content and influences changed throughout the years of the Cold War until 1990. The "Exercises, Solutions of Exercises" section in *Teaching of Mathematics* is worth investigating. It would be interesting to explore what types of questions where published and who were the authors of the questions and the answers to those questions. This would offer an opportunity to understand the audience of the journals better.

This study provided a chronicle of the development of periodicals in Hungary, a country with a history of dramatic events. Mathematics education periodicals represent one important side of professional communication in the field. It may be of interest to generalize the approach by applying the method of scientometrics (Nagy, 2016). The method of scientometrics means that after the journals are fully digitized, their full-text database can be organized, and their entire reference structure can be explored. One aspect of further research, then, can be an examination of the internal references of journals and their possible interlinking with other journals. This study would ideally identify connections with the publications in the periodicals, offering additional insights into our understanding of their role in the field of mathematics education.

References

Ábel, K. (1869). Folyóirat ismertetés: Zeitschrift für mathematischen und naturwissenschaftlichen Untericht Unter Mitwirkung von Fachlehrern herausgegeben J.C.V. Hoffman. [Journal review: *Journal for Mathematics and Science Teaching*. Published with the assistance of specialist teachers J. C. V. Hoffman]. *Az Országos Középtanodai Tanáregylet Közlönye*, (2), 282-285.

Ábel, K. (1870a). Könyvismertetés: Bajusz, M: Laptértan. Pozsony, 1869. [Book review: Bajusz, M: Plane geometry. Pozsony, 1869]. *Az Országos Középtanodai Tanáregylet Közlönye, 3*, 278-282.

Ábel, K. (1870b). Folyóirat ismertetés: Zeitschrift für mathematischen und naturwissenschaftlichen Untericht Unter Mitwirkung von Fachlehrern herausgegeben J.C.V. Hoffman. [Journal review: Journal for mathematics and science teaching. Published with the assistance of specialist teachers J. C. V. Hoffman]. *Az Országos Középtanodai Tanáregylet Közlönye*, (4), 669-675.

Ábel, K. (1871). Könyvismertetés: Mauritz, R.: Általános számtan és algebra. Pest, 1870. [Book review: Mauritz, R.: General arithmetic and algebra. Pest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 3*, 641-646.

Ábel, K. (1872a). Könyvismertetés: Dr. Bardey: Methodisch geordnete Aufgabensammlung. Leipzig, 1871. [Book review: Dr. Bardey: Methodically arranged collection of exercises. Leipzig, 1871]. *Az Országos Középtanodai Tanáregylet Közlönye, 5*, 411-413.

Ábel, K. (1872b). A mennyiségtani műszók érdekében. [For the sake of quantitative artificial words]. *Az Országos Középtanodai Tanáregylet Közlönye, 5*, 493-498.

Ábel, K. (1874a). Könyvismertetés: Dr. Hesse, O.: Die Determinanten elementar behandelt Autlage. 1872, Dr. Studnicka, F. J.: Einleitung in die Theorie der Determinanten für Studierende an Mittelschulen und Techniche Anstalten. Prag, 1871, Hattendorf K.: Einleitung in die Lehre, von den Determinanten. Hannover. 1874, Dr. Dölp, H.: Die Determinanten nebst Anwendung auf die Loesung algebraischer und analytisch-geometrischer Aufgaben. Darmstadt. 1874, Dr. Reidt. Fr.: Vorschule der Theorie der Deteminanten für Gymnasien und Realschuen. Leipzig. 1874. [Book review: Dr. Hesse, O.: The determinants elementary treated edition. 1872, Dr. Studnicka, F. J.: Introduction to the theory of determinants for students at secondary schools and technical institutions. Prague, 1871, Hattendorf K.: Introduction to the doctrine, of the determinants. Hanover. 1874, Dr. Dölp, H.: The determinants and their application to the solution of algebraic and analytical-geometric tasks. Darmstadt. 1874, Dr. Reidt. Fr.: Preschool of the theory of deteminants for grammar schools and secondary schools. Leipzig. 1874]. *Az Országos Középtanodai Tanáregylet Közlönye, 8*, 231-234.

Ábel, K. (1874b). A mathematika oktatás, tekintettel az új tantervre. [Mathematics education with a view to the new curriculum.]. *Az Országos Középtanodai Tanáregylet Közlönye, 8*, 247-254.

Ábel, K. (1875a). Könyvismertetés: Császár, K.: Algebra a középiskolák felsőbb osztályai számára, Budapest. 1875. [Book review: Császár, K.: Algebra for upper secondary schools, Budapest. 1875]. *Az Országos Középtanodai Tanáregylet Közlönye, 9*, 182-189.

Ábel, K. (1875b). Észrevételek a symmetriális determinansok egyik tételeinek dr. Günther közölte elemi levezetésére. [Observations on one of the theorems of symmetric determinants communicated by dr. Günther.]. *Az Országos Középtanodai Tanáregylet Közlönye*, *9*, 234-239.

Albert, G. B. (2011). *A nevelés történeti és elméleti alapjai*. [Historical and theoretical foundations of education.]. Kaposvári Egyetem.

Albree, J., & Brown, S. H. (2009). "A valuable monument of mathematical genius": The *Ladies' Diary* (1704–1840). *Historia Mathematica, 36*(1), 10-47.

Ausejo, E., & Hormigâon, M. (Eds.). (1993). *Messengers of mathematics: European mathematical journals (1800-1946)* (1st ed.). Madrid: Siglo XXI.

Bajusz, M. (1870). Három tértani axiómáról. [On three spatial axioms]. *Az Országos Középtanodai Tanáregylet Közlönye*, *3*, 371-376.

Balogh, M. (1892). Könyvismertetés: Beke M: Számtan a középiskolák alsó osztályai számára. Budapest, 1892. [Book review: Beke M: Arithmetic for the lower grades of high schools. Budapest, 1892.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 26*, 289-292.

Baranyai, M., & Keleti, A. (1937). *A magyar nevelésügyi folyóiratok bibliográfiája 1841–1936*. [Bibliography of Hungarian educational journals 1841–1936.]. Budapest Székesfőváros Házinyomdája, Budapest.

Baló, G. (1883). Az irrationális szám ismertetése az V. osztályban. [Description of the irrational number in 5th grade.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *17*, 232-236.

Barcsa, J. (1903). A nyelvtani és matematikai műszók egységéről. [On the unity of grammatical and mathematical terms.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 37*, 398-400.

Bede, L. (1953). A Borsod megyei matematikusok szakmai tanácskozása. [Professional meeting of mathematicians from Borsod county.]. *A Matematika Tanítása, 1*, 60-64.

Beke, M. (1883). A másodrendű görbék egyenleteinek jellegéről. [On the nature of the equations of second-order curves.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *17*, 519-521.

Beke, M. (1885). Könyvismertetés: Kőnig, Gy.: Analízis-bevezetés a mathematika rendszerébe. [Book review Kőnig, Gy.: Introduction of analysis to the system of mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 19*, 241-246.

Beke, M. (1887a). Könyvismertetés: Kőnig, Gy.: Analízis-bevezetés a mathematika rendszerébe. [Book review Kőnig, Gy.: Introduction of analysis to the system of mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 20*, 733-739.

Beke, M. (1887b). A számtani oktatás kérdéséhez. [To the question of mathematics education.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 21*, 83-95.

Beke, M. (1887c). Könyvismertetés: Suppán V: Számtan. 2nd bővitett kiadás. Budapest, 1887. [Book review: Suppán V: Arithmetic. 2nd revised edition. Budapest, 1887.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 21*, 242-244.

Beke, M. (1891a). A kör kerülete. [The perimeter of the circle.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 211-212.

Beke, M. (1891b). Mathematikai és Physikai Lapok. [Journal of Mathematics and Physics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 214- 216.

Beke, M. (1891c). Mathematika. [Mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 767-770.

Beke, M. (1906). A mathematika tanítás reformja. [Reform of the mathematics teaching.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 40*, 90-96.

Beke, M., & Mikola, S. (1913). Felhívás a matematika tanáraihoz. [A call to mathematics teachers.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 47*, 175-177.

Bogyó, S. (1888). Könyvismertetés: Havas M: Kereskedelmi és politikai számtan. Pozsony, 1888. [Book review: Havas M: Commercial and political arithmetic. Pozsony, 1888.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 22*, 307-309.

Bogyó, S. (1890). Könyvismertetés: Dr. Beke, M.: Algebra kereskedelmi akadémiák és közép kereskedelmi iskolák számára. Budapest. 1890. [Book review: Dr. Beke, M.: Algebra for commercial academies and middle commercial schools. Budapest. 1890.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 24*, 257-259.

Bori, I. (1955). A szóbeli számolás jelentősége a középiskolai matematikatanításban. [The importance of oral counting in secondary mathematics education.]. *A Matematika Tanítása, 3*, 76-80.

Borsodi, C., & Tüskés, A. (2010). *Az Eötvös Loránd Tudományegyetem Bölcsészettudományi Karának története képekben 1635–2010*. [History of the Faculty of Arts of Eötvös Loránd University in pictures 1635–2010.]. Eötvös Loránd Tudományegyetem, Bölcsészettudományi Kar.

Bozóky, E. (1892). Az ábrzázoló geometria az egységes középiskolában. [Representative geometry in uniform high school]. *Az Országos Középiskolai Tanáregyesület Közlönye, 26*, 103-113.

Bozóky, E. (1896). Könyvismertetés: Horneschik, H.: A kinematikai geometria alapvonalai. Budapest. 1895. [Book review: Horneschik, H.: Basics of Kinematic Geometry. Budapest. 1895.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 30,* 719-720.

Bődy, P. (2017). *Science policies in Hungary (1867-1910) and the first generation of distinguished scientists*. LIT Verlag, Zürich.

Brassai, S. (1870). Könyvismertetés: Schröder, K.: Vezérfonal a mértani szabadkézi rajz tanításánál. Pest. 1870. [Book review: Schröder, K.: A guiding thread in the teaching of geometric freehand drawing. Pest. 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 3,* 388-397.

Brassai, S. (1878). Számtani műszavak. [Arithmetic terms.]. *Az Országos Középtanodai Tanáregylet Közlönye, 12,* 553-563.

Brassai, S. (1896). A mathematikai kifejezésekről. [About mathematical terms.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 30*, 250-253.

Budapesti Pedagógus Továbbképző Intézet Matematikai Tanszéke. (1953). A matematikatanítás tapasztalatai. [Department of Mathematics, Budapest Teacher Training Institute: Experiences in teaching mathematics.]. *A Matematika Tanítása, 1,* 3-8.

Budapesti Eötvös Gimnázium Szakmai Munkaközössége. (1953). II. Éveleji ismétlés a gimnázium I. osztályában. [Budapest Eötvös Gimnázium Professional Working Community: Review at the beginning of the school year (high school).]. *A Matematika Tanítása, 1*, 12-15.

Bukovszky, F. (1942). Mennyiségtani továbbképző tanfolyam. [Quantitative training course.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 76*), 105-106.

Bukovszky, F. (1943). Kézi pergőképek a mennyiségtan tanításában. [Flip books in mathematics teaching.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 77,* 30-33.

Cajori, F. (1890). *The teaching and history of mathematics in the United States*. Government Printing Office.

Christensen, S. A. (1895). *Matematikkens udvikling i Danmark og Norge i det 18. Aarhundrede, en matematisk-historisk undersøgelse*. [The development of mathematics in Denmark and Norway in the 18th century, a mathematical-historical study.]. Odense.

Connelly, J. (2010). *A tradition of excellence transitions to the 21st century: Hungarian mathematics education, 1988-2008*. Doctoral dissertation, Teachers College, Columbia University.

Costa, S. A. (2000). *The "Ladies' Diary": Society, gender and mathematics in England, 1704-1754*. Doctoral dissertation, Cornell University.

Crilly, T. (2004). The *Cambridge Mathematical Journal* and its descendants: The linchpin of a research community in the early and mid-Victorian Age. *Historia Mathematica, 31*(4), 455-497.

Csánk, I. (1953). Két új középiskolás matematika tankönyv. Könyvismertetés: Fiala, A., Hursán, P., Csánk, I.: Matematika a gimnáziumok I. Osztálya számára. Budapest, Gyarmathi, L., Rapcsák, A., Török, S.: Matematika az ipari technikumok számára. Budapest. [Two new high school math textbooks. Book review: Fiala, A., Hursán, P., Csánk, I.: Mathematics for the 1st class of grammar schools. Budapest., Gyarmathi, L., Rapcsák, A., Török, S.: Mathematics for industrial technical schools. Budapest.]. *A Matematika Tanítása, 1,* 84-86.

Csánk, I. (1955). Milyenek legyenek a matematikai tankönyvek? [What should mathematics textbooks look like?]. *A Matematika Tanítása, 3*, 114-117.

Császár, Á. (2004). A társulatról-külföldieknek. [About the company—for foreigners.]. *Matematikai Lapok, 12*(2), 1-5.

Császár, K. (1870). A mennyiségtani oktatás hiányának okai. [Reasons for the lack of quantitative education]. *Az Országos Középtanodai Tanáregylet Közlönye, 3,* 236-244.

Császár, K. (1873). A számtan oktatásához. [To teach arithmetic.]. *Az Országos Középtanodai Tanáregylet Közlönye, 7*, 71-82.

Császár, K. (1874). Könyvismertetés: Dr. Weisz J.: A sokszögtan továbbfejtése. Budapest. 1874. [Book review: Dr. J. Weisz: Further development of polygonism. Budapest. 1874.]. *Az Országos Középtanodai Tanáregylet Közlönye, 7,* 390-393.

Császár, K. (1875). A Gauss-féle logarithmusok a középiskolai oktatásban. [Gaussian logarithms in secondary education.] *Az Országos Középtanodai Tanáregylet Közlönye, 9,* 212-218.

Császár, K. (1876). A geometriai díszítményekről. [About geometric ornaments.] *Az Országos Középtanodai Tanáregylet Közlönye, 10,* 134-137.

Császár, K. (1877a). Könyvismertetés: Kőnig, Gy.: Bevezetés a felsőbb algebrába. Budapest, 1877. [Book review: Kőnig, Gy.: Introduction to higher algebra. Budapest, 1877.]. *Az Országos Középtanodai Tanáregylet Közlönye, 10*, 272-275.

Császár, K. (1877b). A mathematikai műszók érdekében. [For mathematical terms.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 107-111.

Császár, K. (1877c). A hatványozás és gyökérvonás a középiskolák alsó osztályaiban. [Exponentiation and root counting in the lower grades of high schools.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 421-429.

Császár, K. (1878a). Könyvismertetés: Bartl, E.: Einleitung in die Theorie der Determinanten. Prága, 1878. [Book review Bartl, E.: Introduction to the theory of determinants. Prága, 1878.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 247-248.

Császár, K. (1878b). Könyvismertetés: Kriesz, F.: Szerkesztő síkmértan-kapcsolatban a földmérés egyszerűbb tételeivel. Budapest, 1878. [Book review: Kriesz, F.: Editorial planar geometry—in connection with simpler theorems of surveying. Budapest, 1878.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 624-626.

Császár, K. (1878c). Rajz, geometriai oktatás. [Drawing, geometric education.]. *Az Országos Középtanodai Tanáregylet Közlönye, 12*, 302- 304.

Császár, K. (1878d). Az ábrázoló geometria fontosabb műszói. [The most important words in descriptive geometry.]. *Az Országos Középtanodai Tanáregylet Közlönye, 12*, 325-328.

Császár, K. (1879a). Könyvismertetés: Krisz F.: Szerkesztő síkmértan. Budapest, 1879. [Book review: Krisz F.: Editorial plane geometry. Budapest, 1879.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 12*, 116-119.

Császár, K. (1879b). Könyvismertetés: Kőnig, Gy.: Algebra a középtanodák felsőbb osztályai számára az új gymnasiumi tanterv értelmében. Budapest, 1879. [Book review: Kőnig, Gy.: Algebra for the upper classes of secondary schools according to the new gymnasium curriculum. Budapest, 1879.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 13*, 116-121.

Császár, K. (1884). A reáliskolai utasítások tervezetéről: Mathematika [About the draft real school instructions: Mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 18*, 389-394.

Czehe Gy. (1879). Könyvismertetés: Szabó, I.: Szemléltető alaktan a középiskolák alsó osztályai számára. Budapest, 1878. [Book review: Szabó, I.: Illustrative morphology for the lower grades of secondary schools. Budapest, 1878.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 12*, 245-250.

Czógler, A. (1892). Infinitesimalis elemek a középiskolai okatásban. [Infinitesimal elements in secondary education]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *26,* 598-603.

Dahlin, J. (1897). *Uppränning till matematikens historia i Finland. Från äldsta tider till Stora Ofreden*. [Learning about the history of mathematics in Finland. From the earliest times to the Great Atrocity.]. Nikolaistad: Wasa Tryckeri-Aktiebolag.

Dabkowska, E. (2019). *Polish mathematics education periodicals from 1930 to 1950*. Doctoral dissertation, Teachers College, Columbia University.

Demeczky, M. (1888). Középiskolai mathematika-tanításunkhoz. [For our high school mathematics teaching.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 22*, 437-445.

Demeczky, M. (1889). A mathematika methodikájához. [To the methodology of mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 23*, 459-462.

Demeczky, M. (1892). Könyvismertetés: Dr. Fodor, L: Az ábrázoló geometria elemei a gymnáziumok 7. és 8. osztálya számára. Budapest. 1892. [Book review: Dr. Fodor, L: Elements of Representative Geometry for Grades 7 and 8 Gymnasiums. Budapest. 1892.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 745- 746.

Despeaux, S. E. (2002). *The development of a publication community: Nineteenth century mathematics in British scientific journals*. Ph.D. Dissertation. University of Virginia, Charlottesville, VA.

Despeaux, S. E. (2007). Launching mathematical research without a formal mandate: The role of university-affiliated journals in Britain, 1837–1870. *Historia Mathematica, 34*(1), 89-106.

Despeaux, S. E. (2008). Mathematics sent across the Channel and the Atlantic: British mathematical contributions to European and American scientific journals, 1835-1900. *Annals of Science, 65*(1), 73-99.

Domokos, J. (1871). Miként kell egy oly teljes köbből a köbgyököt kivonni, melynek gyöke három jegyű szám? [How to find a cube root from a whole number whose root is a three-digit number?]. *Az Országos Középtanodai Tanáregylet Közlönye, 4*, 86-88.

Dux, E. (1956). Néhány szempont a nemnegativ számpár középértékeinek tanításához. [Some considerations for teaching the means of a non-negative number of pair.]. *A Matematika Tanítása, 4*, 12-16.

Éberling, J. (1875). Könyvismertetés: Dr. Lutter Nándor: A mennyiségtan elemei. 3-dik kiadás. Budapest, 1875. [Book review: Dr. Nándor Lutter: Elements of arithmetic. 3rd ed Budapest, 1875.]. *Az Országos Középtanodai Tanáregylet Közlönye, 5*, 160-164.

Éberling, J. (1877). Könyvismertetés: Császár, K.: Geometria a középiskolák felsőbb osztályai számára. Budapest, 1877. [Book review: Császár, K.: Geometry for upper secondary schools. Budapest, 1877.]. *Az Országos Középtanodai Tanáregylet Közlönye, 10*, 328-338.

Erdős, L. (1929). Könyvismertetés: Kürschák, J.: Mathematikai versenytételek. Megoldásokkal és jegyzetekkel. [Book review: Kürschák, J.: Mathematical competition theorems. With solutions and notes.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 63*, 203-205.

Estók, J. (1998). *A boldog békeidők* (Vol. 20). [Happy times of peace.]. Magyar Könyvklub-Officina Nova Kv.

Faragó, A. (1905). A trigonometria tanításához. [To teach trigonometry.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 39*, 364- 367.

Faragó, L. (1954). A IV. osztályos függvénytani anyag tanításának előkészítése a gimnázium három első osztályában. [Preparation for the teaching of 4th grade function material in the first three grades of high school.]. *A Matematika Tanítása, 2*, 8-15.

Faragó, L. (1955). A folyamatos ismétlés a középiskolában. [Continuous repetition in high school.]. *A Matematika Tanítása, 3,* 71-75.

Faragó, L. (1956). Az új I. gimnáziumi matematika -tankönyv geometriai részéről. [On the geometric part of the new mathematics textbook for 1st grade gymnasium.]. *A Matematika Tanítása, 4*, 21-24.

Ferenczy, J. (1883). Közoktatási szemle: Reáliskolai tanterv. [Public Education Review: Real School Curriculum.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 17*, 423-434.

Fináczy, E. (1896). *A Magyarországi középiskolák múltja és jelene*. [The past and present of Hungarian secondary schools.]. Hornyánszky Viktor Könyvnyomdája, Budapest.

Fisch, J. (1843). Der Unterricht in der Mathematik am hiesigen Gymnasium vom J. 1800 bis auf unsere Zeit. [Mathematics lessons at the local grammar school from 1800 to our time.]. In *Zur zweiten Säcularfeier des Königl. Laurentianums zu Arnsberg* (pp. 53-58). Arnsberg.

Földesi, M., Szerencsés, K., & Dabasi, A. (1998). *A rebellis tartomány*. [The rebellious province.]. Magyar Könyvklub.

Frank, T. (2004). *George Pólya and the heuristic tradition.* Berlin: Max-Planck-Institut für Wissenschaftsgeschichte.

Frank, T. (2012). Teaching and learning science in Hungary, 1867-1945: Schools, personalities, influences. *Science and Education, 21*(3), 355-380.

Fridrik, D. (1871). Könyvismertetés: Dr. Lutter Nándor: A mennyiségtan elemei-Közönséges számtan 1-4. Budapest, 1870. [Book review: Dr. Nándor Lutter: Elements of arithmetic-Ordinary Arithmetic 1-4. Budapest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 5*, 160-164.

Fried, K. (2010). Case of Hungary. In A. Karp & B. Vogeli (Eds.), *Russian mathematics education: History and world significance* (pp. 338-346). World Scientific Publishing.

Furinghetti, F. (2003). Mathematical instruction in an international perspective: The contribution of the journal *L'enseignement Mathématique*. In D. Coray & F. Furinghetti (Eds.), *One hundred years of* L'Enseignement mathématique*: Moments of mathematics education in the twentieth century* (pp. 19-46). Geneva: L'Enseignement Mathématique.

Furinghetti, F. (2009). The evolution of the journal *L'Enseignement mathématique* from its initial aims to new trends. In B. Bjarnadóttir, F. Furinghetti, & G. Schubring (2013), *"Dig where you stand": Proceedings of the Conference on Ongoing Research in the History of Mathematics Education* (pp. 31-46). Reykjavik.

Gádor, E. (1956). A középiskolai matematika szakfelügyelők tanfolyamáról. [About the course for high school mathematics supervisors.]. *A Matematika Tanítása, 3,* 139-143.

Gáspár, G. (1953). A középiskolai és egyetemi matematikai oktatás közti átmenet kérdésével foglalkozó ankét. [Conference on the issue of the transition between secondary and university mathematics education.]. *A Matematika Tanítása, 1*, 58-60.

Giacardi, L. (2010). The Italian school of algebraic geometry and mathematics teaching: Methods, teacher training, and curricular reforms in the early twentieth century. *International Journal for the History of Mathematics Education, 5*(1), 1-20.

Goldziher, K. (1904). Könyvismertetés: Rácz, L.: Matematikai gyakorlókönyv. A Középiskolai Matematikai Lapok tíz ávfolyamában megjelent feladatok gyűjteménye. Budapest. 1904 és 1905. [Book review: Rácz, L.: Mathematical exercise book. A collection of problems published in ten editions of the *Journal for High School Mathematics*. Budapest. 1904 és 1905]. *Az Országos Középiskolai Tanáregyesület Közlönye, 38*, 127-129.

Goldziher, K. (1905). A számtan tanításának tárgyi körei. [Subject areas of teaching arithmetic.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 39*, 591-593.

Goldziher, K. (1907a). A mathematikai laboratóriumról. [About the mathematics laboratory.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 41*, 90-96.

Goldziher, K. (1907b). Grafikai módszerek a számtani oktatásban. [Graphic methods in arithmetic education.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 41*, 770-776.

Goldziher, K. (1917). Könyvismertetés: Abonyi, J.: A közönséges trigonometrikus számok ötjegyű logaritmusai, antilogaritmusok és egyéb táblázatok. Budapest. 1915. [Book review: Abonyi, J.: Five-digit logarithms, antilogarithms, and other tables of ordinary trigonometric numbers. Budapest. 1915.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 51*, 691-692.

Goldziher, K. (1924). Könyvismertetés: Oltay, K.: Logarithmuskönyv négy számjeggyel. Budapest. 1924. [Book review: Oltay, K.: A book of logarithms with four digits. Budapest. 1924.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 58*, 260-261.

Gömböcz, L. (1954). Betűegyütthatós egyenletek tanításáról. [On teaching letter coefficient equations.]. *A Matematika Tanítása, 2*, 69-75.

Gosztonyi, K. (2016). Mathematical culture and mathematics education in Hungary in the XXth century. In B. Larvor (Ed.), *Mathematical cultures* (pp. 71-89). Springer International.

Gulyás, P. (1990). *Magyar írók: élete és munkái: új sorozat*. [Hungarian writers: their lives and works: new series.].Magyar Tudományos Akadémia.

Gúta, J. (1892). Könyvismertetés: Suppán V: Számtan. 3rd kiadás. Budapest, 1892. [Book review: Suppán V: Arithmetic. 3rd edition. Budapest, 1892.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 26*, 292-293.

Gyarmathy, L. (1941). Térszemléleti oktatásaz új gimnáziumban. [Spatial education in the new gymnasiums.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 75*, 231-235.

Habán, M. (1909). Könyvismertetés: Beke, M. & Mikola, S.: A középiskolai matematikai tanítás reformja. Budapest, 1909. [Book review: Beke, M. & Mikola, S.: Reform of high school mathematics teaching. Budapest, 1909.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 43*, 149-153.

Hajnal, I. (1992). 125 éves évforduló-Emlékezés az Országos Középiskolai Tanáregyesületre. [125th Anniversary-Commemoration of the National High School Teachers Association.]. *Magyar Pedagógia, 92*(3), 223-237.

Halász, G. (Ed.). (2001). *The development of Hungarian educational system*. Council of Europe Press.

Halász, G., & Council of Europe. (1998). *Secondary education in Hungary*. Council of Europe Press.

Hanna, G. (2003). Journals of mathematics education, 1900-2000. In D. Coray & F. Furinghetti (Eds.), *One hundred years of* L'Enseignement mathématique*: Moments of mathematics education in the twentieth century* (pp. 67-84). Geneva: L'Enseignement Mathématique.

Havas, G. (1954). Számonkérés a matematika órákon. [Accountibility in mathematics classes.]. *A Matematika Tanítása, 2*, 33-36.

Heinrich, G. (1870). Könyvismertetés: Berecz, A: A mennyiségtani földrajz alapvonalai, Pest, 1870. Lutter, J.: Az általános természettani földrajz alapvonalai, Pest, 1870. Berecz. A: A különleges természettani földraz alapvonalai. Pest, 1870. [Book review: Berecz, A: Basics of quantitative geography. Pest, 1870. Lutter, J.: Basics of General Natural Geography, Pest, 1870. Berecz. A: Basics of special natural geography. Pest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 3,* 320-325.

Heller, Á. (1877). A mennyiségtani levezetések szerepe a középiskolai természettani oktatásban. [The role of quantitative derivations in secondary science education.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 417-421.

Hódi, E. (1953). Egyenletek közelítő megoldása. [Approximate solution of equations.]. *A Matematika Tanítása, 1*, 113-119, 143-147, 174-183.

Hódi, E. (1954). A feladatmegoldások szerepe a formalizmus elleni küzdelemben. [The role of problem solving in the fight against formalism.]. *A Matematika Tanítása, 2*, 101-109.

Hódi, E. (1955a). A húrnégyszögekről. [About cyclic quadrilateral.]. *A Matematika Tanítása*, *3*, 80-85, 105-114.

Hódi, E. (1955b). A trigonometria néhány előnyös alkalmazása. [Some preferred applications of trigonometry.]. *A Matematika Tanítása, 3,* 168-183.

Hódi, E. (1956). Két változós másodfokú polinomok tényezőre bontásáról. [Factoring of two variable quadratic polynomials.]. *A Matematika Tanítása, 4,* 42-49.

Hornischek, H. (1891a). Könyvismertetés: Kiss, E. J.: Constructiv planimetria a reáliskoláknak 3. és 4. osztálya számára. Budapest. 1891. [Book review: Kiss, E. J.: Constructive planimetry for 3rd and 4th grades of real schools. Budapest. 1891.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 24,* 482-484.

Hornischek, H. (1891b). Ábrázoló geometria. [Descriptive geometry.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 826-828.

Hornischek, H. (1892). Könyvismertetés: Kiss, E. J.: Gyakorlati ábrázoló geometria a reáliskolák 5. osztálya számára. Budapest. 1892. [Book review: Kiss, E. J.: Practical descriptive geometry for the 5th grade of real schools. Budapest. 1892.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 25*, 683-686.

Horváth, M. (1877). Hibás műszók és germinismusok az arithmetikában. [Incorrect words and germinisms in arithmetic.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 304-306.

Howell, M. C., & Prevenier, W. (2001). *From reliable sources: An introduction to historical methods*. Cornell University Press.

Howson, G. (1982). *A history of mathematics education in England*. Cambridge University Press.

Jackson, L. L. (1906). *The educational significance of sixteenth century arithmetic from the point of view of the present time*. Doctoral dissertation, Teachers College, Columbia University.

Jáki, L. (1962). *A magyar nevelésügyi folyóiratok bibliográfiája, 1937-1958*. [Bibliography of Hungarian educational journals, 1937-1958.]. Országos Pedagógiai Könyvtár, Budapest.

Jänicke, E. (1888). Geschichte des Rechenunterrichts. [History of arithmetic instruction.]. *In Geschichte der Methodik des deutschen Volksschulunterrichts, Band 3,* ed. Karl Kehr, 1-180. Gotha: C. F. Thienemann.

Jelitai, J. (1935). Könyvismertetés: Szász, P.: A differenciál-és integrálszámítás elemei. Budapest. 1935. [Book review: Szász, P.: Elements of differential and integral calculus. Budapest. 1935.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 69*, 411-413.

Jelitai, J. (1936a). Matematikus-kongresszus Oslóban. [Mathematical Congress in Oslo.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 70*, 57-59.

Jelitai, J. (1936b). Könyvismertetés: Dávid, L.: Gyakorlati differenciálgeometria. I. kötet-síkgörbék. Budapest. 1935. [Book review: Dávid, L.: Practical differential geometry. Volume I-plane curves. Budapest. 1935.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 70*, 266-267.

Jones, P. S., & Coxford. A. (Eds.). (1970). *A history of mathematics education in the United States and Canada*: *NCTM yearbook*. National Council of Teachers of Mathematics.

Juhász, E. (1954). A számonkérés mint a tudás mélyítésének eszköze a matematika tanításában. [Knowledge check as deepening knowledge in the teaching of mathematics.]. *A Matematika Tanítása, 2*, 67-69.

Jushkevich, A. P. (1947-1948). Matematika i ee prepodavanie v Rossii v XVII–XIX vekakh [Mathematics and mathematics education in Russia in XVII–XIX centuries]. *Matematika v shkole,* 1947: 1-6; 1948: 1-3.

Kalmár, L. (1953). Az analízis módszerei a középiskolai tanításban. [Methods of analysis in secondary school teaching.]. *A Matematika Tanítása, 1*, 22-32, 74-79, 109-112.

Kardos, J. (2007). *Iskola a politika sodrásában 1945-1993*. [School in the drift of politics 1945-1993.]. Gondolat Kiadó.

Kardos, L. I. (1931). *Education in Hungary before and after the World War*. Master's Thesis, University of Southern California.

Karp, A. (2007). The cold war in the Soviet school: A case study of mathematics. *European Education, 38*(4), 23-43.

Karp, A., & Furinghetti, F. (2016) *History of mathematics teaching and learning achievements, problems, prospects.* Springer.

Karp, A., & Schubring, G. (2014). *Handbook on the history of /mathematics education*. Springer.

Karp, A. P., & Vogeli, B. R. (2011). *Russian mathematics education: Programs and practices* (Vol. 4). World Scientific Publishing.

Katona, G. (2012). Tudóstanárra emlékezünk: Búcsú Reiman Istvántól. [We remember a science teacher: Farewell to István Reiman.]. *Természettudományi Közlöny-Természet Világa, 143*(9).

Keller, M. (2007). Tanárok, egyesületek, államok. A középiskolai tanárok professzionali-zációjának kezdete porosz–magyar összehasonlításban. [Teachers, associations, states. The beginning of the professionalization of secondary school teachers in Prussian-Hungarian comparison.]. *Korall-Társadalomtörténeti folyóirat, 28-29*, 59-87.

Kenyeres, Á. (2001). *Magyar Életrajzi Lexikon 1000–1990*. [Hungarian biographical lexicon 1000–1990.]. Arcanum Adatbázis Kft., Budapest. https://mek.oszk.hu/00300/00355/html/index.html (3.13.2020)

Késedi, F., & Varga, T. (1954). Milyenek legyenek a matematikai tankönyvek? [What should math textbooks look like?]. *A Matematika Tanítása, 2*, 76-80.

Késedi, F. (1955). A budapesti általános gimnáziumokban látogatott matematikai órák tapasztalataiból. [From the experience of visiting mathematics classes in general gumnasiums in Budapest.]. *A Matematika Tanítása, 3*, 136-139.

Kiss, Á. (1881). *A magyar népiskolai tanítás története*. [*The history of Hungarian folk school teaching*.]. Franklin, Budapest.

Kiss, E. J. (1885). Adatok a stereographicus proiectio tanításához. [Data for teaching stereographic projection.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 19*, 284-289.

Klein, F. (1904). 100 Jahre mathematischer Unterricht an den deutschen höheren Schulen. In F. Klein & E. Riecke (Eds.), *Neue Beiträge zur Fragedes mathematischen und physikalischen Unterrichts* (63-77). 100 years of mathematical instruction at German secondary schools. In F. Klein & E. Riecke (Eds.), New contributions to the question of mathematical and physical education. Leipzig: Teubner.

Kornis, G. (1932). *Education in Hungary*. Teachers College, Columbia University.

Kornis, G. (1934). A matematikai tanfolyam megnyitása. [Opening a math course.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, 68, 37-38.

Kozma, P. (1954). Egy szakkör munkájáról. [About a professional circle.]. *A Matematika Tanítása, 2*, 15-17.

Kőnig, G. (1880). Néhány szó a gymnásiumi. tantervről, Algebrámról és dr. Lutter Nándor úr bírálatáról. [A few words about gymnasium. curriculum, Algebra, and dr. On the criticism of Mr Lutter Nándor]. *Az Országos Középtanodai Tanáregylet Közlönye, 10*, 545-549.

Kőváry, L. (1897). Brassai százéves pályafutása. [Brassai's hundred-year career.]. *Erdélyi Múzeum, 16*, 349-336.

Központi Pedagógus Továbbképző Intézet Matematikai Tanszéke. (1953). A matematikai továbbképzés helyzete. [Department of Mathematics, Central Teacher Training Institute: The situation of mathematics training.]. *A Matematika Tanítása, 1*, 161-162.

Kreybig, L. (1874). Észrevételek Porszász József Úr: A mérten és mértani rajzolás tanítás középiskoláinkban czímű értekezésére. [Comments József Porszász for his dissertation entitled Teaching in Measurement and Geometric Drawing in Our Secondary Schools]. *Az Országos Középtanodai Tanáregylet Közlönye, 8*, 255-259.

Landau, A. (1876). A mértan és a szabadkézi rajz a középiskola első osztályában. [Geometry and freehand drawing in the first grade of high school.]. *Az Országos Középtanodai Tanáregylet Közlönye, 10*, 293-300.

László, I. (1902). A számtantanításról. [About arithmetic.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 36*, 685-690.

László, I. (1903). Könyvismertetés: Rátz, L.: Matematikai gyakorlókönyv. A Középiskolai Matematikai Lapok tíz ávfolyamában megjelent feladatok gyűjteménye. Budapest. [Book review: Rácz, L.: Mathematical exercise book. A collection of problems published in ten editions of the *Journal for High School Mathematics*. Budapest.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 37*, 124-126.

Lewin, J. (1875). Az idomszámok egyszerű tárgyalásáról. [For easy presentation of profile numbers.]. *Az Országos Középtanodai Tanáregylet Közlönye, 9*, 393-403.

Ligeti, B. (1954). 170 éves az első magyar nyelvű algebra. [The first Hungarian algebra is 170 years old.]. *A Matematika Tanítása, 2*, 80-83.

Loczka, L. (1928). Az amerikai középiskolák főbb tantárgyainak anyaga. [Material for major subjects in American high schools.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 62*, 266-271.

Lorey, W. (1911). *Staatsprüfung und praktische Ausbildung der Mathematiker an den höheren Schulen in Preußenund einigen norddeutschen Staaten*. [State examination and practical training for mathematicians at secondary schools in Prussia and some northern German states.]. Leipzig/Berlin: Teubner.

Lorey, W. (1916). *Das Studium der Mathematik an den deutschen Universitäten seit Anfang des 19. Jahrhunderts*. [The study of mathematics at German universities since the beginning of the 19th century.]. Leipzig/Berlin: Teubner.

Lutter, N. (1874a). Ellenbírálat-A mathematika oktatás, tekintettel az új tantervre. [Counterclaim-Mathematics education with a view to the new curriculum]. *Az Országos Középtanodai Tanáregylet Közlönye, 8*, 403-413.

Lutter, N. (1874b). A mennyiségtan a poroszországi gimnáziumokban. [Arithmetic in Prussian high schools.]. *Az Országos Középtanodai Tanáregylet Közlönye, 8*, 482-485.

Lutter, N. (1880). Könyvismertetés: Kőnig, G.: Algebra a középtanodák felsőbb osztályai számára az új gymnasiumi tanterv értelmében. Budapest, 1879. [Book review: Kőnig, G.: Algebra for the upper classes of secondary schools according to the new gymnasium curriculum. Budapest, 1879.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 14*, 386-393.

Manger, E. (1934). Beszámoló a budapesti országos középiskolai tanárképző intézet matematikai továbbképző tanfolyamáról. [Report on the mathematics in-service training course of the National Secondary School Teacher Training Institute in Budapest.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 68*, 166-172.

Marót, R. (1953). Hogyan tanulja a tanuló a matematikát? [How does a student learn mathematics?]. *A Matematika Tanítása, 1*, 105-106.

Maróthi, F. (1943). Könyvismertetés: Zágoni-Barra Gy.: A mennyiségtan tanítása. Debrecen. 1943. [Book review: Zágoni-Barra Gy.: Teaching quantity theory. Debrecen. 1943.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 77*, 256-258.

Mauritz, R. (1870). Könyvismertetés: Bajusz, M: Laptértan. Pozsony, 1869. [Book review: Bajusz, M: Plane geometry. Pozsony, 1869]. *Az Országos Középtanodai Tanáregylet Közlönye, 3,* 142-144.

Mauritz, R. (1871). Könyvismertetés: Dr. Lutter Nándor: A mennyiségtan elemei-Közönséges számtan 1-4. Budapest, 1870. [Book review: Dr. Nándor Lutter: Elements of arithmetic-Ordinary Arithmetic 1-4. Budapest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 5*, 157-160.

Mauritz, R. (1872). Könyvismertetés: Frischauf J. dr.: Lehrbuch der allgemeiner Arithmetik, Eiṇleituṇg in die analytische Geometrie, Elemente, der Geometrie, Die geometrischen Constructionene. Grác. 1869. [Book review: Frischauf J. dr.: Textbook of general arithmetic, introduction to analytical geometry, elements, geometry, the geometrical constructions. Grác. 1869.]. *Az Országos Középtanodai Tanáregylet Közlönye, 6*, 352-355.

Mauritz, R. (1873). A tizedes törtekről. [About decimal fractions]. *Az Országos Középtanodai Tanáregylet Közlönye, 7,* 299-306.

Mauritz, R. (1883). A reáliskolai tanterv kérdése. [The question of the real school curriculum.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 17*, 174-180.

Mayer, J. (1868). Könyvismertetés: Ábel, K.: Mértan a középtanodák számára. Pest, 1867. [Book review: Ábel, K.: Geometry for High schools, Pest, 1867.]. *Országos Középikolai Tanáregylet Közlönye, 1*, 97-102.

Mayer, J. (1873). A síkháromszögtani tanítás módszeréhez. [For the method of teaching planar triangles]. *Az Országos Középtanodai Tanáregylet Közlönye, 7*, 171-179.

Medveczky, I. (1894). A mathematika és physika tanítása a középiskolában és az egyetemen. [Teaching math and physics in high school and university.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 28*, 480-481.

Mendlik, F. (1871). Könyvismertetés: Mauritz, R.: Általános számtan és algebra. Pest, 1870. [Book review: Mauritz, R.: General arithmetic and algebra. Pest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 4*, 696-698.

Mendlik, F. (1892a). A tizes számrendszer. [The decimal number system.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 26*, 462-463.

Mendlik, F. (1892b). Határidő-számolás egyszerű kamatszámolással. [Deadline calculation with simple interest calculation.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 26,* 657-661.

Mendlik, F. (1896). A mathematikai kifejezések fogalmazása. [Formulation of mathematical terms.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 30*, 123-128, 169, 351-354.

Mészáros, I. (1992). Magyar Paedagogia-Magyar Pedagógia. 1892–1992. [Hungarian Pedagogy-Hungarian Pedagogy. 1892–1992.]. *Magyar Pedagógia*, *92*(1), 5-24.

Mészáros, I. (1996). *A magyar nevelés- és iskolatörténet kronológiája, 996–1996*. [Chronology of Hungarian education and school history, 996–1996.]. Nemzeti Tankönyvkiadó, Budapest.

Mikola, S. (1902). A számtantanítás gyakorlati berendezéséről. [On the practical equipment of number teaching.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *36*, 493-497, 514-518.

Mikola, S. (1903). Reformmozgalmak a matematika tanítása terén Angliában. [Reform movements in the teaching of mathematics in England.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 37*, 197-202.

Mikola, S. (1908). Könyvismertetés: Beke, M.: Bevezetés a differenciál- és integrálszámításba. Budapest. 1908. [Book review: Beke, M.: Introduction to differential and integral calculus. Budapest. 1908.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *41*, 584-585.

Mikola, S. (1909). A matematika tanítás reformja. [Reforming the teaching of mathematics.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 43*, 10-15.

Mikola, S. (1912). Jelentés a matematikai reformbizottság kérdéseire beérkezett feleletekről. [Report on the answers to the questions of the Mathematical Reform Commission.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 46*, 341-350.

Mikola, S. (1913). A matematikai tanítás kongresszusa Párizsban 1914 április 6-8-ig. [Congress of Mathematical Teaching in Paris from 6 to 8 April 1914.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 47*, 171-175.

Mikó, I. (1943). *A Magyar államnyelv kérdése a Magyar Országgyűlés elött: 1790-1825*. [The issue of the Hungarian official language before the Hungarian Parliament: 1790-1825]. Kolozsvár, Erdélyi Múzeum-Egyesület.

Morel, T. (2014). Arithmetical periodicals in late eighteenth-century Germany: ‘Mathematics for the use and the pleasure of civic life.’ Archives *Internationales d'Histoire des Sciences, 64*(172-173), 411-441.

Nagy, G. (2016). Tudománymetria és neveléstudomány. [Science metrics and educational science.]. *Iskolakultúra, 26*(2), 50-62.

Nagy, P. T. (1994). *Tanügyigazgatás és oktatáspolitika a polgári Magyarországon*. [Education administration and education policy in civil Hungary.]. Kandidátusi disszertáció, Budapest.

Nagy, P. T. (2005). Az állami befolyás növekedése a magyarországi oktatásban 1867-1945. [The increase of state influence in education in Hungary 1867-1945.]. *Iskolakultúra, 6-7,* 3-229.

Nagy, P. T. (2006). *The social and political history of Hungarian education.* John Wesley College, Budapest.

Németh, K. (1880). A rajzoló geometria tanításának új terve. [A new curriculum for teaching drawing geometry.]. *Az Országos Középtanodai Tanáregylet Közlönye*, *14*, 113-120.

Neukomm, G. (1956) Az 1956. Arany Dániel versenyekről. [About the 1956 Daniel Arany competitions.]. *A Matematika Tanítása, 4,* 49-52.

Obláth, R. (1954). Tudós kutató középiskolai tanárok. [Scientist researching high school teachers.]. *A Matematika Tanítása, 2,* 147-149, 177-181.

Obláth, R. (1955). Beke Manó, a nagy magyar tanár (1862-1945). [Manó Beke, the great Hungarian teacher (1862-1945).]. *A Matematika Tanítása*, *3*, 147-151.

Pálffy, G. (2021). *Hungary between two empires 1526-1711*. Indiana University Press.

Péter, L. (1992). The aristocracy, the gentry and their parliamentary tradition in nineteenth century Hungary. *The Slavonic and East European Review, 70*(1), 77-110.

Pogány, J. (1953). Hozzászólás a matematika tankönyvek kérdéséhez. [Post a comment to the question on the mathematics textbooks.]. *A Matematika Tanítása, 1,* 138-143.

Ponomarjov, A. (1953). A politechnikai oktatás és a matematikatanítás. [Polytechnic education and mathematics teaching.]. *A Matematika Tanítása, 1*, 65-70.

Ponori Thewrewk, E. (1868). Római és görög pénzszámítás. [Roman and Greek money calculation.]. *Az Országos Középtanodai Tanáregylet Közlönye, 1*, 63-74.

Porszász, J. (1874). A mértan és a mértani rajzolás tanítása középtanodáinkban. [Teaching geometry and geometric drawing idin our secondary schools]. *Az Országos Középtanodai Tanáregylet Közlönye, 8,* 28-40.

Pósa, V. (1953). Az egyenlettanítás problémája az ú.n. "típusfeladatok" bevezetése után. [The problem of teaching equations after the introduction of so-called "type problems."]. *A Matematika Tanítása, 1*, 134-138.

Preveraud, T. (2013). American mathematical journals and the transmission of French textbooks into USA. In B. Bjarnadóttir, F. Furinghetti, J. Prytz, & G. Schubring (Eds.), *"Dig where you stand" 3. Proceedings of the Third International Conference on the History of Mathematics Education*. Uppsala.

Prudnikov, E. (1956). *Russkie pedagogi matematiki XVIII–XIX vekov* [Russian mathematics educators of the XVIII-XIX centuries]. Moscow: Gosudarstvennoe uchebno-pedagogicheskoe izdatel'stvo.

Pukánszky, B., & Németh, A. (1999). *Neveléstörténet*. [*History of education.*]. Nemzeti Tankönyvkiadó.

Radnai, G. (2014). *Fizikusok és matematikusok az Eötvös Collegiumban 1895–1950*. [Physicists and mathematicians at the Eötvös Collegium 1895-1950.]. ELTE Eötvös József Collegium.

Rados, I. (1910). Könyvismertetés: Beke, M.: Differenciál- és integrálszámítás. Budapest, 1910. [Book review: Beke, M.: Differential and integral calculus. Budapest, 1910.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 44*, 378- 381.

Rados, I. (1937). Könyvismertetés: Kerekjártó, B.: A geometria alapjairól. Az euklidesi geometria elemi felépítése. Szeged. 1937. [Book review: Kerekjártó, B.: On the basics of geometry. Elementary structure of Euclidean geometry. Szeged. 1937.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 71*, 219-220.

Rainer, M. J. (1996). Nagy Imre 1953-1958. *Politikai életrajz. [Imre Nagy, 1953–1958. Political biography, vol. 2]*. Budapest: 1956 Institute, 486.

Rajner, F. (1903). Mauritz Rezső. [Rezső Mauritz.]. *MagyarPedagogia, 12*(2), 73-79.

Rátz, L. (1912). Az infinitezimálsi számítások bevezetésének kérdése. [The issue of introducing infinitesimal calculations.]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *46*, 250-251.

Reif, J. (1875). Könyvismertetés: Császár, K.: Számtan a középiskolák alsó osztályai számára. [Book review: Császár, K.: Arithmetic for the lower grades of secondary schools.]. *Az Országos Középtanodai Tanáregylet Közlönye, 9*, 284-287.

Riedl, F. (1884). A reáliskolai utasítások tervezetéről. [About the draft real school instructions.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 18*, 325-328.

Reiman, I. (1954). A csoportelmélet geometriai alkalmazásáról. [On the geometric application of group theory.]. *A Matematika Tanítása, 2*, 43-51.

Reiman, I. (1955). A matematikai felvételi vizsgák néhány tapasztalata a Budapest-i Eötvös Loránd Tudományegyetemen. [Some experiences of mathematics entrance exams at Eötvös Loránd University in Budapest.]. *A Matematika Tanítása, 3*, 101-105.

Roman, E. (2003). *Austria-Hungary and the successor states: A reference guide from the Renaissance to the present*. Infobase Publishing.

Salamon, K. (1998). *A csonka ország* (Vol. 30). [*The truncated country*.]. Magyar Könyvklub.

Sárközy, P. (1925). Pillanatfölvételek a mennyiségtan jelenlegi állásáról. [Snapshots of the current state of quantity sciences.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 59*, 318-323.

Schmidt, Á. (1883). Könyvismertetés: Močnik-Klamarik-Wagner: Geometria a középiskolák felősbb osztályai számára. 3rd kiadás. Budapest, 1883. [Book review: Močnik-Klamarik-Wagner: Geometry for the upper grades of secondary schools. 3rd edition. Budapest, 1883.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 17,* 360-362.

Schmidt, Á. (1895). Könyvismertetés: Molnár I: Magyar Államszámviteltan. Budapest, 1895. [Book review: Molnár I: Hungarian Public Accounting. Budapest, 1895.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 30*, 426-427.

Schmidt, J. (1890). A számtan rendszeres tanításához középiskoláinkban. [To teach arithmetic regularly in our high schools.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 24,* 312-315.

Schmidt, S. (1991). *Rechenunterricht und Rechendidaktik an den Rheinischen Lehrerseminaren im 19. Jahrhundert: eine Studie zur Fachdidaktik innerhalb der Volksschullehrerbildung an Lehrerseminaren, 1819-1872*. [Arithmetic lessons and arithmetic didactics at the Rhenish teacher training colleges in the 19th century: a study on subject didactics within elementary school teacher training at teacher training colleges, 1819-1872.].Köln: Böhlau.

Schröder, K. (1869). Könyvismertetés: Szabó, I.: Nézeleti mértan elemei, Pest, 1869. [Book review Szabó, I.: Elements of observational geometry, Pest, 1869.]. *Az Országos Középtanodai Tanáregylet Közlönye, 2*, 359-361.

Schröder, K. (1870). Válasz Brassai Sámul bírálatára. [Reply to criticism of Samuel Brassai]. *Az Országos Középtanodai Tanáregylet Közlönye, 3*, 581-586.

Schröder, K. (1877). Könyvismertetés: Suppan V.: Ábrázoló geometria a középiskolák felsőbb osztályai számára. Budapest, 1877. [Book review Suppan V.: Descriptive geometry for the upper grades of high schools. Budapest, 1877.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 271-281.

Schubring, G. (2003). *L'Enseignement Mathématique* and the first International Commission (IMUK): the emergence of international communication and cooperation. In D. Coray & F. Furinghetti (Eds.), *One hundred years of* L'Enseignement mathématique*: Moments of mathematics education in the twentieth century* (pp. 49-65). Geneva: L'Enseignement Mathématique.

Schubring, G. (2014). Mathematics education in Germany (modern times). In *Handbook on the history of /mathematics education* (pp. 241-255). Springer.

Smid, H. (1997). *Een onbekookte nieuwigheid? Invoering, omvang, inhoud en betekenis van het wiskundeonderwijs op de Franse en Latijnse scholen 1815-1863*. [An uncooked novelty? Introduction, Extent, Content and Significance of Mathematics Teaching in French and Latin Schools 1815-1863.]. Delft University Press.

Stanic, G., & Kilpatrick, J. (Eds.). (2003). *A history of school mathematics*. National Council of Teachers of Mathematics.

Stamper, A. W. (1906). *A history of the teaching of elementary geometry with references to present-day problems*. Doctoral dissertation, Teachers College, Columbia University.

Suppán, V. (1877). Tanítható-e a hatványozás és gyök vonás a középiskola aló osztályaiban? [Can exponentiation and radicalization be taught in the lower grades of high school?]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 492-494.

Suppán, V. (1878). A műszók, különösen az ábrázoló geometriai műszók kérdéséhez. [For the question of terminology, especially descriptive geometric terminology]. *Az Országos Középtanodai Tanáregylet Közlönye, 12*, 422-427.

Suppán, V. (1879a). Új módszer sugár felületek síkmetszetének meghatározására. [A new method for determining the plane section of radial surfaces.]. *Az Országos Középtanodai Tanáregylet Közlönye, 13*, 515-517.

Suppán, V. (1879b). A körárnyék tengelyeinek meghatározása. [Defining the axes of the circular shadow.]. *Az Országos Középtanodai Tanáregylet Közlönye, 13*, 518-519.

Suppán, V. (1880). A rajzoló geometria kérdéséhez. [To the question of drawing geometry.]. *Az Országos Középtanodai Tanáregylet Közlönye, 14*, 241-248.

Suppán, V. (1882). Adalékok a számvetés oktatásához a középiskolában. [Additives for teaching accounting in high school.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 16*, 355-362, 436-439.

Suppán, V. (1883). Számtanomról. [About my arithmetic.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 17*, 243-246.

Surányi, J., & Varga, T. (1954). Az algebra alaptétele. [The basic theorem of algebra.]. *A Matematika Tanítása, 2*, 109-116.

Surányi, L. (2017). “Sohasem azt tanítjuk, amit tanítunk”-A középiskolai matematikatanítás reformjának történetéből. [“We never teach what we teach”-From the history of reforming mathematics teaching in high school.]. *Természettudományi Közlöny-Természet Világa, 148*(1), 27-35.

Szalontai, T. (1995). Changing educational framework in the teaching of mathematics in Hungary. *Teaching Mathematics and Its Applications, 14*(4), 149-155.

Szarka, L. (2017). Jogfeladás vagy éltető kompromisszum. [Surrender or life-giving compromise.] *Tempevölgy, 9*(4), 79-89.

Szász, F. (1955). Könyvismertetés: B. A. Kutuzov: Geometria. Budapest, 1954. [Book Review: B. A. Kutuzov: Geometry.Budapest, 1954.]. *A Matematika Tanítása, 3*, 144-146.

Szecsődy, J. (1877). Észrevételek a számtani szőrszálhasogatásokra. [Comments on arithmetic hair splits.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11,* 300-303.

Szekeres, K. (1884). A mathematika tanításáról a gymnasiumban. [About teaching mathematics in the gymnasium.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 18*, 93-97.

Szinnyei, J. (1914). *Magyar írók élete és munkái*. [The life and works of Hungarian writers.]. Hungarológiai Alpakönyvtár. https://mek.oszk.hu/03600/03630/html/index.htm

Szirtes, I. (1881). Másodrendü felületsik metszésére és ennek pólusára vonatkozó feladvány megfejtése. [Solve the problem of intersecting a second-order surface plane and its pole.]. *Az Országos Középtanodai Tanáregylet Közlönye, 15*, 247-251.

Szirtes, I. (1884). Az ábrázoló geometria az új tantervben. [Descriptive geometry in the new curriculum]. *Az Országos Középiskolai Tanáregyesület Közlönye*, *18,* 146-149.

Szirtes, I. (1897). A rajzoló és ábrázoló geometria tanítása Szász-, Porosz-, és Bajorországban. [Teaching drawing and representational geometry in Saxony, Prussia, and Bavaria]. *Az Országos Középiskolai Tanáregyesület Közlönye, 31,* 594-599, 606-611.

Szirtes, I. (1898). A mathematikai tantárgyak tanterve a közoktatási tanács javaslatában. [Curriculum for mathematics subjects as proposed by the Public Education Council.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 32*, 93-96.

Szirtes, I. (1901). Könyvismertetés: Sárkány, L.: Mértan. Kézikönyv és példatár a gymnasiumok felsőbb osztályai számára. Budapest, 1901. [Book review: Sárkány, L.: Geometry. Handbook and example for the upper classes of gymnasiums. Budapest, 1901.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 35,* 334-335.

Szirtes, I. (1910). Könyvismertetés: Lenkei, L.: Segédeszköz az ábrázoló mértan modern tanításához reáliskolás, polgári fiu-, hadapród, és ipariskolák számára. Budapest, 1910. [Book review: Lenkei, L.: A tool for the modern teaching of descriptive geometry for real schools, civil boys, military prods, and industrial schools. Budapest, 1910.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 44*, 166-167.

Szontágh, G. (1893). A mathematika és physikai tanítás kapcsolata. [The relationship between mathematics and physics education.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 27,* 205-209.

Szőke, B. (1905). A trigonometria tanításáról. [On the teaching of trigonometry.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 39,* 716-719.

Szutrély, I. (1883). Néhány szó a háromszögtan alapvetéséhez. [A few words on the basics of trigonometry.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 17*, 292-293.

Tasnádi, I. (1955). A mátrix-számítás elemei. [Elements of matrix calculation.]. *A Matematika Tanítása, 3*, 11-17, 45-53.

Tóth, G. (1934). Vitaest a ininitézimális számítás módszeres tanításáról. [Discussion on the systematic teaching of infinitesimal computation.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 68*, 80-85.

Tóth, G. (1942). Könyvismertetés: Dr. Veress P: Elemi mennyiségtan magasabb szempontból. Budapest, 1942. [Book review: Dr. Veress P: Elementary arithmetic from a higher perspective. Budapest, 1942.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 76*, 144.

Tóth, G. (1943). Mennyiségtani oktatásunk helyzetképe. [The situation of our quantitative education.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 77*, 1-8.

Tucker, S. C. (Ed.). (2013). *The European powers in the First World War: An encyclopedia*. Routledge.

Vadas, G. (1953). Politikai és erkölcsi nevelés a matematika tanításában. [Political and moral education in the teaching of mathematics.]. *A Matematika Tanítása, 1*, 97-102.

Varga, T. (1953). Az I. Gimnáziumi kísérleti matematika tankönyvről. [About the experimental mathematics textbook for the 1st gymnazium.]. *A Matematika Tanítása, 1*, 169-174.

Varga, T. (1954). A másodfokú egyenletek tanításáról. [On teaching quadratic equations.]. *A Matematika Tanítása, 2*, 170-176.

Varga, T. (1955). A másodfokú egyenletek tanításáról. [On teaching quadratic equations.]. *A Matematika Tanítása, 3*, 5-10, 33-37.

Varga, T. (1956) Az új I. gimnáziumi matematika -tankönyv algebrai részéről. [On the algebraic part of the new mathematics textbook for 1st grade gymnasium.]. *A Matematika Tanítása, 4*, 16-21.

Veress, P. (1943). Könyvismertetés: Szőkéfalvi Nagy Gy.: A geometriai szerkesztések elmélete. Kolozsvár. [Book review: Szőkéfalvi Nagy Gy.: Theory of geometric constructions. Cluj-Napoca.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 77*, 255-256.

Visnya A. (1912). Tájékoztató a "Matematikai Oktatás Nemzetközi Bizottsága" hazai és külföldi albizottságainak működéséről. [Information on the operation of the domestic and foreign subcommittees of the "International Commission for Mathematical Education".]. *Az Országos Középiskolai Tanáregyesület Közlönye, 46*, 447-455.

Vogeli, B. (1997). *Special secondary schools for the mathematically and scientifically talented: An international panorama*. Teachers College, Columbia University.

Wagner, F. (1885). Könyvismertetés: Mauritz R: Számtan a közép és polgári iskolák számára. 5. javított kiadás. Budapest, 1885. [Book review: Mauritz R: Arithmetic for gymnasiums and civic schools. 5th revised edition. Budapest, 1885.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 19*, 129-131.

Walla, F. (1879). Tételek és megfordításuk, inductió a mathematikában. [Theorems and their inversion, induction in mathematics.]. *Az Országos Középtanodai Tanáregylet Közlönye, 13*, 536-543.

Watson, F. (1909). *The beginnings of the teaching of modern subjects in England*. London: Pitman.

Weisz, B. (1875). A statisztika a tantervben. [Statistics in the curriculum]. *Az Országos Középtanodai Tanáregylet Közlönye, 9*, 430-435.

Wiederman, K. (1871). Könyvismertetés: Salamin L.-Linkess M.: A mennyiségi és természettani földrajz vezérfonala. Pest, 1870. [Book review: Salamin L.-Linkess M.: The guideline of quantitative and natural geography. Pest, 1870.]. *Az Országos Középtanodai Tanáregylet Közlönye, 4*, 319-323.

Wieschenberg, A. A. (1984). *Identification and development of the mathematically talented: The Hungarian experience*. Doctoral dissertation. Teachers College, Columbia University.

Wohlráb, F. (1875). Egy számvetési játék. [A counting game.]. *Az Országos Középtanodai Tanáregylet Közlönye, 9*, 162-164.

Wohlráb, F. (1877). Számtani szőrszálhasogatások. [Arithmetic hair splitting]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 142-147, 164-168.

Wohlráb, F. (1878). Könyvismertetés: Martus, H.: Mathematikai feladatok a középiskolák felső osztályai számára (fodította Császár K.). Budapest, 1878. [Book review: Martus, H.: Mathematical problems for the upper secondary schools (translated by K. Császár, Budapest, 1878.]. *Az Országos Középtanodai Tanáregylet Közlönye, 11*, 216-219.

Wohlráb, F. (1879). Az arányosság tényezője. [Factor of proportionality.]. *Az Országos Középtanodai Tanáregylet Közlönye, 13*, 261-266, 299-302.

Wohlráb, F. (1881). A rajzoló geometria bírálata. [Criticism of drawing geometry.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 15*, 12-26, 57-58, 73, 82, 155-163, 191-194, 318-322, 344-350, 377-381, 415-420.

Wohlráb, F. (1882a). A kör kerületének meghatározása. [Determining the perimeter of the circle.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 16*, 140-141.

Wohlráb, F. (1882b). Könyvismertetés: Suppán V: Számtan. Budapest, 1882. [Book review: Suppán V: Arithmetic. Budapest, 1882.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 16*, 533-545, 574-585, 609-620.

Wohlráb, F. (1886). A néma számok érdekében. [For the sake of silent numbers.]. *Az Országos Középiskolai Tanáregyesület Közlönye, 20*, 646-651.

Wolff, G. (1915). *Der mathematische Unterricht der höheren Knabenschulen Englands*. [The Mathematical Instruction in the Boys' Higher Schools of England.]. Leipzig: Teubner.

Wolters Kluwer. (n.d.). *1844. évi II. Törvénycikk - Ezer év Törvényei*. [1844 Law Article-Laws of a thousand years.]. https://net.jogtar.hu/ezer-ev-torveny?docid=84400002.TV&searchUrl=%2 Fezer-ev-torvenyei%3Fpagenum%3D27&fbclid=IwAR1H4tnwkollRz EXiELXKG9ZAFI_HUt8wFUdCix0-uCscutCkOiCzzgz5gM

Appendix A: Detailed Coding System for Main Categories

Main Category	Articles
Curriculum	**General:** articles reviewing the school program in general or describing specific problem areas of the curriculum. **Examples:** • Discussing curricular changes such as content selection and distribution • Introducing new subject(s) (statistics, calculus, etc) • Recommending content for teachers' trainings • Describing foreign trends/reform movements • Illustrating ideological issues in mathematics education • Introducing the content of mathematics entrance exams to colleges
Teaching Methods	**General:** articles related to the process of teaching and learning mathematics. **Examples:** • Recommending common mathematical terminology • Describing lessons/instructional practices/extracurricular activities • Presenting methods for reviews/homework/assessments • Introducing general techniques of classroom managements • Explaining pedagogical techniques/methods for professional developments/training courses
School Mathematics	**General:** articles describing mathematics concepts, proofs of theorems, or articles illustrating the history of mathematics **Examples:** • Describing concepts in secondary level algebra and geometry • Presenting concepts in higher mathematics (group theory/matrix analysis) • Introducing the live of mathematicians/mathematics educators
Book/Textbook Review	**General:** articles including reviews of books and textbooks. **Examples:** • Hungarian book reviews • Hungarian journal reviews • Foreign book reviews • Foreign journal reviews

Appendix B: List of Articles in *Journal of the National Association of Secondary School Teachers* Between 1868 and 1944

Volume	Year	Author	Title	Pages	Category	Subcategory
1.	1868	Ponori Thewrewk, Emil	Római és Görög pénszámítás. [Calculation with Roman and Greek money.].	63- 74	Teaching method	Arithmetic
1.	1868	Mayer, József	Ábel Károly: Mértan Középtanodák számára. [Károly Ábel: Geometry for Secondary Schools].	9	Book/Journal Reviews	Geometry
2.	1868	Schröder, Károly	Szabó Ignác: Nézleti mértan elemei. [Ignác Szabó: Elements of observational geometry].	359-361	Book/Journal Reviews	Geometry
3.	1869	Dr. Császár, Károly	A mennyiségtani oktatás hiányainak okai. [Causes of shortcomings in mathematics education].	236-244	Curriculum	Algebra
3.	1869	Mauritz, Rezső	Bajúsz Mihály: Elemző tértan a lapban. [Mihály Bajúsz: Analysis in plane geometry].	142-144	Book/Journal Reviews	Geometry
3.	1869	Ábel, Károly	Észrevételek Bajúsz Mihály Laptértanához. [Comments on Mihály Bajúsz: Analysis in plane geometry].	278-282	Book/Journal Reviews	Geometry
3.	1869	Ábel, Károly	Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht. [Journal for mathematics and science education].	282- 285	Book/Journal Reviews	General
3.	1869	Bajusz, Mihály	Három tértani axiomáról. [About three spatial axioms].	371-376	Book/Journal Reviews	Geometry
3.	1869	Ábel, Károly	Válasz Bajusz Mihály fenebbi soraira. [An answer to the above lines of Mihály Bajusz].	376-383	Book/Journal Reviews	Geometry
3.	1869	Dr. Heinrich, Gusztáv	Berec Antal: A mennyiségtani földrajz alapvonalai. [Antal Berec: Basics of Quantitative Geography].	320-325	Book/Journal Reviews	Arithmetic
3.	1869	Lutter, János	Lutter János válasza: Berec - A mennyiségtani földrajz alapvonalai. [János Lutter's answer: Berec - The basics of quantitative geography].	514-515	Book/Journal Reviews	Arithmetic
3.	1869	Dr. Heinrich, Gusztáv	Heinrich Gusztáv válasza: Berec - A mennyiségtani földrajz alapvonalai. [Answer by Gusztáv Heinrich: Berec - Basics of Quantitative Geography].	515-516	Book/Journal Reviews	Arithmetic
3.	1869	Brassai, Sámuel	Schröder Károly: Vezérfonál a mértani szabadkézi rajz tanításánál. [Károly Schröder: Leading way in teaching geometric freehand drawing].	388–397	Book/Journal Reviews	Geometry
3.	1869	Schröder, Károly	Válasz Brassai Sámuel bírálatára. [Response to Samuel Brassai's criticism].	581-586	Book/Journal Reviews	Geometry
3.	1869	Brassai, Sámuel	Bíráló megjegyzései az előbbi válaszhoz. [Reviewer's comments on the former answer].	586-587	Book/Journal Reviews	Geometry
3.	1869	Dr. Császár, Károly	Vész János Armin: A legkisebb négyzetek elmélete. [János Armin Vész: Theory of Least Squares.].	491-495	Book/Journal Reviews	Algebra
4.	1870	Domokos, Jenő	Miként kell egy oly teljes köbből a köbgyököt kivonni, melynek gyöke három jegyű szám? [How to draw a	86-88	Teaching method	Algebra

Volume	Year	Author	Title	Pages	Category	Subcategory
			cubic root from a whole number whose root is a three-digit number?].			
4.	1870	Wiedermann, Károly	Salamin L. - Linkess M.: A mennyiség- és természettani földrajz vezérfonala. [Salamin L. - Linkess M.: The guideline of quantitative and natural geography.].	319-323	Book/Journal Reviews	Arithmetic
4.	1870	Mayer, József	Bajúsz Mihály: Laptértan és Tömörtan. [Mihály Bajúsz: Plain and Solid Geometry.].	611-620	Book/Journal Reviews	Geometry
4.	1870	Vész, Albert	Bajúsz Mihály: Laptértan és Tömörtan. [Mihály Bajúsz: Plain and Solid Geometry.].	620-626	Book/Journal Reviews	Geometry
4.	1870	Mauritz, Rezső	Bajúsz Mihály · Lapi háromszögmértértan. [Mihály Bajúsz · Plane triangular geometry.]. Bajúsz Mihály · Gömbi háromszögmértan. [Mihály Bajúsz · Spherical triangle geometry.].	626-629	Book/Journal Reviews	Geometry
4.	1870	Ábel, Károly	Bajúsz Mihály · Lapi háromszögmértértan. [Mihály Bajúsz · Plane triangular geometry.].Bajúsz Mihály · Gömbi háromszögmértan. [Mihály Bajúsz · Spherical triangle geometry.].	629-634	Book/Journal Reviews	Geometry
4.	1870	Schindler, Emil	Bajúsz Mihály: Elemző tértan a lapban. [Mihály Bajúsz: Analysis in plane geometry].	635 -639	Book/Journal Reviews	Geometry
4.	1870	Heller, Ágost	Bajúsz Mihály: Elemző tértan a lapban. [Mihály Bajúsz: Analysis in plane geometry].	639-641	Book/Journal Reviews	Geometry
4.	1870	Ábel, Károly	Mauritz Rezső: Általános számtan és algebra. [Mauritz Rezső: General arithmetic and algebra.].	641-646	Book/Journal Reviews	Algebra
4.	1870	Mendlik, Ferenc	Mauritz Rezső: Általános számtan és algebra. [Mauritz Rezső: General arithmetic and algebra.].	647-648	Book/Journal Reviews	Algebra
4.	1870	Mayer, József	Ábel Károly: Mértan. [Károly Ábel: Geometry.].	648	Book/Journal Reviews	Geometry
4.	1870	Ábel, Károly	Zeitschrift für mathematischen und naturwissenschaftlichen Untericht. [Journal for math and science education].	669-675	Book/Journal Reviews	General
5.	1871	Ábel, Károly	A mennyiségtani műszók érdekében. [For quantitative terms.].	493-498	Teaching method	Arithmetic
5.	1871	Mauritz, Rezső	Dr. Lutter Nándor: A mennyiségtan elemei. [Dr. Nándor Lutter: Elements of arithmetic.].	157-160	Book/Journal Reviews	Arithmetic
5.	1871	Fridrik, Dezső	Dr. Lutter Nándor: A mennyiségtan elemei. [Dr. Nándor Lutter: Elements of arithmetic.].	160-164	Book/Journal Reviews	Arithmetic
5.	1871	Ábel, Károly	Dr. E. Bardey: Methodisch geordnete Aufgabensammlung. [Dr. E. Bardey: Methodological Arrangement of Exercises].	411-413	Book/Journal Reviews	Algebra
6.	1872	Mauritz, Rezső	Frischauf J. dr.: Lehrbuch der allgemeiner Arithmetik, Einleitung in die analytische Geometrie, Elemente der Geometrie, Die geometrischen Constructionene. [Frischauf J. dr.:	352-355	Book/Journal Reviews	Geometry

Volume	Year	Author	Title	Pages	Category	Subcategory
			Textbook of General Arithmeticé Introduction to Analytical Geometry, Elements of Geometry, The Geometrical Constructions].			
6.	1872	Mauritz, Rezső	Hofmann: Proben aus einer Vorschule der Geometrie. [Hofmann: Samples from a basic geometry.].	303, 337	Book/Journal Reviews	Geometry
7.	1873	Dr. Császár, Károly	A számtan oktatásához. [To arithmetic teaching.].	71-82	Teaching method	Arithmetic
7.	1873	Mayer, József	A síkháromszög mértani tanítás módszeréhez. [For the method of teaching planar triangles.].	171-179	Teaching method	Algebra
7.	1873	Dr. Császár, Károly	Thales és a pyramisok megmérése. [Thales and measuring the pyramids.].	198-201	Teaching method	Geometry
7.	1873	Mauritz, Rezső	A tizedes törtekről. [About decimal fractions.].	299-306	Teaching method	Arithmetic
7.	1873	Dr. Császár, Károly	Dr. Weisz József: A sokszögtan továbbfejtése. [Dr. József Weisz: Further discussions of polygons.].	390-393	Book/Journal Reviews	Geometry
7.	1873	Heller, Ágost	Dr. Suter H. (ford) Lederer Sándor: A mathematikai tudományok története. [Dr. Suter H. (ford) Sándor Lederer: The History of the Mathematical Sciences.].	579-583	Book/Journal Reviews	General
7.	1873	Fuchs, Pál	Fuchs Pál: Kérdemények a mennyisegtani természettanból. [Paul Fuchs: Mathematics questions from natural science.].	589-594	Book/Journal Reviews	Algebra
8.	1874	Porszász, József	A mértan és a mértani rajz tanítása középtanodáinkban. [Teaching geometry and geometric drawing in our high schools.].	28-40	Teaching method	Geometry
8.	1874	Ábel, Károly	A mathematika oktatás tekintettel az új tantervre. [Mathematics education with respect to the new curriculum.].	247-254	Curriculum	General
8.	1874	Kreybig, Lajos	Észrevételek Porszász József Úr "A mértan és mértani rajzolás tanítás középiskoláinkban" című értekezésére. [Comments on the dissertation of József Porszász entitled "Teaching geometry and geometric drawing in our secondary schools".].	255-259	Curriculum	Geometry
8.	1874	Dr. Lutter, Nándor	Ellenbírálat "A mathematikai oktatás, tekintettel az új tantervre" című bírálatra. [Counter-critique of "Mathematics Education with a New Curriculum."].	403-413	Curriculum	General
8.	1874	Ábel, Károly	Észrevételek az ellenbírálatra. {Comments on the counter -critique.].	413-419	Curriculum	General
8.	1874	Dr. Lutter, Nándor	A mennyiségtan a poroszországi gymnasiumokban. [Arithmetic in Prussian Gymnasiums.].	482-485	Curriculum	General
8.	1874	N. (only one letter is given)	Teveli Varga József: Sík háromszögtan. [József Teveli Varga: Plane triangulation.].	392-394	Book/Journal Reviews	Algebra
8.	1874	Teveli Varga, József	Válasz N -nek. [Answer to N.].	441-442	Book/Journal Reviews	Algebra
8.	1874	Ábel, Károly	Hesse, Dr. Otto: Die Determinanten. [Hesse, Dr. Otto: The determinants.].	231	Book/Journal Reviews	Algebra

Volume	Year	Author	Title	Pages	Category	Subcategory
8.	1874	Ábel, Károly	Studnicka, Dr. F. J.: Einleitung in d. Theorie d. Determinanten. [Studnicka, Dr. F. J.: Introduction to the theory of determinants.].	231- 234	Book/Journal Reviews	Algebra
8.	1874	Ábel, Károly	Hattendorf K.: Einleitung in die Lehre, v. D. Determinanten [Hattendorf K.: Introduction to the teaching of determinants.].	231-234	Book/Journal Reviews	Algebra
8.	1874	Ábel, Károly	Dölp Dr. H: Die Determinanten. [Dölp Dr. H: The Determinant.].	231 -234	Book/Journal Reviews	Algebra
8.	1874	Ábel, Károly	Reidt Dr. Fr.: Vorschule der Theorie der Deteminanten. [Reidt Dr. Fr.: Introduction to the theory of determinants.].	231 -234	Book/Journal Reviews	Algebra
9.	1875	Dr. Császár, Károly	A Gauss-féle logarithmusok a középiskolai oktatásban. [Gaussian logarithms in secondary education.].	212-218	Teaching method	Algebra
9.	1875	Ábel, Károly	Észrevételek a symmetriális determinansok egyik tételeinek dr. Günther közölte elemi levezetésére. [Comments on the proof of one of the theorems of symmetric determinants was given by Dr. Günther.].	234-239	Teaching method	Algebra
9.	1875	Lewin, Jakab	Az idomszámok egyszerű tárgyalásáról. [About the simple presentation of profile numbers.].	393-403	Teaching method	Algebra
9.	1875	Dr. Weisz, Béla	A statisztika a tantervben. [Statistics in the curriculum.].	430-435	Curriculum	General
9.	1875	Ábel, Károly	Dr. Császár Károly: Algebra. [Dr. Károly Császár: Algebra.].	182-189	Book/Journal Reviews	Algebra
9.	1875	Reif, Jakab	Dr. Császár Károly · Számtan II., III. [Dr. Károly Császár · Arithmetic II., III.].	284-287	Book/Journal Reviews	Arithmetic
9.	1875	Éberling, József	Dr. Lutter Nándor: Közönséges számtan. [Dr. Nándor Lutter: Ordinary Arithmetic.].	376-380	Book/Journal Reviews	Arithmetic
9.	1875	Dr. Császár, Károly	A Gauss-féle logarithmusok a középiskolai oktatásban. [Gaussian logarithms in secondary education.].	212-218	Teaching method	Algebra
9.	1875	Dr. Wohlrâb, Flóris	Egy számvetési játék. [A counting game.].	162-164	Teaching method	Algebra
10.	1876	Dr. Császár, Károly	A geometriai diszítményekről. [About geometric decorations.].	134-137	Curriculum	Geometry
10.	1876	Landau, Alajos	A mértan és szabadkézi rajz a középiskola első osztályában. [Geometry and freehand drawing in the first grade of high school.].	293-300	Teaching method	Geometry
10.	1876	Dr. Császár, Károly	Dr. Kőnig Gyula: Bevezetés a felsőbb algebrába. [Dr. Gyula Kőnig: Introduction to higher algebra.].	272-275	Book/Journal Reviews	Algebra
10.	1876	Éberling, József	Dr. Császár Károly: Geometria a középiskolák felső osztályai számára. [Dr. Károly Császár: Geometry for upper secondary schools.].	328-338	Book/Journal Reviews	Geometry
11.	1877	Dr. Császár, Károly	A mathematikai műszók érdekében. [For mathematical terms.]	107-111	Teaching method	General
11.	1877	Dr. Wohlrâb, Flóris	Számtani szőrszálhasogatások. [Arithmetic hair splits.].	142-147, 164-168	Teaching method	Arithmetic

Volume	Year	Author	Title	Pages	Category	Subcategory
11.	1877	Szecsődy, József	Észrevételek a számtani szőrszálhasogatásokra. [Comments on arithmetic hair splits.].	300-303	Teaching method	Arithmetic
11.	1877	Horváth, Miklós	Hibás műszók és germanismusok az arithmetikában. [Incorrect words and Germanisms in arithmetic.].	304-306	Teaching method	Arithmetic
11.	1877	Heller, Ágost	A mennyiségtani levezetések szerepe a középiskolai természettani oktatásban. [The role of mathematics proofs in secondary science education.].	417-421	Teaching method	Arithmetic
11.	1877	Dr. Császár, Károly	A hatványozás és gyökvonás a középiskolák alsóbb osztályaiban. [The powers and roots in the lower grades of high schools.].	421-429	Curriculum	Arithmetic
11.	1877	Suppán, Vilmos	Tanítható-e a hatványozás és a gyök vonás a középiskola alsóbb osztályaiban, vagy nem? [Can powers and roots be taught in the lower grades of high school or not?].	492-494	Curriculum	Arithmetic
11.	1877	Dr. Wohlråb, Flóris	H. C. E. Martus: Mathematikai feladatok. Forditotta: Dr. Császár Károly. [H. C. E. Martus: Mathematical Problems. Translated by Dr. Károly Császár.].	216 -219	Book/Journal Reviews	Algebra
11.	1877	Schröder, Károly	Suppan Vilmos: Ábrázoló geometria. [Vilmos Suppan: Descriptive Geometry.].	271-281	Book/Journal Reviews	Geometry
11.	1877	Dr. Wohlråb, Flóris	Lentényi Márk: A mennyiségtani földrajz alapvonalai. [Márk Lentényi: The basics of quantitative geography.].	375-382	Book/Journal Reviews	Arithmetic
11.	1877	Dr. Wohlråb, Flóris	Elmaradhatatlan duplika a fölösleges replikára Lentényi Úrnak. [An indispensable duplicate of the unnecessary replica to Mr. Lentényi.].	510-511	Book/Journal Reviews	Arithmetic
11.	1877	Kis, Z.	Darvay Móricz: Bolygópályák meghatározása három geometrikus észlelet alapján. [Móricz Darvay: Determining planetary orbits based on three geometric observations.].	405-407	Book/Journal Reviews	Geometry
11.	1877	Dr. Darvay, Móricz	Kis Z. úrnak. [To Mr. Z. Kis.].	511-512	Book/Journal Reviews	Geometry
11.	1877	Dr. Császár, Károly	Kriesz Ferenc: Szerkesztő síkmértan a földmérés egyszerűbb tételeivel. [Ferenc Kriesz: Constuctive geometry with simpler theorems].	624-626	Book/Journal Reviews	Geometry
11.	1877	Dr. Császár, Károly	Eduard Bartl: Einleitung in die Theorie der Determinanten. [Eduard Bartl: Introduction to the theory of determinants.].	247-248	Book/Journal Reviews	Algebra
12.	1878	Dr. Császár, Károly	A tizedes törteknek feltalálója. [Inventor of decimal fractions.].	29-33	Curriculum	Arithmetic
12.	1878	Dr. Wohlråb, Flóris	A tizedes törtek feltalálójának története. [The story of the inventor of the decimal fractions.].	78-84	Curriculum	Arithmetic
12.	1878	Dr. Császár, Károly	Rajzoló geometriai oktatás. [Teaching drawing geometry.].	302- 304	Curriculum	Geometry

Volume	Year	Author	Title	Pages	Category	Subcategory
12.	1878	Dr. Császár, Károly	Az ábrázoló geometria fontosabb műszói. [The most important words in descriptive geometry.].	325- 328	Teaching method	Geometry
12.	1878	Suppán, Vilmos	A műszók, különösen az ábrázoló geometriai műszók kérdéséhez. [For the question of artificial terms, especially descriptive geometric artificial terms.].	422-427	Teaching method	Geometry
12.	1878	Brassai, Sámuel	Számtani műszavak. - Kritika és javaslat. [Arithmetic terms. - Criticism and suggestion.].	553-563	Teaching method	Arithmetic
12.	1878	Czógler, Alajos	Dühring a mathematikai tanulmányokról. [Dühring on mathematical studies.].	588-597	Teaching method	General
12.	1878	Szirtes, Ignác	Schröder Károly: Mértani szerkesztéstan. [Károly Schröder: Contructions in geometry.].	84-87	Book/Journal Reviews	Geometry
12.	1878	Dr. Császár, Károly	Krisz Ferenc: Szerkesztő síkmértan. [Ferenc Krisz: Constructing in plane geometry.].	116-119	Book/Journal Reviews	Geometry
12.	1878	Czehe, Győző	Szabó Ignácz: Szemléltető alaktan. [Ignácz Szabó: The study of shapes.].	245 – 250	Book/Journal Reviews	Geometry
12.	1878	Czógler, Alajos	Dr. Láng István: Elemző betűszámtan. [Dr. István Láng: Analysis of Algebra.].	305-308	Book/Journal Reviews	Algebra
12.	1878	Czógler, Alajos	Dr. Láng István: A felsőbb mennyiségtan alapelemei. [Dr. István Láng: The basic elements of higher mathematics.].	308-310	Book/Journal Reviews	Algebra
12.	1878	Mauritz, Rezső	Mauritz Rezső: Közönséges számtanom első füzetéhez. [Rezső Mauritz: For my first booklet of ordinary arithmetic.].	403	Book/Journal Reviews	Arithmetic
13.	1879	Dr. Wohlråb, Flóris	Az arányosság tényezője. [Proportionality.].	261-266, 299- 302	Teaching method	Arithmetic
13.	1879	Suppán, Vilmos	Új módszer sugárfelületek síkmetszetének meghatározására. [New method for determining the cross section of surfaces.].	515-517	Teaching method	Geometry
13.	1879	Suppán, Vilmos	A körárnyék tengelyeinek meghatározása. [Determining the shadow of the circle.].	518-519	Teaching method	Geometry
13.	1879	Dr. Walla, Ferencz	Tételek és megfordításuk. Indukció a mathematikában. [Theorems and its converses. Induction in mathematics.].	536-543	Teaching method	Algebra
13.	1879	Dr. Császár, Károly	Dr. Kőnig Gyula: Algebra. [Dr. Gyula Kőnig: Algebra.].	116-121	Book/Journal Reviews	Algebra
13.	1879	Szirtes, Ignác	Suppán Vilmos: Ábrazoló geometria. [Vilmos Suppán: Descriptive Geometry.].	242	Book/Journal Reviews	Geometry
14.	1880	Németh, Kelemen	A rajzoló geometria tanításának új terve. [A new plan for teaching drawing geometry.].	113-120, 138	Curriculum	Geometry
14.	1880	Suppán, Vilmos	A rajzoló geometria kérdéséhez. [To the question of drawing geometry.].	241-248	Teaching method	Geometry
14.	1880	Pap, Lajos	Megjegyzések Czógler Alajos úrnak Fourier hővezetési tételére vonatkozó elemi levezetésére. [Remarks on the proof of the Fourier heat conduction theorem by Mr. Alajos Czógler.].	319-320	Other	Algebra

Volume	Year	Author	Title	Pages	Category	Subcategory
14.	1880	Dr. Lutter, Nándor	Dr. Kőnig Gyula: Algebra a középtanodák felső osztályai számára. [Dr. Gyula Kőnig: Algebra for upper secondary schools.].	386-393.	Book/Journal Reviews	Algebra
14.	1880	Dr. Kőnig, Gyula	Néhány szó a gymnáziumi tantervről, "Algebrám"- ról és dr. Lutter Nándor úr bírálatáról. [A few words about the high school curriculum, my "Algebra" and on the criticism of Dr. Nándor Lutter.].	520-524, 545-549	Book/Journal Reviews	Algebra
14.	1880	Dr. Lutter, Nándor	Megjegyzések dr. Kőnig Gyula úr ellenbirálatára. [Comments on the countercriticism of Dr. Gyula Kőnig.].	549-552	Book/Journal Reviews	Algebra
14.	1880	Dr. Császár, Károly	Vész Ármin János: A felsőbb mennyiségtan alapvonalai. [Ármin János Vész: The basic concepts of higher mathematics.].	607-610	Book/Journal Reviews	Algebra
14.	1880	Landau, Alajos	Felvilágosítás - Suppán Vilmos: A rajzoló geometria kérdéséhez. [Enlightenment - Vilmos Suppán: To the question of drawing geometry.].	300	Teaching method	Geometry
15.	1881	Dr. Wohlråb, Flóris	A rajzoló geometria bírálata. [Criticism of drawing geometry.].	12 -26, 57-58, 73-82, 155-163, 191-194, 318-322, 344-350, 377-381, 415-420, 443-445	Curriculum	Geometry
15.	1881	Szirtes, Ignácz	Másodrendü felület síkmetszésére és ennek pólusára vonatkozó feladvány megfejtése. [Solve a problem with second-degree graphs.].	247-251	Teaching method	Geometry
15.	1881	Szabó, Ignácz	A svệd próba. [The Swedish test.].	438-443	Other	Arithmetic
15.	1881	Reif, Jakab	Ereky Alfonz: Mérték-, súly-, és pénzịsmẹret. [Alfonz Ereky: Measurement of weight and money.].	194-195.	Book/Journal Reviews	General
15.	1881	Dr. Wohlråb, Flóris	Cantor Moritz: Vorlesungen über Geschichte der Mathematik. [Cantor Moritz: Lectures on the History of Mathematics.].	481-486	Book/Journal Reviews	General
16.	1882	Dr. Wohlråb, Flóris	A kör kerületének meghatározása. [Determining the perimeter of the circle.].	140-141	Teaching method	Geometry
16.	1882	Suppán, Vilmos	Adalékok a számvetés oktatásához a középiskolában. [Additional materials to teach mathematics in high school.].	355-362, 436-439	Teaching method	Arithmetic
16.	1882	Dr. Wohlråb, Flóris	Suppan Vilmos: Számtan. [Vilmos Suppan: Arithmetic.].	533-545, 574.-585, 609-620	Book/Journal Reviews	Arithmetic
17.	1883	Baló, Gyula	Az irrationális szám ismertetése az V. osztályban. [Describing irrational numbers in 5th grade].	232-236	Teaching method	Algebra
17.	1883	Szutrély, István	Néhány szó a háromszögtan alapvetéséhez. [A few words on the basics of triangulation.].	292-293	Teaching method	Algebra

Volume	Year	Author	Title	Pages	Category	Subcategory
17.	1883	Kiss E. János:	A kúpmetszések és másodrendű görbék azonosságát szemléltető műszer (2 képpel). [Instrument illustrating the conic sections and second-degree curves (with 2 images)].	513-519	Teaching method	Geometry
17.	1883	Beke, Manó	A másodrendű görbék egyenleteinek jellegéről. [On the nature of the equation of second-degree curves.].	519-521	Teaching method	Geometry
17.	1883	Mauritz, Rezső	A reáliskolai tanterv kérdése. [Discussion of the real school curriculum.].	174-180	Curriculum	General
17.	1883	Suppán, Vilmos	Számtanomról. [About my arithmetic.].	243-246	Book/Journal Reviews	Arithmetic
17.	1883	Dr. Schmidt, Ágost	Močnik -Klamarik-Wagner: Geometria. [Močnik-Klamarik-Wagner: Geometry.].	360-362	Book/Journal Reviews	Geometry
17.	1883	Ferenczy, József	Reáliskolai tanterv. [Real School Curriculum.].	423-434	Curriculum	General
18.	1884	Dr. Szekeres, Kálmán	A mathematika tanításáról a gymnasiumban. [About teaching mathematics in the gymnasium.].	93-97	Teaching method	General
18.	1884	Szirtes, Ignácz	Az ábrázoló geometria az új tantervben. [Descriptive geometry in the new curriculum.].	146-149	Curriculum	Geometry
18.	1884	Riedl, Frigyes	A reáliskolai utasítások tervezetéről - az utasításokról általában. [About the draft real school instructions - about the instructions in general.].	325-328	Curriculum	General
18.	1884	Császár, Károly	A reáliskolai utasítások tervezetéről - Mathematika. [About Draft Real School Instructions - Mathematics.].	389-394	Curriculum	General
19.	1885	Kiss, E. János	Adatok a stereographicus projectio tanításához (képekkel). [Data for teaching stereographic projections (with pictures).].	284-289	Teaching method	Geometry
19.	1885	Dr. Wagner, Alajos	Mauritz Rezső: Közönséges számtan. [Rezső Mauritz: Ordinary arithmetic.].	129-131	Book/Journal Reviews	Arithmetic
19.	1885	Unknown Author	Kiss E. János: A geometriai alaktan elemei. [János E. Kiss: Elements of geometric morphology.].	187	Book/Journal Reviews	Geometry
19.	1885	Dr. Bẹke, Manó	Kőnig Gyula: Analízis. [Gyula Kőnig: Analysis.].	241-246	Book/Journal Reviews	Algebra
19.	1885	Brassai, Sámuel	Brassai Sámuel: Algebrai gyakorlatok I, II. [Samuel Brassai: Algebraic Exercises I, II.].	300-305, 355-362	Book/Journal Reviews	Algebra
19.	1885	Szutrély, István	Gerevich Emil: A lefelé menő láncztörtekről. [Emil Gerevich: About fractions and decimals.].	559-560	Book/Journal Reviews	Arithmetic
20.	1886	Kreybig, Lajos	A geometriai rajzoktatás tekintettel az alaki képzésre. [Geometric drawing education with regard to the introduction of shapes.].	224-233	Teaching method	Geometry
20.	1886	Dr. Wohlråb, Flóris	Egy közérdekű indítvány. [A motion of public interest.].	367	Teaching method	Geometry
20.	1886	Rucsinszki, Lajos	Méternégyzet és társai. [Square meters and others.].	428	Teaching method	Geometry
20.	1886	Dr. Wohlråb, Flóris	A néma számok érdekében. [For the sake of silent numbers.].	646-651	Teaching method	Algebra

Volume	Year	Author	Title	Pages	Category	Subcategory
20.	1886	Szemethy, Béla	Mendlik Ferencz - dr. Schmidt Á: Rajzoló geometria. [Mendlik Ferencz - dr. Schmidt Á: Drawing geometry.].	440-443	Book/Journal Reviews	Geometry
20.	1886	Dr. Bęke, Manó	König Gyula: Analizis. Bevezetés a mathematika rendszerébe. [Gyula Kőnig: Analysis. Introduction to the system of mathematics.].	733-739	Book/Journal Reviews	Algebra
20.	1886	Dr. Ormay, Lajos	Dr. Fr. Rheidt. Anleitung zum mathem Unterricht. - Útmutató a matematika órákhoz. [Dr. Fr. Rheidt. Instructions for teaching mathematics.].	305-307	Book/Journal Reviews	Algebra
20.	1886	Lukácsi, György	Miként lehet valamely algebrai kifejezésnél egyszerre több rekeszjelet elhagyni? - Zeitschrift für matematischen und naturwissenachaftlichen Unterricht cikke alapján. [How do I omit multiple punctuation marks for an algebraic expression at once? - Based on the article "Journal of Mathematics and Science Education".].	238	Book/Journal Reviews	Algebra
21.	1887	Dr. Beke, Manó	A számtani oktatás kérdéséhez. [To the question of arithmetic education.].	83-95	Teaching method	General
21.	1887	Dr, Beke, Manó	Suppán Vilmos: Számtan. [Vilmos Suppán: Arithmetic.].	242-43	Book/Journal Reviews	Arithmetic
21.	1887	Bournáz, János	Dr. Veress Vilmos: Kereskedelmi számtan. [Dr. Vilmos Veress: Commercial Arithmetic.].	623-624	Book/Journal Reviews	Arithmetic
22.	1888	Dr. Demeczky, Mihály	Középiskolai mathematika tanításunkhoz. [For teaching our high school mathematics].	437-445	Curriculum	Arithmetic
22.	1888	Bogyó, Samu	A röviditett osztás tanítása. [Teaching abbreviated division.].	508-511	Teaching method	Arithmetic
22.	1888	Suppán, Vilmos	Dr. Császár Károly: Korlátolt pontosságú számvetés. [Dr. Károly Császár: Mathematics with limited accuracy.].	113-114	Book/Journal Reviews	Arithmetic
22.	1888	Dr. Gerevich, Emil	Ferenczi József: A determinánsok alkalmazása. [József Ferenczi: The application of determinants.].	305-307	Book/Journal Reviews	Algebra
22.	1888	Bogyó, Samu	Havas Miksa: Kereskedelmi és politikai számtan. I rész. [Miksa Havas: Commercial and Political Arithmetic. Part I.].	307-309	Book/Journal Reviews	Arithmetic
22.	1888	Dr. Gerevich, Emil	Ferenczi József: Előiskola a Hamilton-féle quaterniók elméletéhez. [József Ferenczi: Introduction to the theory of Hamiltonian quaternions.].	582-585	Book/Journal Reviews	Algebra
23.	1889	Czógler, Alajos	Az absolut mértékek rendszere a középiskolában. [The system of absolute values in high school.].	384-388	Teaching method	General
23.	1889	Dr. Demeczky, Mihály	A mathematika methodikájához. [To the methodology of mathematics.].	459- 462	Teaching method	Algebra
23.	1889	Dr. Császár, Károly	Orbók Mór: Számolókönyv I, II. [Mór Orbók: Arithmetic I, II.].	478-482	Book/Journal Reviews	Arithmetic
24.	1890	Schmidt, János	A számtan rendszeres tanításához középiskoláinkban. [To teach mathematics regularly in our high schools.].	312-315	Teaching method	Arithmetic

Volume	Year	Author	Title	Pages	Category	Subcategory
24.	1890	Dr. Gerevich, Emil	Békési Gyula és Illés Gyula: Közönséges számtan. [Gyula Békési and Gyula Illés: Ordinary arithmetic.].	189- 193	Book/Journal Reviews	Arithmetic
24.	1890	Bogyó, Samu	Dr. Beke Manó: Algebra. [Dr. Manó Beke: Algebra.].	257-259	Book/Journal Reviews	Algebra
24.	1890	Hornischek, Henrik	Kiss E. János: Constructiv planimetria. [János E. Kiss : Constructive planimetry.].	482-484	Book/Journal Reviews	Geometry
24.	1890	Reif, Jakab	Novák Sándor: Könyvviteltan reáliskolák számára. [Sándor Novák: Accounting for real schools.].	484- 485	Book/Journal Reviews	Arithmetic
24.	1890	Dr. Beke, Manó	Friedrich Unger: Die Methodik der praktischen Arithmetik. [Friedrich Unger: The Methodology of Practical Arithmetic.].	327	Book/Journal Reviews	Arithmetic
25.	1891	Dr. Beke, Manó	A kör kerülete. [The perimeter of the circle.].	211-212	Teaching method	Algebra
25.	1891	Bogyó, Samu	A középhatáridő számítás tanítása. [Teaching the calculation of the mean time.].	426- 427	Teaching method	Algebra
25.	1891	Dr. Beke, Manó	Mathematika. [Mathematics].	767- 770	Curriculum	General
25.	1891	Hornischek, Henrik	Ábrázoló geometria. [Descriptive geometry.].	826-828	Curriculum	Geometry
25.	1891	b.	Programm-értekezések: Mathematika. [Program Dissertations: Mathematics.].	303-305	Curriculum	General
25.	1891	Dr. Beke, Manó	Mathematikai és Physikai Lapok. [Journals od Mathematics and Physics.].	214- 216	Book/Journal Reviews	General
25.	1891	Hornischek, Henrik	Kiss E. János: Gyakorlati ábrázoló geometria. [János E. Kiss: Practical descriptive geometry.].	683-686	Book/Journal Reviews	Geometry
25.	1891	Dr. Demeczky, Mihály	Dr. Fodor László: Az ábrázoló geometria elemei. [Dr. László Fodor: Elements of descriptive geometry.].	745- 746	Book/Journal Reviews	Geometry
25.	1891	Dr. Beke, Manó	Johann G. Hagen: Synopsis der höheren Mathematik. [Johann G. Hagen: A Synopsis of Higher Mathematics.].	216-217	Book/Journal Reviews	General
26.	1892	Dr. Bozóky, Endre	Az ábrzázoló geometria az egységes középiskolában. [Descreptive geometry in the unified high school.].	103-113	Curriculum	Geometry
26.	1892	Mendlik, Ferencz	A tizes számrendszer. [The decimal system.].	462-463	Teaching method	Arithmetic
26.	1892	Czógler, Alajos	Infinitesimalis elemek a középiskolai oktatásban. [Infinitesimal elements in secondary education.].	598- 603	Curriculum	Algebra
26.	1892	Mendlik Ferencz	Határidő-számolás egyszerű kamatszámolással. [Deadline calculation with simple interest.].	657-661	Teaching method	Arithmetic
26.	1892	Balogh, Mór	Beke Manó: Számtan. [Manó Beke: Arithmetic.].	289-290	Book/Journal Reviews	Arithmetic
26.	1892	Gúta, József	Suppán Vilmos: Számtan. [Vilmos Suppán: Arithmetic.].	292-293	Book/Journal Reviews	Arithmetic
26.	1892	Kreybig, Lajos	Dr. Klug Lipót: Az ábrázoló geometria elemei. [Dr. Lipót Klug: Elements of descriptive geometry.].	718-720	Book/Journal Reviews	Geometry

Volume	Year	Author	Title	Pages	Category	Subcategory
27.	1893	Szontágh, Gusztáv	A mathematika és physikai tanítás kapcsolata. [The relationship between teaching mathematics and physics.].	205-209	Curriculum	General
27.	1893	M.R. (Mauritz, Rezső?)	Beke-Reif, Kövi: Mathematikai feladatok. [Beke-Reif, Kövi: Mathematical Problems.].	496	Book/Journal Reviews	General
28.	1894	Medveczky, István	Ungvári kör - A mathematika és physika tanítása. [Uzhhorod Circle - Teaching Mathematics and Physics.].	464, 594-598	Other	General
28.	1894	Medveczky, István	A mathematika és physika tanítása a középiskolában és az egyetemen. [Teaching mathematics and physics in high school and university.].	480-481	Curriculum	General
28.	1894	Rados, Ignácz	Trigonometria tanítása. [Teaching trigonometry.].	378	Other	Algebra
28.	1894	Unknown Author	A mathematikai és physikai társulat versenye. [Competition of the Mathematical and Physical Society.].	108-110	Other	General
28.	1894	Medveczky, István	dr. Gerevich Emil és Orbók Mór: Számtan. [dr. Emil Gerevich and Mór Orbók: Arithmetic.].	140-141	Book/Journal Reviews	Arithmetic
29.	1895	Szirtes, Ignácz	A geometriai kiállítás. [The geometric exhibition.].	728-735	Other	Geometry
29.	1895	Unknown Author	Érettségi vizsgálatot tett tanulók mathematikai versenye. [Mathematics competition for students taking a maturity exam.].	302, 748	Other	General
30.	1896	Mendlik, Ferencz	A mathematikai kifejezések fogalmazása. [Formulating mathematical terms.].	123-128	Teaching method	Algebra
30.	1896	Emődi	A mathematikai kifejezések fogalmazásához. [To formulate mathematical terms.].	144	Teaching method	Algebra
30.	1896	Mendlik, Ferencz	A mathematikai fogalmazás (Emődi megjegyzéséhez). [The mathematical formulation (for Emődi's remark).].	169	Teaching method	Algebra
30.	1896	Brassai, Sámuel	A mathematikai kifejezésekről. [About mathematical terms.].	250-253	Teaching method	Algebra
30.	1896	Mendlik, Ferencz	A mathematikai kifejezések fogalmazása. [Formulating mathematical terms.].	351-354	Teaching method	Algebra
30.	1896	Egy mathematikus tanár - Rados, Ignácz	Hornischek Henrik: A geometriai oktatás újabb módszereiről és a középiskolai tanterv revisiója. [Henrik Hornischek: On New Methods in Geometry Education and the Revision of the High School Curriculum.].	322-323	Book/Journal Reviews	Geometry
30.	1896	Horneschik, Henrik	Válasz (A geometriai oktatás újabb módszereiről és a középiskolai tanterv revisiója book review-hoz). [Answer - On newer methods of geometry education and revision of the high school curriculum.].	405-406	Book/Journal Reviews	Geometry
30.	1896	Rados, Ignácz	Nyilatkozat Horneschik Henrik cikkére. [Statement on the article by Henrik Horneschik.].	429-430	Book/Journal Reviews	Geometry
30.	1896	Scmidt, Ágoston	Segédkönyv a számtani oktatás élénkítésére (könyv: dr. Molnár István Magyar Államszámviteltan). [Handbook for revitalizing arithmetic	426-427	Book/Journal Reviews	Arithmetic

Volume	Year	Author	Title	Pages	Category	Subcategory
			education (book: Dr. István Molnár Hungarian Public Accounting).].			
30.	1896	Szemethy, Béla	Grünwald Miksa: Algebra a középiskolák számára. [Miksa Grünwald: Algebra for High Schools.].	492-493	Book/Journal Reviews	Algebra
30.	1896	Dr. Bozóky, Endre	Horneschik Henrik: A kinematikai geometria alapvonalai. [Henrik Horneschik: Basic Geometry in Kinematic.].	719-720	Book/Journal Reviews	Geometry
30.	1896	Unknown Author	A maturusok mathematikai versenyének tételei. [Problem sets of the mathematical competition of matures.].	103, 119	Other	General
30.	1896	Unknown Author	A mathematikai verseny eredménye. [The result of a mathematical competition.].	188	Other	General
30.	1896	Unknown Author	Középiskolai mathematikai lapok. [The mathematics journal for secondary schools.].	294	Book/Journal Reviews	General
31.	1897	Szirtes, Ignácz	A rajzoló és ábrázoló geometria tanítása Szász-, Porosz-, és Bajorországban. [Teaching drawing and descriptive geometry in Saxony, Prussia, and Bavaria.].	594-599, 606-611	Curriculum	Geometry
31.	1897	Szirtes, Ignácz	A mathematika, geometria és szabadkézi rajz a revideált tantervben. [Mathematics, geometry and freehand drawing in the revised curriculum.].	722-725	Curriculum	Geometry
31.	1897	Rados, Ignácz	A mathematikai tantárgyak terve a közoktatási tanács állandó bizottságának jelentésében. [The plan for mathematics subjects in the report of the Standing Committee of the Public Education Council.].	765- 768	Curriculum	Geometry
32.	1898	Szirtes, Ignácz	A mathematikai tantárgyak tanterve a közoktatási tanács javaslatában. [Curriculum for mathematics subjects as proposed by the Public Education Council.].	93-96	Curriculum	Geometry
32.	1898	Szirtes, Ignácz	Kreybig Lajos: A rajzoló geometria. [Lajos Kreybig: The Drawing Geometry.].	415	Book/Journal Reviews	Geometry
33.	1899	Kreybig, Lajos	Klug Lipót: Ábrázoló geometria. [Lipót Klug: Descriptive geometry.].	592	Book/Journal Reviews	Geometry
34.	1900	Szemerjay, Károly	A mathematikai verseny eredménye. [The result of a mathematical competition.].	230	Other	General
34.	1900	László, Ignác	Érettségit tett tanulók mathematikai versenyei. {Mathematics competitions for high school graduates.].	147	Other	General
35.	1901	Szirtes, Ignácz	Sárkány Lajos: Mértan. [Lajos Sárkány: Geometry.].	334-335	Book/Journal Reviews	Geometry
35.	1901	Unknown Author	Ábrázoló mértani cursus gymnásiumban. [Descriptive geometry class in gymnasium.].	495-496	Curriculum	Geometry
36.	1902	Mikola, Sándor	A számtantanítás gyakorlati berendezéséről. [On the practical teaching of mathematics.].	493-497, 514-518	Teaching method	Arithmetic

Volume	Year	Author	Title	Pages	Category	Subcategory
36.	1902	László, Ignác	A számtan tanításról. [About teaching mathematics.].	685-690	Teaching method	Arithmetic
37.	1903	Mikola, Sándor	Reformmozgalmak a matematika tanítása terén Angliában. [Reform movements in the teaching of mathematics in England.].	197-202	Teaching method	General
37.	1903	Virány, Gy.	A felső osztályok mennyiségtani tanításához. [For the mathematics teaching in upper grades.].	274	Curriculum	General
37.	1903	László, Ignác & Faragó, Andor	A felső osztályok mennyiségtani tanításához. [For the mathematics teaching in upper grades.].	334-338	Curriculum	General
37.	1903	Barcsa, János	A nyelvtani és matematikai műszók egységéről. [On the unity of grammatical and mathematical terms.].	398-400	Curriculum	General
37.	1903	T.M.	A mennyiségtani érettségi tételek. [Problems on matehmatics maturity exam.].	600-601	Curriculum	General
37.	1903	László, Ignác	Rátz László: Matematikai gyakorlókönyv. [László Rátz: Mathematical exercise book.}.	124-126	Book/Journal Reviews	General
38.	1904	Dr. Goldziher, Károly	Rátz László: Matematikai gyakorlókönyv. [László Rátz: Mathematical exercise book.].	127-129	Book/Journal Reviews	General
38.	1904	Unknown Author	Paul Stackel: Die Notwendigkeit regelmäßiger Vorlesungen über Elementarmathematik and den Universitäten (Monatsschrift für höhere Schulen) [Paul Stackel: The need for regular mathematics lectures at universities (monthly in higher education)].	391	Book/Journal Reviews	General
38.	1904	Sós, Ernő	Dr. A Sturm: Geschichte der Mathematik. [Dr. A Sturm: A History of Mathematics.].	518	Book/Journal Reviews	General
38.	1904	Unknown Author	Dr. Irving Fisher - N. Pinkus: Kurze Einleitung in die Differential- und Integralrechnung. [Dr. Irving Fisher - N. Pinkus: A Brief Introduction to Differential and Integral Calculus].	574	Book/Journal Reviews	Algebra
38.	1904	Rados, Ignác	F. Klein: Über eine zeitgemasse Umgestaltung des math. Unterrichts and den höhere Schulen. [F. Klein: On the reorganization of mathematics lessons in higher education institutions.].	616	Book/Journal Reviews	General
39.	1905	Faragó, Andor	A trigonometria tanításához. [To teach trigonometry.].	364- 367	Teaching method	Algebra
39.	1905	Dr. Goldziher, Károly	A számtan tanításának tárgyi körei. [Subject areas of teaching arithmetic].	591- 593	Teaching method	Arithmetic
39.	1905	Szőke, Béla	A trigonometria tanításáról. [On the teaching of trigonometry.].	716-719	Teaching method	Algebra
39.	1905	Miklóssy, István	Die Anfangsgründe der Differentialrechnung und Integralrechnung. [The beginnings of differential calculus and integral calculus.].	334	Book/Journal Reviews	Algebra
40.	1906	Dr. Beke, Manó	A mathematika tanítás reformja. [Reform of the mathemtics teaching.].	90-96	Curriculum	General

Volume	Year	Author	Title	Pages	Category	Subcategory
41.	1907	Dr. Goldziher, Károly	A mathematikai laboratóriumról. [About the Mathematical Laboratory.].	453- 455	Teaching method	General
41.	1907	Dr. Goldziher, Károly	Grafikai módszerek a számtani oktatásban. [Graphic methods in mathematics education.].	770- 776	Teaching method	Algebra
41.	1907	Unknown Author	G. Gutsche: Mathematische Übungsaufgaben. [G. Gutsche: Mathematical Exercises.].	204	Book/Journal Reviews	Algebra
41.	1907	Dr. Goldziher, Károly	Haumer E.: Lehr- und Handbuch der ebenen und sphärischen Trigonometrie. [Haumer E.: Guidance and Manual for Plane and Spherical Trigonometry.].	295	Book/Journal Reviews	Algebra
41.	1907	M. S. (talan Mikola?)	Beke Manó: Bevezetés a differenciál- és integrálszámításba. [Manó Beke: Introduction to differential and integral calculus.].	584-585	Book/Journal Reviews	Algebra
42.	1908	Kacsóh, Pongrác	Néhány szó az új osztrák tantervről a matematikai és fizikai tanítás szempontjából. [A few words about the new Austrian curriculum in terms of teaching mathematics and physics.].	717- 720	Curriculum	General
42.	1908	Dr. Goldziher, Károly	Oskar Lesser: Graphische Darstellungen der Mathematikunterricht der höheren Schulen. [Oskar Lesser: Graphical representations of mathematics lessons in high schools.].	208	Book/Journal Reviews	Algebra
42.	1908	Dr. Goldziher, Károly	F. Klein: Elementarmathematik. [F. Klein: Basic Mathematics.].	506	Book/Journal Reviews	Algebra
43.	1909	Mikola, Sándor	A matematika tanítás reformja. [Reform of mathematics teaching.].	p 10-15	Curriculum	General
43.	1909	Mende, Jenő	Megjegyzések Fröhlich Károlynak “Az alsófokú számtani oktatás célszerű berendezéséről” írt cikkéhez. [Comments on Károly Fröhlich's article on the appropriate methods for primary arithmetic education.].	650-654	Curriculum	General
43.	1909	M-r	A matematikai oktatás nemzetközi szervezése. [International organization of mathematics education.].	285-286	Curriculum	General
43.	1909	Habán, Mihály	Beke Manó és Mikola Sándor: A középiskolai matematikai tanítás reformja. [Manó Beke and Sándor Mikola: The Reform of Secondary School Mathematics Teaching.].	149-153	Book/Journal Reviews	General
43.	1909	Dr. Goldziher, Károly	Dr. W. Lietzmann: Stoff and Methode im mathematichen Unterricht. [Dr. W. Lietzmann: Materials and Methods in Mathematics Classes.].	412	Book/Journal Reviews	General
44.	1910	Unknown Author	A mathematikai oktatás nemzetközi bizottságának ülése. [Meeting of the International Commission on Mathematical Education.].	668	Other	General
44.	1910	Szirtes, Ignác	Lenkei Lehel: Segédeszköz az ábrázoló mértan modern tanításához. [Lenkei Lehel: An aid to the modern teaching of descriptive geometry.].	166-167	Book/Journal Reviews	Geometry

Volume	Year	Author	Title	Pages	Category	Subcategory
44.	1910	Rados, Ignác	Dr. Beke Manó: Differenciál- és integrálszámítás. [Dr. Manó Beke: Differential and integral calculus.].	378- 381	Book/Journal Reviews	Algebra
44.	1910	Matematikus	Rátz-Mikola: Az infinitezimális számítások elemei a középiskolában. [Rátz-Mikola: Elements of infinitesimal calculations in high school.].	383-385	Book/Journal Reviews	Algebra
44.	1910	Dr. Goldziher, Károly	Schultze: Grafik Algebra. [Schultze: Graphic Algebra.].	616	Book/Journal Reviews	General
45.	1911	Rados, Ignác	Egy külföldi ítélet a matematikai reformbizottság munkájáról: Gino Loria cikke a Bollettino-ban. [A Foreign Judgment on the Work of the Mathematical Reform Commission: Article by Gino Loria in Bollettino.].	797-798, 938	Other	General
45.	1911	Dr. Goldziher, Károly	Mathematisches Unterrichtswerk. [Mathematics teaching work.].	457	Book/Journal Reviews	General
45.	1911	Dr. Goldziher, Károly	Witting: Mathematische Bibliothek. [Witting: Mathematical library.].	616	Book/Journal Reviews	General
46.	1912	Rátz, László	Az infinitezimális számítások bevezetésének kérdései. [The issue of introducing infinitesimal calculations.].	250-251	Curriculum	Algebra
46.	1912	Habán, Mihály	A matematika oktatás reformjáról. [On the reform of mathematics education.].	282-297	Curriculum	General
46.	1912	Dr. Goldziher, Károly	Gyakorlati szempontok a matematika tanításban. [Practical aspects in teaching mathematics.].	298-302	Curriculum	General
46.	1912	Mikola, Sándor	Jelentés a matematikai reformbizottság kérdéseire beérkezett feleletekről. [Report on the results of the survey of the Mathematical Reform Commission.].	341-350	Curriculum	General
46.	1912	Dr. Goldziher, Károly	A kereskedelmi számtan tanítása a középiskola alsó osztályaiban. [Teaching commercial arithmetic in the lower grades of high school.].	408-412	Teaching method	Arithmetic
46.	1912	Mikola, Sándor	A matematikai szakosztály üléseinek krónikája. [Chronicle of the meetings of the mathematics department.].	443-446	Curriculum	General
46.	1912	Dr. Visnya, Aladár	Tájékoztató a "Matematikai Oktatás Nemzetközi Bizottsága" hazai és külföldi albizottságainak működéséről. [Information on the operation of the domestic and foreign subcommittees of the "International Commission for Mathematical Education".].	447-455	Curriculum	General
46.	1912	Kovács, J. Kandid	Grész leó: Algebra és geometria. [Grész leó: Algebra és geometria.].	421-422	Book/Journal Reviews	General
47.	1913	Mikola, Sándor	A matematikai tanítás kongresszusa Párizsban 1914 április 6-8-ig. [Congress of Mathematical Teaching in Paris from 6 to 8 April 1914.].	171-175	Curriculum	General
47.	1913	Beke, Manó & Mikola, Sándor	Felhívás a matematika tanáraihoz. [A call to mathematics teachers.].	175	Curriculum	General

Volume	Year	Author	Title	Pages	Category	Subcategory
47.	1913	Unknown Author	Nemzetközi értekezlet a matematika tanítás ügyében. [International Conference on the Teaching of Mathematics.].	499-501	Curriculum	Algebra
47.	1913	Szabó, Péter	Smith and Goldziher: Bibliography of the Teaching Mathematics.	81	Book/Journal Reviews	General
47.	1913	Dr. Goldziher, Károly	Greve: Logartihmische und trigonometrische Tafeln. [Greve: Logarithmic and trigonometric tables.].	862	Book/Journal Reviews	General
48.	1914	------	------	------	------	------
49.	1915	------	------	------	------	------
50.	1916	------	------	------	------	------
51.	1917	Dr. Goldziher, Károly	Abonyi József: A közönséges trigonometrikus számok ötjegyű logaritmusai, antilogaritmusok és egyéb táblázatok. [József Abonyi: Five-digit logarithms, antilogarithms and other tables of ordinary trigonometric numbers.].	691-692	Book/Journal Reviews	Algebra
52. - 53.	1918, 1919	------	------	------	------	------
54. - 55.	1920, 1921	------	------	------	------	------
56.	1922	------	------	------	------	------
57.	1923	------	------	------	------	------
58.	1924	Dr. Goldziher, Károly	Oltay Károly: Logarithmuskönyv négy számjeggyel. [Károly Oltay: Logarithm book with four digits.].	260-261	Book/Journal Reviews	Algebra
59	1925	Dr. Sárközy, Pál	Pillanatfölvételek a mennyiségtan jelenlegi állásáról. [Snapshots of the current state of mathematics.].	318-323	Curriculum	Algebra
59	1925	Unknown Author	Középiskolai Mathematikai és fizikai lapok.	193	Book/Journal Reviews	General
60.	1926	Mende, Jenő	Nagy József: Kiváló mathematikusok és filozofusok. [József Nagy: Excellent mathematicians and philosophers.].	295-296	Book/Journal Reviews	General
61.	1927	------	------	------	------	------
62.	1928	Loczka, Lajos	Az amerikai középiskolák főbb tantárgyainak anyaga. [Material for major subjects in American high schools.].	266-271, 355-360	Curriculum	General
62.	1928	M.J. - Mende Jenő	Dr. Sós Ernő: Mathematikai kísérletek egyszerű eszközökkel. [Dr. Ernő Sós: Mathematical experiments with simple tools.]	73	Book/Journal Reviews	Geometry
63.	1929	Erdős, Lajos	Kürschák József: Mathematikai versenytételek. [József Kürschák: Mathematical competition problems.].	203-205	Book/Journal Reviews	General
63.	1929	Rados, Ignác	Gáspár Ilona: A magyar matematikai irodalom bibliográfiája. [Ilona Gáspár: Bibliography of Hungarian mathematical literature.].	424	Book/Journal Reviews	General
64.	1930	------	------	------	------	------
65.	1931	------	------	------	------	------
66.	1932	------	------	------	------	------
67.	1933	------	------	------	------	------

Volume	Year	Author	Title	Pages	Category	Subcategory
68.	1934	Kornis, Gyula	A matematikai tanfolyam megnyitása. [Opening a mathematics course.].	37-38	Curriculum	General
68.	1934	dr. Tóth, Géza	Vitaest a infinitézimális számítás módszeres tanításáról. [Debate on the methodical teaching of infinitesimal.].	80-85	Curriculum	Algebra
68.	1934	Manger, Emil	Beszámoló a budapesti országos középiskolai tanárképző intézet matematikai továbbképző tanfolyamáról. [Report on the mathematics in-service training course of the National Secondary School Teacher Training Institute in Budapest.].	166-172	Curriculum	General
68.	1934	F I.	Dr. Ferenczi Zoltán: Differenciál- és integrálszámítás középiskolák számára. [Dr. Zoltán Ferenczi: Differential and integral calculus for secondary schools.].	146	Book/Journal Reviews	Algebra
69.	1935	Jelitai, József	Keresztesi Mária: A magyar matematikai műnyelv története. [Mária Keresztesi: The History of the Hungarian Mathematical Language.].	204-207	Book/Journal Reviews	General
69.	1935	Jelitai, József	Szász Pál: A differenciál-és integrálszámítás elemei. [Pál Szász: Elements of differential and integral calculus.].	411-413	Book/Journal Reviews	Algebra
70.	1936	Jelitai, József	Jelitai József: Matematikus-kongresszus Oslóban. [József Jelitai: Mathematical Congress in Oslo.].	57-59	Curriculum	General
70.	1936	Unknown Author	Matematika az írásbeli érettségin. [Mathematics at the written exam for high school diploma.]	394	Other	General
70.	1936	T.G. - Tóth Géza	Csűrős Zoltán: Számok csodavilága. [Zoltán Csűrős: The Wonder of Numbers.].	265	Book/Journal Reviews	General
70.	1936	Jelitai, József	Dávid Lajos: Gyakorlati differenciálgeometria. [Lajos Dávid: Practical Differential Geometry.].	266-267	Book/Journal Reviews	Algebra
70.	1936	Jelitai, József	Hárs János: Hogyan számolt magyarországi György mester 1499-ben? [János Hárs: How did Master György in Hungary count in 1499?].	416	Book/Journal Reviews	General
71.	1937	Rados, Ignác	Kerekjártó Béla: A geometria alapjairól. [Béla Kerekjártó: On the basics of geometry.].	219-220	Book/Journal Reviews	Geometry
72.	1938	------	------	------	------	------
73.	1939	------	------	------	------	------
74.	1940	------	------	------	------	------
75.	1941	Gyarmathy, László	Térszemléleti oktatás az új gimnáziumban. [Spatial education in the new gymnasium.].	231-235	Curriculum	Geometry
76.	1942	Bukovszky, Ferenc	Mennyiségtani továbbképző tanfolyam. [Mathematics training course.].	105-106	Teaching method	Algebra
76.	1942	Veress, Pál	Veress Pál: Elemi mennyiségtan magasabb szempontból. [Paul Veress: Elementary mathematics from a higher perspective.].	144	Book/Journal Reviews	Arithmetic

Volume	Year	Author	Title	Pages	Category	Subcategory
77.	1943	dr. Tóth, Géza	Mennyiségtani oktatásunk helyzetképe. [The situation of our mathematics education.].	1-8	Teaching method	Algebra
77.	1943	Bukovszky, Ferenc	Kézi pergőképek a mennyiségtan tanításában. [Flip books in mathematics teaching.].	30-33	Teaching method	Geometry
77.	1943	Veress, Pál	Szőkéfalvi Nagy Gyula: A geometriai szerkesztések elmélete. [Gyula Szőkéfalvi Nagy: Theory of geometric constructions.].	255-256	Book/Journal Reviews	Geometry
77.	1943	Maróthi, Ferenc	Zágoni Barra György: A mennyiségtan tanítása. [György Barra Zágoni: Teaching mathematics.].	256-258	Book/Journal Reviews	Algebra
78.	1944	------	------	------	------	------

Appendix C: List of Authors in *Journal of the National Association of Secondary School Teachers* Between 1867 and 1944

Authors	# of Articles	Year of First Paper	Year of Last Paper	Birth	Death	High School Teacher	Teacher Cert.	Town(s) Where He Was a Teacher	University Professor	Doctorate	Member of Hungarian Academy of Sciences
Ábel, Károly	17	1869	1875	1836	1877	Yes		Budapest			
Beke, Manó	11	1883	1906	1862	1946	Yes	1883	Budapest	Yes	1884	1914-1920 After 1945
Bogyó, Samu	4	1888	1891	1857	1928	Yes 1879-1883	Yes	Budapest			
Bozóky, Endre	2	1892	1896	1863	1925	Yes	1886	Budapest			
Brassai, Sámuel	5	1869	1896	1797	1897			Pest, Cluj-Napoca	1872-1884 -Cluj-Napoca		
Bukovszky, Ferenc	2	1942	1943	1908	1981	Yes	1931	Kőszeg, Nagykanizsa, Budapest	1953-1973 Technical University of Budapest	1935, 1963	
Császár, Károly	21	1869	1889	1842	1891	Yes	1866	Timisoara, Banská Štiavnica, Budapest, Cluj-Napoca	After 1869 University of Budapest		
Czógler, Alajos	5	1878	1892	1853	1893	Yes	Yes	Szeged, Budapest			
Demeczky, Mihály	3	1888	1891	1855	1920	Yes	1883	Oradea, Miskolc, Budapest	After 1893 University of Budapest	1877	
Éberling, József	2	1875	1876	1849	1938	Yes	1872	Budapest			
Gerevich, Emil	3	1888	1890	1854	1902	Yes	Yes	Maramures Island, Banská Bystrica, Košice		1889	
Goldziher, Károly	16	1904	1924	1881	1955	Yes	1903	Budapest	After 1911 Technical University	1904	
Habán, Mihály	2	1909	1912							1902	
Heinrich, Gusztáv	2	1869	1869	1845	1922	Yes	1871	Budapest	1878-1905 University of Budapest	1867	1880

Authors	# of Articles	Year of First Paper	Year of Last Paper	Birth	Death	High School Teacher	Teacher Cert.	Town(s) Where He Was a Teacher	University Professor	Doctorate	Member of Hungarian Academy of Sciences
Heller, Ágost	3	1870	1877	1843	1902	Yes	1868	Budapest			1887
Hornischek, Henrik	4	1890	1896	1859		Yes	1881	Novi Sad, Budapest			
Jelitai, József	5	1935	1936	1889	1944	Yes	1912	Debrecen, Budapest	After 1932 University of Debrecen After 1942 University of Budapest	1932	
Kiss, E. János	2	1883	1885	1855		Yes	1877	Budapest			
Kőnig, Gyula	1	1880	1880	1849	1913			Budapest	1871 University of Budapest 1874-1905 Technical University, 1891-93 - Rector	1871	1880
Kornis, Gyula	1	1934	1934	1885	1958	Yes	1907	Budapest	After 1914 University of Budapest	1907	1916
Kreybig, Lajos	4	1874	1899	1844		Yes	1869	Bratislava, Budapest			
Landau, Alajos	2	1876	1880	1833	1884	Yes		Szeged, Budapest	After 1876 Technical University		
László, Ignác	3	1900	1903								
Lutter, Nándor	4	1874	1880	1820	1891	Yes		Banská Štiavnica, Pest, Buda			1859
Mauritz, Rezső	8	1869	1883	1839	1902	Yes		Košice City, Pest			
Mayer, József	4	1867	1873	1839		Yes					
Medveczky, István	3	1894	1894								
Mende, Jenő	2	1909	1926	1883	1944	Yes	Yes	Cegléd, Budapest			
Mendlik, Ferenc	6	1870	1896	1838	1902	Yes	1865	Eger, Baja, Uzhhorod, Budapest			

Authors	# of Articles	Year of First Paper	Year of Last Paper	Birth	Death	High School Teacher	Teacher Cert.	Town(s) Where He Was a Teacher	University Professor	Doctorate	Member of Hungarian Academy of Sciences
Mikola, Sándor	6	1902	1913	1871	1945	Yes	Yes	Budapest			1922
Rados, Ignác	8	1894	1937	1859	1944	Yes	1883	Budapest, Odorheiu Secuiesc			
Rátz, László	1	1912	1912	1863	1930	Yes	1890	Budapest			
Reif, Jakab	3	1875	1890	1844		Yes	Yes	Budapest			
Schmidt, Ágoston	2	1883	1896	1845	1902	Yes	1871	Kecskemét, Cluj-Napoca Budapest	1874-1879 University of Cluj-Napoca	Yes	
Schröder, Károly	3	1868	1877	1840	1895	Yes		Kremnica, Budapest			
Suppán, Vilmos	8	1877	1888	1854	1933	Yes	Yes	Odorheiu Secuiesc, Budapest			
Szemethy, Béla	2	1886	1896								
Szirtes, Ignác	11	1878	1910	1850	1922	Yes	1875	Panchova, Pécs, Budapest			
Szutrély, István	2	1883	1885								
Tóth, Géza	3	1934	1943	1901	1995		1926	Budapest	From 1925 Technical University		1993
Veress, Pál	2	1942	1943	1893	1945	Yes	1919	Cluj-Napoca, Budapest	After 1928 Teacher Training Institute 1936-1939 University of Budapest	1918 - Cluj Napoca	
Wohlráb, Flóris	13	1875	1886	1853	1909	Yes	Yes	Countryside (not specified), Budapest			

Appendix D: List of Articles in *Teaching of Mathematics* Between 1953 and 1956

Volume	Year	Author	Title	Page	Category	Subcategory
1.	1953		A matematika tanítása. [Teaching mathematics.].	2,3	Other	Other
1.	1953	Központi Pedagógus Továbbképző Intézet Matematikai Tanszéke (Central Teacher Continuing Education Institute Department of Mathematics)	A matematikai továbbképzés helyzete. [Situation of further training in mathematics.].	161-162	Curriculum	Other
1.	1953	Ponomarjov /Lovas, György	A politechnikai oktatás és a matematikatanítás. [Polytechnic education and mathematics teaching.].	65-70	Curriculum	Other
1.	1953	Kárteszi Ferenc	Előszó	1	Other	Other
1.	1953	Vadas György	Politikai és erkölcsi nevelés a matematika tanításában. [Political and moral education in the teaching of mathematics.].	97-102	Curriculum	Other
1.	1953	Budapesti Pedagógus Továbbképző Intézet Matematikai Tanszéke (Budapest Teacher Continuing Education Institute Department of Mathematics)	A matematika oktatás tapasztalatai. [Experiences in mathematics education.].	3-8	Teaching method	General
1.	1953	Budapesti Eötvös Gimnázium Szakmai Munkaközössége (Budapest Eötvös High School Professional Working Community)	Éveleji ismétlés (gimnázium). [Review at the beginning of the school year (high school).].	12-15	Teaching method	Arithmetic
1.	1953	Marót, Rezső	Hogyan tanulja a tanuló a matematikát?. [How does a student learn mathematics?.].	105-106	Teaching method	Other
1.	1953	Pósa, Vilmosné	Az egyenlettanítás problémája az ú.n. "típusfeladatok" bevezetése után. [The problem of teaching equations after the introduction of the so-called "type problems".].	134-138	Curriculum	Algebra
1.	1953	Tóth, Imre	Miről beszél egy tájékozodó dolgozat?. [What is an informative test about?.].	106-109	Teaching method	Other

Volume	Year	Author	Title	Page	Category	Subcategory
1.	1953	Hódi, Endre	Egyenletek közelítő megoldása. [Approximate solution of equations.].	113-119 143-147 174-183	School Mathematics	Algebra
1.	1953	Kalmár, László	Az analízis módszerei a középiskolai tanításban. [Methods of analysis in secondary school teaching.].	22 - 32 40-50 74-79 109-112	School Mathematics	Algebra
1.	1953	Csánk, István	Két új középiskolás matematika tankönyv. [Two new high school math textbooks.].	84-86	Book review	General
1.	1953	Pogány, János	Hozzászólás a matematika tankönyvek kérdéséhez. [Comment on the question of math textbooks.].	138-143	Curriculum	General
1.	1953	Varga, Tamás	Az I. Gimnáziumi kísérleti matematika tankönyvről. [About the 1st grade Gymnasium experimental mathematics textbook.].	169-174	Book review	General
1.	1953	Bede, Lajos	A Borsod megyei matematikusok szakmai tanácskozása. [Professional meeting of mathematicians from Borsod county.].	60-64	Curriculum	Other
1.	1953	Gáspár, Gyula	A középiskolai és egyetemi matematikai oktatás közti átmenet kérdésével foglalkozó ankét. [A meeting on the issue of transition between sSecondary and university mathematics education.].	58-60	Curriculum	Other
2.	1954	Faragó, László	A IV. Osztályos függvénytani anyag tanításának előkészítése a gimnázium három első osztályában. [Preparation in the first three grades of high school to teach function in 4th gradel.].	8 és 15	Curriculum	Algebra
2.	1954	Gömböcz, Lajos	Betűegyütthatós egyenletek tanításáról. [On teaching letter coefficient equations.].	69-75	Teaching method	Algebra
2.	1954	Havas, Gyula	Számonkérés a matematika órákon. [Assessments in mathematics classes.].	33-36	Teaching method	Other
2.	1954	Hódi, Endre	A feladatmegoldások szerepe a formalizmus elleni küzdelemben. [The role of problem solving in the fight against formalism.].	101-109	Teaching method	Other
2.	1954	Juhász, Endre	A számonkérés mint a tudás mélyítésének eszköze a matematika tanításában. [Assessment as a tool to deepen knowledge in mathematics teaching .].	67-69	Teaching method	Other
2.	1954	Kozma, Péter	Egy szakkör munkájából. {From the work of a mathematics club.].	15-17	Teaching method	Other
2.	1954	Varga, Tamás	A másodfokú egyenletek tanításáról. [On the teaching of quadratic equations.].	170-176	School Mathematics	Algebra
2.	1954		Hibajegyzék Hódi Endre: Egyenletek közelítő megoldása c. cikkéhez. [List of errors for Endre Hódi's article: Approximation of Equations.].	51-52	Teaching method	Algebra
2.	1954	Reiman, István	A csoportelmélet geometriai alkalmazásáról. [On the geometric application of group theory.]	43-51	School Mathematics	Geometry
2.	1954	Surányi, Ferenc - Varga, Tamás	Az algebra alaptétele. [The basic theorem of algebra.].	109-116	School Mathematics	Algebra

Volume	Year	Author	Title	Page	Category	Subcategory
2.	1954	Késedi, Ferenc - Varga, Tamás	Milyenek legyenek a matematikai tankönyvek?. [What should mathematics textbooks look like?.].	76-80	Curriculum	Other
2.	1954	Ligeti, Béla	170 éves az első magyar nyelvű algebra. [The first Hungarian algebra is 170 years old.].	80-83	School Mathematics	Algebra
2.	1954	Obláth, Richárd	Tudós kutató középiskolai tanárok. [Famous high school teachers.].	147-149 177-181	School Mathematics	Other
3.	1955	Bori, István	A szóbeli számolás jelentősége a középiskolai matematika tanításban. [The Importance of verbal counting in teaching high school mathematics.].	76-80	Teaching method	Other
3.	1955	Faragó, László	A folyamatos ismétlés a középiskolában. [Continuous repetition in high school.].	71-75	Teaching method	Other
3.	1955	Késedi, Ferenc	A budapesti általános gimnáziumokban látogatott matematikai órák tapasztalataiból. [On the experience after visits mathematics classes in high schools in Budapest.].	136-139	Curriculum	Other
3.	1955	Reiman, István	A matematikai felvételi vizsgák néhány tapasztalata a Budapest-i Eötvös Loránd Tudományegyetemen. [Some findings about the mathematics entrance examination at Eötvös Loránd University in Budapest].	101-105	Curriculum	Other
3.	1955	Varga, Tamás	A másodfokú egyenletek tanításáról. [On the teaching of quadratic equations.].	5 - 10 33-37	School Mathematics	Algebra
3.	1955	Gádor, Endréné	A középiskolai matematika szakfelügyelők tanfolyamáról. [About the course for high school math supervisors].	139-143	Curriculum	Other
3.	1955	Hódi, Endre	A húrnégyszögekről. [About cyclic quadrilateral.].	80-85 105-114	School Mathematics	Geometry
3.	1955	Hódi, Endre	A trigonometria néhány előnyös alkalmazása. [Some preferred applications of trigonometry.].	168-183	School Mathematics	Algebra
3.	1955	Tasnádi, István	A mátrix-számítás elemei. [Elements of matrix calculation.].	11 - 17 45-53	School Mathematics	Algebra
3.	1955	Csánk, István	Milyenek legyenek a matematikai tankönyvek?. [What should mathematics textbooks look like?.].	114-117	Curriculum	Other
3.	1955	Szász, Ferenc	B.A. Kutuzov: Geometria. [B.A. Kutuzov: Geometry.].	144-146	Book review	Geometry
3.	1955	Obláth, Richárd	Beke Manó, a nagy magyar tanár (1862-1945). [Manó Beke, the great Hungarian teacher (1862-1945).].	147-151	School Mathematics	Other
4.	1956	Dux, Erik	Néhány szempont a nemnegativ számpár középértékeinek tanításához. [Some considerations for teaching the mean values of a non-negative pair of numbers.].	12 és 16	School Mathematics	Algebra

Volume	Year	Author	Title	Page	Category	Subcategory
4.	1956	Hódi, Endre	Két változós másodfokú polinomok tényezőre bontásáról. [Factoring of second degrre polynomials.].	42-49	School Mathematics	Algebra
4.	1956	Varga, Tamás	Az új I. gimnáziumi matematika - tankönyv algebrai részéről. [On the algebraic part of the new 1st grade gymnasium textbook.].	16-21	Book review	Algebra
4.	1956	Faragó, László	Az új I. gimnáziumi matematika - tankönyv geometriai részéről. [On the geometry part of the new 1st grade gymnasium textbook].	21-24	Book review	Geometry
4.	1956	Neukomm, Gyula	Az 1956. Arany Dániel versenyekről. [About the 1956 Daniel Arany competitions.].	49-52	Teaching method	Other

Appendix E: List of Authors in *Teaching of Mathematics* Between 1953 and 1956

Authors	# of Articles	Birth	Death	High school teacher	Teacher cert.	Town where he worked	University Professor	Doctorate	Member of Hungarian Academy of Sciences
Csánk, István	2			Yes		Beregszász			
Faragó, László	3	1911	1966	Yes	1933	Budapest	1933 - 1947, Pázmány Péter University	1933	
Hódi, Endre	5	1923	2003	Yes	1947	Gödöllő Budapest	Budapest College of Pedagogy		
Kalmár, László	1	1905	1976			Szeged	University of Szeged	Yes	1949
Késedi, Ferenc	2	1913	1986						
Obláth, Richárd	2	1882	1959	Yes	1905	Countryside Budapest			
Reiman, István	2	1927	2012		1953	Budapest	1953-1970 Eötvös Lóránd University of Budapest 1970-1996 Technical University of Budapest	Yes	
Varga, Tamás	6	1919	1987	Yes	Yes	Kunszentmiklós Szeged Budapest	1951-1963 Eötvös Lóránd University of Budapest	1975	