Thang Long Journal of Science p-ISSN: 3030-489X
Vanhien and Heritage B4 (No.2): 38 - 45 (2025) e-ISSN: 3030-4903

A BRIEF OVERVIEW OF THE HISTORY OF VIETNAMESE MATHEMATICS AND THE HISTORY OF MATHEMATICS TEACHING IN VIETNAM

Hà Huy Khoái[a]
Tạ Duy Phượng[b]
Alexei Volkov[c]

(Received 21 October 2025; revised 20 December 2025; accepted 29 December 2025)

Abstract

This article presents a brief overview of the history of Vietnamese mathematics and mathematics education, categorized into three main historical periods. The first period focuses on traditional mathematics during the feudal era, when mathematical knowledge primarily served administrative functions and the imperial examination system, as evidenced by the existence of distinct Han-Nom mathematical texts. The second period examines the transition during the French colonial era, marking the end of Confucian education and the introduction of Western mathematics, as well as the emergence of Vietnam's first modern mathematicians. The third period covers the period from 1945 to the present, highlighting the establishment of a comprehensive mathematics education system in Vietnamese, the formation of specialized mathematics classes, the introduction of the International Mathematical Olympiad, and significant research achievements that have integrated Vietnamese mathematics into the global community.

Keywords: history of Vietnamese Mathematics, Mathematics Education, Han-Nom Math books, traditional Mathematics, modern Mathematics

1. The history of mathematics in traditional Vietnam

The historical researcher Ta Ngoc Lien wrote about ancient Vietnamese mathematics as follows (Ta Ngoc Lien, 1979): *Today, based on archaeological documents, historical studies, and a review of the remaining ancient buildings... the ancient Vietnamese had to be well versed in mathematics, and the Vietnamese skillfully applied mathematics to life*

[a] Thang Long Institute of Mathematics and Applied Science, Thang Long University
[b] Institute of Mathematics, Hanoi; Email: tdphuong@math.ac.vn
[c] Tsinghua University, Taiwan

[...]. *Finding secret codes in forms engraved on the surface of a Dong Son drum on Dao Thinh cans* [...] *will find her knowledge of astronomy and mathematics of the ancient Vietnamese*.

The northern part of modern Vietnam formally became a province of the Han Empire (China) in the 2nd century BC. At this time, local authorities used Chinese letters for official documentation and state exams.

Vietnam gained independence from China in the 10th century. Since then, the Vietnamese have created their own administrative system, modeled heavily on the Chinese administration, and classical Chinese texts served as the primary instructional materials. Buddhism played an important role in Vietnamese education.

Quoc Tu Giam, the Imperial Academy in Vietnam, was founded in 1070. The first Imperial Examination was held in 1075. Subsequently, these examinations were typically held on a triennial basis (every three years). Successful candidates for these exams were often appointed to high positions in government bureaucracy.

Mathematical exams in Vietnam in the feudal period:

To select candidates who know how to use mathematics in the public administration system (those who know how to calculate taxes, make calendars, calculate the area of fields, ...), starting in 1077, the Vietnamese feudal authorities organized Math exams. According to historical documents, Math exams were held in 1077, 1179, 1261, 1363, 1373, 1393, 1404 (1405?), 1437, 1472, 1475, 1477, 1481, 1482, 1486, 1490. 1505, 1698, 1711, 1725, 1732, 1747, 1762, 1767, 1777, … (Pham Vu Loc et al, 2021).

Vietnamese Math books in the medieval period:

Math books appeared in response to demand to prepare for Math exams (in the feudal and early French colonial period). Books in mathematics were also necessary for land surveyors, engineers, astronomers, officials from various departments, etc. Some scientists (Luong The Vinh, Nguyen Huu Than, ...) considered mathematics to be the object of scientific study; they wrote mathematical books based on their research.

The number of ancient Vietnamese books on mathematics (written from the 15th century to the beginning of the 20th century), known so far, is 22 books, of which 13 were written only in Chinese letters (Han letters) and 9 books in mixed Han letters (Chinese letters) and Nom letters (ancient Vietnamese letters). Later we collectively call those 22 books as *Han-Nom Math books*.

The content of Han-Nom Math books:

Arithmetic and algebra: System base 10; Arithmetic calculation: addition, subtraction, multiplication, division, using a calculator. Equally or proportional division, math problems about motion, the method of finding square roots, solving systems of two or three linear equations…

Geometry: area and volume of figures (volume of prisms, cones, cylinders, etc.), applied to measurements of fields, to digging rivers and embanking dikes), etc.

In some books: Calculation of sum (Nguyen Huu Than, Pham Gia Ky); quadratic equations and cubic equations, the method of finding cubic roots (Nguyen Huu Than, Pham Gia Ky, Nguyen Can); Indeterminate equation (Luong The Vinh, Nguyen Huu Than,...); Chinese remainder theorem (Luong The Vinh, Nguyen Huu Than); magic squares (Nguyen Huu Than), using the Pythagorean theorem in practical problems (Nguyen Huu Than, Nguyen Can), Heron's formula for calculating the area of triangle (Nguyen Huu Than), congruent triangles (Luong The Vinh, Nguyen Huu Than, Nguyen Can).

Characteristics of the Han-Nom Math Books:

Chinese and Han-Nom ancient Math books had the same characteristics: mathematical problems were taken from real life; problems and solutions were formulated in words (without using formulas, which made them difficult to read and understand). Although Han-Nom Math books were written mainly under strong influence from Chinese books and the Vietnamese studied mathematics by Chinese old Math books, Han-Nom Math books had their own characteristics: many mathematics problems and rules are formulated in the form of the poem, in Nom (ancient Vietnamese language), therefore it is easier to understand, easier to remember, easier to use for Vietnamese people; In some books there were generalizations of mathematics results.

Unlike China, in Vietnam there were no classes, no teachers for teaching mathematics. Vietnamese either self-study mathematics, or teachers taught mathematics along with literature, or in the family, the father (grandfather) taught mathematics to his children (grandchildren).

See references (Hikosaburo Komatsu, 2013; Pham Vu Loc et al, 2021; A. Volkov, 2009, 2026) for more information on Han-Nom Math books.

Mathematics and mathematical education in Vietnam until the beginning of the XIX century

Based on Latin letters, Western missionaries developed the Romanized Vietnamese script, in accordance with Vietnamese pronunciation, so Vietnamese letters were gradually accepted by the Vietnamese as the official language. Since 1864, French colonists have opened schools for the training of translators and mandarins, and mathematics has begun to be taught in Vietnamese. The first two mathematical books appeared in Vietnamese in this time. However, during this time and until 1945, the Vietnamese studied mathematics mainly from French books. Influenced by French math books, some Han-Nom math books introduced new techniques, rules, and problem and solution formulations.

Mathematics and Mathematics Education in Vietnam from 1900 to 1945

To eliminate the influence of Chinese culture, the French colonists carried out an education reform between 1906 and 1919. As a result, examinations in the Chinese system (in Chinese and using Chinese books) ended in 1919. Vietnamese has become dominant in literature, in life, and in science. The French-Vietnamese school system, including mathematics in the curriculum, was established throughout Vietnam. Vietnamese people studied mathematics mainly from French math books. However, at this time, several Vietnamese-language mathematics books were published.

Since 1906, the French have established several universities and colleges in Vietnam.

Since 1930, some talented young students were sent to study mathematics in France (Hoang Xuan Han: École polytechnique, 1930, University of Sorbonne, 1936; Ta Quang Buu: Louis le Grand School, Henri Poincaré Institute, Paris University, Bordeaux University, 1929-1934; Nguyen Xien: Toulouse University, 1927-1932; Nguyen Thuc Hao: Marseille University 1929-1933, Le Van Thiem: École Normale Supérieure, 1939-1943). After returning home, they became the first professors of mathematics at French institutes or at institutes created by the Democratic Republic of Vietnam in the 1950s.

Hoang Xuan Han became a great scholar of Vietnam. He studied not only mathematics but also astronomy, the calendar, history, and literature. Hoang Xuan Han, together with some of his colleagues, founded the *Vietnamese-language magazine Sciences*. He compiled a Vietnamese science dictionary. He wrote many popular mathematical articles. Hoang Xuan Han was the Minister of Education of the Tran Trong Kim government and the author of a new program in Vietnamese education (in 1945).

After the August Revolution (1945), Nguyen Thuc Hao was appointed General Secretary and Director of the Hanoi University of Science, the first university under Democratic Republic Vietnam. Later Nguyen Thuc Hao became a long-time rector of the Vinh Pedagogical Institute (1959-1974).

Ta Quang Buu and Nguyen Xien were members of the government of the Democratic Republic Vietnam.

2. Vietnamese mathematics and mathematics education from 1945 to the present

Vietnamese Mathematics and mathematical education from 1945 to 1954

From December 19, 1946, slightly more than a year after the declaration of independence, Vietnam began a war of resistance against the French colonialists. In December 1946, Nguyen Thuc Hao created a university-level math class in Nghe An province. The Math class was small in size but was huge important for a newborn state of Vietnam. The first students of this mathematics class later became the leading scientists of Vietnam. The mathematics class taught by Nguyen Thuc Hao marked the beginning of higher education in Vietnam after the colonial period.

The development of mathematics and mathematics education in Vietnam was greatly shaped by Le Van Thiem's return from France. In 1939, Le Van Thiem went to France to study at the École Normale Supérieure. In 1942, under the leadership of George Valiron, Le Van Thiem began his research on the distribution of values of meromorphic functions (Nevanlinna Theory). It was during this period that he made an important contribution to solving the inverse problem of the Nevanlinna theory, which formed the core of his doctoral dissertation (1945, Göttingen) and Doctor d'Etat (1949, Paris) and placed him among the best young researchers in this field (Ha Huy Khoai, 2013).

At that time, Le Van Thiem was an idol for young Vietnamese people. The return of Le Van Thiem attracted young Vietnamese talents to pursuit science and mathematics. In 1951, in the forest of Viet Bac, the temporary capital of the government of the Democratic Republic of Vietnam during the war of resistance against France, Le Van Thiem founded the *University of Science*. The first students of the University of Sciences later became Vietnam's leading scientists. It can be said that the University of Sciences played an important role not only in teaching students at the university level but also in establishing the first mathematical research group in Vietnam after the colonial period.

Students in the liberation zones studied under the 10-year school system using Vietnamese-language textbooks, among them a geometry book by Hoang Tuy. And in the French region, they studied by the French system.

Vietnamese Mathematics and Mathematics education from 1954 to 1975

The war of resistance against France ended in 1954. Since 1955, the Vietnamese Government has decided to teach mathematics in Vietnamese at all levels. In 1956, Hoang Tuy was appointed chairman of the Textbook Editorial Board; he was also the author of the first mathematics textbooks in the Democratic Republic of Vietnam.

Since the 1960s, the Ministry of Education has organized mathematical Olympiads every year, even during the war, for primary, secondary, and high school students (4th, 7th, and 10th grade). Specialized mathematical classes were first organized at the University of Hanoi, at the Hanoi Pedagogical Institute, at the Vinh Pedagogical Institute, then extended to nearly every Northern province. The Vietnam Mathematical Society created the journal Mathematics and Youth in 1964. Those activities stimulated young students' passion for mathematics. Many students in specialized classes at schools won medals at international mathematical Olympiads (IMO) and then received scholarships to study mathematics in different countries. Many of them have become famous mathematicians worldwide, such as Ngo Bao Chau, Vu Ha Van, to name a few.

At the same period, students in the South of Vietnam studied under the 12-year school system.

The university opened in Hanoi again in 1955. Le Van Thiem was the rector of the University of Science. Students who graduated from the University of Science had the opportunity to do research in mathematics. Many of them were sent abroad, mainly to the USSR, Eastern Europe, or China, for master's or PhD programs. Almost all of them received a Ph.D. after 2 or 3 years of study. In particular, in just one year, Hoang Tuy wrote a PhD thesis under the guidance of Professor D. E. Menshov and published 5 articles in leading Russian journals during his 20 months in Moscow. A few years later, Hoang Tuy became the “founding father” of global optimization, with the famous *Tuy’s cut* in non-convex optimization. Nguyen Canh Toan, while working at the University of Science, successfully defended his PhD thesis in Russia in 1963 with important results in projective geometry. After that, he became the deputy minister of education.

The Vietnamese Mathematical Society, founded in 1966, played an important role in the development and teaching of mathematics in Vietnam.

At this time, two Vietnamese research Mathematics journals in foreign languages (English, French, and Russian) were founded: *Acta Mathematica Vietnamica* and *Vietnamese Mathematical Journal*.

During this period, many mathematicians changed their interests from theoretical math to applied math, following the government's science policy (Le Van Thiem, Hoang Tuy, Phan Dinh Dieu,...).

Despite the war, the government still sent many young people abroad to study in various fields, including mathematics. Most of the current mathematicians aged 60-80 studied abroad, especially in the Soviet Union. At the same time, the government decided to prepare graduate students and doctoral students in Vietnam.

Government policies worked: scientific and technical forces, including mathematics, were developed in both quantity and quality.

Vietnamese Mathematics and Mathematics education from 1975 to the present

After the country's reunification in 1975, mathematics in Vietnam finally experienced favorable conditions for development: Mathematicians of the South and the North become members of the Vietnamese Mathematical Society; Collaboration in mathematics was were much easier. Many young people receive scholarships to study abroad, not only in socialist countries but also in other countries such as France, West Germany, Italy, and Japan. The Vietnamese Mathematical Society and the Vietnamese government always paid attention to scientific relations with foreign countries.

For more information about Vietnamese mathematics (Le Tuan Hoa, 2020; Ha Huy Khoai, 2013).

Vietnam has established a strong position in mathematics worldwide: Professor Ngo Bao Chau was awarded the Fields Medal; the Institute of Mathematics became one of the 10 best institutions of the Third World Academy; the Vietnamese Mathematical Society is growing rapidly both in quantity and quality.

3. Conclusion

The history of mathematics in Vietnam represents a continuous journey of development and endeavor, evolving from practical applications in land measurement and administrative calculation during the feudal period to a modern, theoretical mathematical foundation today.

First, a tradition of learning and a high regard for examinations have existed for centuries. Since the 11th century, mathematics examinations have been organized to select mandarins, and Han-Nom mathematical books have demonstrated efforts to "Vietnamize" mathematical knowledge for greater accessibility. Although there were no

formal schools specializing in mathematics during this era, the Vietnamese people self-cultivated their knowledge through books and family instruction.

Second, the cultural and educational intersection during the French colonial period (early 20th century) served as a pivotal turning point. The transition to a Western education system and the adoption of the Romanized Vietnamese script (*Quoc Ngu*) laid the foundation for the first generation of formally trained mathematicians in France, such as Hoang Xuan Han and Le Van Thiem. Their return and dedication were crucial drivers for building an independent higher education system and mathematical research community.

Finally, from 1945 to the present, despite the hardships of war, Vietnam has successfully built a comprehensive mathematics education system from primary to university levels. Policies promoting specialized mathematics classes, organizing student competitions, and establishing mathematics journals have nurtured numerous talents. This has resulted in the emergence of world-renowned mathematicians, such as Professor Ngo Bao Chau, and in the elevation of the Institute of Mathematics on the international stage. Looking back at history, it is evident that Vietnamese mathematics has made significant strides, affirming its position and promising continued strong development.

References

Le Tuan Hoa (2020) *The Development of Mathematical Research in Vietnam at a Glance*, Math Intelligencer, Volume 42, Number 4, pp. 50-58.

Ha Huy Khoai (2013), *On Contemporary Mathematics in Vietnam*, In: Eberhard Knobloch. Hikosaburo Komatsu, Dun Liu (Eds.), Seki, Founder of Modern Mathematics in Japan, A Commemoration on His Tercentenary, Springer Proceedings in Mathematics & Statistics, Vol. 39, Springer Japan, pp. 375-383.

Ta Ngoc Lien (1979) *Some Features of Vietnamese Mathematics in Pre-modern Times* (in Vietnamese), In: Van Tao (ed.) The Study of Science and Technology in Vietnamese History, Hanoi, Social Sciences Publishing House, pp. 289-314 (in Vietnamese)

Pham Vu Loc, Nguyen Huu Mui, Ta Duy Phuong (2021) *Research on math exams in Vietnam from the 11th to the 18th century*, Han Nom Review, No.5 (168), 2021, pp. 30-43 (in Vietnamese).

A. Volkov (2016), *Mathematics in Vietnam*, In: H. Selin (ed.), *Encyclopaedia of the History of Science, Technology, and Medicine in Non-Western Cultures*, 3th Edition, pp. 2818-2833.

A. Volkov (2009), *Mathematics and Mathematics Education in Traditional Vietnam*. In: Eleanor Robson and Jacqueline Stedall (eds.), *Oxford Handbook of History of Mathematics*, Oxford, Oxford University Press, pp. 153-176.