Foreign influences on Dutch mathematics teaching

Harm Jan Smid
Leiden University, The Netherlands

Abstract

During the nineteenth century, mathematics was gradually established as a major topic within the Dutch secondary school system. In this period, French and German influences are easily ascertained within the program and schoolbooks, and also with leading personalities of the time, like Jacob de Gelder (1765-1848) and Jan Versleys (1845-1920). But, once holding a strong position within the school system, Dutch school mathematics became more rigid, less open to influences from abroad. The prolific and influential schoolbook writer and didactician Pieter Wijdenes (1872-1972) openly declared he never read any schoolbook from abroad. Another key figure in the first half of the twentieth century, Eduard Jan Dijkstra (1892-1965), was as historian of mathematics much more internationally orientated, but as a math didactician he was not. Modern ideas were propagated by Tatiana Ehrenfest-Afanassjewa (1876-1964), born in Kiev and educated in St. Petersburg, who had studied math and physics in Göttingen with Klein and Hilbert. In 1912 she came to Leiden where she lived until her death. When finally in the sixties of the last century Dutch school mathematics underwent a thorough reform, a decisive role was played again by someone originally from another country: Hans Freudenthal, (1905-1990) from Germany. Freudenthal came in 1930 as an assistant to L.E.J. Brouwer to Amsterdam, and also remained in The Netherlands until his death. He attended for many years a didactical working group organized by Tatiana Ehrenfest-Afanassjewa, and there can be no doubt that this working group played an important role in arousing his interest in and developing his ideas about mathematics education. In the conclusions some explanations are formulated why in the first half of the twentieth century Dutch math teaching entered such a period of stagnation.

Introduction

Most studies in the history of mathematics education are dealing with that history within the context of a specific country or region. Influences from other countries are usually treated accidentally, not systematically. Nevertheless, it goes without saying that such influences do exist, and that the strength of these influences will have varied throughout time. A discussion of foreign influences on math teaching in a specific country can be illuminating. In this article, foreign influences on the development of Dutch math teaching are the main subject.

These influences can be exerted in different ways. For example, the creation of the French Ecole Polytechnique or the German Gymnasium and Realschule had its influences on the Dutch educational system, and more specifically on the math teaching in that system. In this article however, that type of “institutional influences” will be left out of account. We will concentrate on the influences of pedagogues, mathematicians and textbooks, and their authors, on Dutch math teaching and the leading personalities. As we will see, there were also periods in which foreign influences were minimal. We will also see that this can equally be illuminating and helpful to understand the character of such a period.
The focus in this article will be on secondary education, but we will also discuss foreign influences on primary education during the first half of the nineteenth century. The division between arithmetic and math was not as sharp in that period as it was later on, and in that time even a form of elementary geometry was introduced in primary schools due to foreign influences.

An idealistic period: Primary education in the first half of the nineteenth century

One of the remarkable aspects of the Dutch school system in the nineteenth century was the focus by the government on primary education. Basic education for the population as a whole, including the lower classes, was considered important. As a result, the government enacted surprisingly modern laws on primary education. One of the novelties was that arithmetic became a compulsory topic in primary schools.

That focus on primary education was due to the particular form of the religious inspired Enlightenment that dominated thinking about education in The Netherlands. That movement also influenced the teaching methods; practice and drill only as in the old textbooks on arithmetic was not longer acceptable, but an understanding of what you were doing became essential.

In this climate, the ideas of the Swiss pedagogue Johann Heinrich Pestalozzi fell into a fruitful soil. Primary education in The Netherlands was heavily influenced by Pestalozzi, one might even say, in the words of E. de Moor, that “the central ideas of Pestalozzi dominated the Dutch educational system in the first half of the nineteenth century” (De Moor, 1999, p. 14). That is to say: on primary schools. The most important propagator of Pestalozzi’s ideas was Pieter Johannes Prinsen, the head of the first State school for the training of teachers for primary schools. In 1809, Prinsen translated and published a book by Pestalozzi on the principles on learning arithmetic, treating the “three principles” of his method. Later, Prinsen translated the complete works of Pestalozzi into Dutch (Prinsen, 1826-1831).

Prinsen wrote well appreciated articles about Pestalozzi’s ideas of how to teach arithmetic and in his teacher training institute in Haarlem, the trainees were thoroughly trained in Pestalozzi’s ideas (Beckers, 2003, p. 92). Another result of Pestalozzi’s influence was the introduction of the Formenlehre, in Dutch “Vormleer”, a kind of elementary geometry. The Formenlehre, in the version developed by Joseph Schmid, a disciple and assistant of Pestalozzi in his institute in Yverdun, became a popular topic in Dutch primary schools, and in the new law on primary education of 1857, it became even compulsory (De Moor, 1999).

A nice example of the far reaching influence of Pestalozzi can be found in a small booklet Oefeningen met den kubus (“Exercises with the cube”) published in 1817, dealing with exploring and observing the cube, “according to Pestalozzi”, as the frontispiece says (Oefeningen, 1817). The remarkable thing is that it was written and published by a group of primary school teachers, who had formed a study
group, headed by one of the school inspectors. Such groups, aiming at promoting the
level of the primary schoolteachers, were quite common in those days. This
study group came from a small town, Sneek, and its surrounding villages, in the
north of the country. Even in such a rather remote place, far away from what
could be called the intellectual centre of the country, Pestalozzi exerted his
influence! Other names, for instance the name of F.A.W. Diesterweg, could be
attached to the further development of the teaching methods of arithmetic and
elementary geometry in Dutch primary schools. It can be said that concerning
primary education, foreign influences, especially German ones, can be easily traced
in the first half of the nineteenth century.

A hesitating start: Dutch math teaching in the first half of the
19th century

When the Dutch government in 1815 ordered that “the principles of
mathematics” should be taught in all grammar schools, these schools were
confronted with considerable problems. There was no experience with or tradition
in math teaching at this type of schools, so there were no Dutch textbooks
especially written for these schools. Existing textbooks were written for university
students, or for the pupils of vocational schools. So it’s no surprise that in the
beginning, translations of French and German textbooks were quite often in use.
For example, the textbooks of Lacroix, especially his geometry in several
translations and adaptations, became rather popular.

In 1826 the government issued an additional decree, formulating a more
detailed curriculum containing arithmetic, algebra and plane geometry, and
advising to use the books of Jacob de Gelder, a math professor from Leiden
University. Jacob de Gelder was born in 1765, in or around Rotterdam. He did not
attend a grammar school nor did he go to university, he was really a self made man.
He started a private school (which eventually went bankrupt), taught mathematics
to the sons of the ruling and wealthy classes, worked on a surveying project,
became a lecturer of mathematics on a military academy and became finally
professor at the University of Leiden. He firmly advocated the teaching of
mathematics for all types of schools – vocational, modern or grammar schools, he
always furnished the reasons why mathematics should play an important role in
that school. Although his ideas were by no means undisputed,
in the period 1820-
1840 he certainly was the leading textbook author and didactician of the country,
and, as we saw, even supported by the government.

The most complete outline of his ideas can be found in the methodus docendi, a
chapter in a book about teaching and education in general (De Gelder, 1826). He
was not an original thinker in this field, nor did he pretend to be so, but his ideas
were in line with those that were fashionable at that time, especially in Germany.
He tried to keep abreast of modern developments and international trends in math
teaching. He was interested in what was going on abroad, he for instance
exchanged letters with Diesterweg, who praised his textbooks.
One of the didactical topics that were en vogue in those years was the Socratic dialogue, or in German, die Sokratische Lehrmethode. The idea was that instruction should not just consist of a monologue by the teacher, but that the pupils should engage actively in the teaching process. This could be achieved by conducting a dialogue between teacher and pupils. The name, die Sokratische Lehrmethode, stems of course from the well known dialogue between Socrates and the slave Menon.

In The Netherlands, this method was mainly popular in the field of primary education, but De Gelder propagated this method also for secondary education. In his *methodus docendi* he gave lengthy examples of these dialogues, taking a theorem or problem from one of his textbooks, and then writing out a complete discussion between the teacher and some pupils on this topic. However, as can be seen from his examples, there is no discussion between pupils themselves; the teacher is playing the central role. How much these ideas were in fashion, especially in Germany, is nicely demonstrated by the paper the great Weierstrass wrote to get his teaching license. It's title was: Über die sokratische Lehrmethode und deren Anwendbarkeit beim Schulunterrichte (Weierstrass, 1845).

In those years, the first half of the nineteenth century, Dutch math and arithmetic teaching was open to foreign influences. Key figures in the field, like Prinsen for primary education and De Gelder for secondary education, were internationally orientated and tried to shape math education in their country in accordance with modern, international ideas.

**Coming of age: Dutch math teaching in the second half of the nineteenth century**

Some decades later, math had gained a strong position in the new “Hogere Burger School” (usually abridged as “HBS”), comparable with the German Realschule, and in the modernized gymnasium. Centralized final exams had set fixed standards for what should be taught and learned. Dutch math textbooks of good quality were available; the use of foreign textbooks had become very exceptional.

The most important textbook author and didactician of that period was Jan Versluys, who lived from 1845 until 1920. Just like De Gelder, Jan Versluys had no university background. As a young man he went to the State institute for the training of primary school teachers in Haarlem, the institute that had done so much to propagate the ideas of Pestalozzi. After receiving his teaching license for primary schools, he passed additional exams in mathematics which allowed him to teach math on the secondary level. He was not only a prolific writer of math textbooks, but also the author of the first Dutch handbook on didactics of mathematics (Versluys, J. 1874). He also wrote books and articles on the history of mathematics and the history of education and eventually became the chairman of the Dutch Association of Pedagogues.

In his ideas on teaching methods, Versluys was influenced by German didacticians and textbooks authors and their ideas on heuristic math teaching. In his book on teaching methods, he strongly advocated heuristic teaching and self
activity of the learner. In the same book, he mentioned a book on heuristic geometry teaching written by his brother, Willem Versluys (Versluys, W., 1872). In the foreword of that book, Willem Versluys referred to two German authors, Karl Snell and Oskar Schlömilch, who wrote geometry textbooks in a heuristic form (Snell, 1841; Schlömilch, 1849).

Although not impossible, it is rather unlikely that Willem Versluys was really the author of this geometry book. Willem Versluys was also trained as a schoolteacher, but was not active as such and became well known in Dutch literature as the publisher of schoolbooks and of the most important Dutch poets and novelists around the turn of the century. It seems more likely that Jan Versluys used his brother’s name, because he doubted the success of such a textbook and did not want to attach his name to a possible failure. If so, he was right, because Willem Versluys’s book was not a success, most likely it was too extreme for the market. The more traditional textbooks of Jan Versluys however, became very successful and dominated the Dutch schoolbook market for decades. Although Jan Versluys propagated the heuristic method in teaching, he saw no problem in combining “dogmatic” textbooks with heuristic teaching (Smid, 2008).

In mathematics itself, Versluys was heavily influenced by French mathematicians (Wansink, 1974). Around 1870, he was a strong propagator of what was then called “newer geometry”, in fact projective geometry. In 1868, the guidelines for the exams of HBS said that “some knowledge of the newer geometry is advisable”, and some months later Versluys published a concise textbook on this subject (Versluys, J., 1868). Later on it turned out that in writing this book he had made ample use of a French book of Rouché and De Comberousse, *Traité de Géométrie*, and that he, without permission of the publisher, even had copied some drawings from the book! (Rouché et De Comberousse, 1866) Versluys’ book on “newer geometry” did not become in use on the HBS because “newer geometry” soon disappeared from these schools, but remained in use for a long time for teacher training courses for math teachers. It’s likely that also French books in the vernacular were used in math teacher training. In an interview in 1983, Johan Wansink, then the grand old man of Dutch math teaching, told that in his younger years he was advised to learn French to be able to read French math textbooks. One of the books he remembered was the book of Rouché and Comberousse! (Goffree, 1985, p. 72).

In the introduction of his *Leerboek der vlakke meetkunde* (*Textbook of plane geometry*) Versluys mentioned some foreign authors, who in his opinion had published valuable books on the foundations of mathematics (Versluys, J., 1869). One of them was Jules Hoüel, who had published an *Essai critique sur les principes fondamentaux de la géométrie élémentaire* (Hoüel, 1867). In this book, Hoüel claimed that geometry could be founded on four axioms only. Versluys adopted Hoüel’s system and used it in his textbooks. Versluys was a very influential textbook author, and the axiom system was picked up by other textbook authors. Until the
fifties of the last century, one could find in Dutch plane geometry schoolbooks variations and adaptations of Hoüel’s axioms.

So, it can be said that also in the second half of the nineteenth century, Dutch mathematics education was open to influences from abroad. Its most prominent representative, Jan Versluys, was internationally orientated and did not hesitate to pick ideas, both on didactics and on mathematics, from foreign authors that he considered as useful for Dutch math teaching.

Stagnation and isolation: The first half of the twentieth century

That climate changed in the first half of the twentieth century. Dutch math teaching entered into a period of stagnation. It had acquired a dominant position in the educational system, there was a general feeling that it had gained a lot, and but also the feeling that there was much to lose. So it adopted a defensive attitude, saw threats for math teaching from every corner and clung rather convulsively to its position.

The two leading math teachers during the interbellum¹ were Piet Wijdenes and Eduard Jan Dijksterhuis. Wijdenes, who lived from 1872 until 1972, will not be known by many people from abroad, but that would not have bothered him. Wijdenes was not interested in what was going on abroad. When he was already in his nineties, he claimed that as a schoolbook author he never consulted nor possessed any foreign schoolbook. Wijdenes was a very prolific author, so this was at least a remarkable statement. He wrote more than ninety textbooks on arithmetic, algebra, plane and solid geometry, trigonometry, analytical and descriptive geometry. He was the founding editor of two journals, one of which eventually evolved into *Euclides*, the still existing official journal of the Dutch Math Teachers Association. He dominated for decades these journals that ousted older journals for math teachers from the market. Wijdenes books were of high quality, written in a chrystal-clear style, but they brought no renewal. He was, in the words of Johan Wansink, “an eminent conservator and consolidator, an overall restorer, not a reformer” (Wansink, 1978, p. 220). There are certain similarities between Versluys and Wijdenes: both were trained as teachers for primary schools, lacked a university background and were prolific schoolbook authors. But Wijdenes had not the broad range of interest that was characteristic of Versluys.

The lives of Jacob de Gelder and Jan Versluys showed already that having a university background is not a necessary condition for having an international orientation. The next case will show that a university background is, at least in mathematics education, also not a sufficient one.

Eduard Jan Dijksterhuis (1892-1965), will be known to many readers as a historian of mathematics. He became famous with his book *De mechanisering van het wereldbeeld (The mechanization of the world picture)*, that describes the development of physics and mechanics from the early Greek until Newton (Dijksterhuis, 1950). He

¹ The period between the two World Wars.
wrote this book in his spare time, since during most years of his career he was a
math teacher in the provincial town of Tilburg. In those days, if you organised
your life well, being a teacher left you quite some time to do scientific work.
Dijksterhuis was a very well organised man, and in his spare time he did not only
write his works on the history of science, he was also one of the editors of an
important cultural journal.

But that was not all. Dijksterhuis had very specific ideas about math teaching
and he propagated these ideas in many articles and speeches. He was a member –
and usually the most active member – of all important committees on math
teaching and teacher training during the interbellum. Although Dijksterhuis did not
write any schoolbook, there can be no doubt that he, together with Wijdenes, who
considered him as a friend and a congenial spirit, was one of the most influential
persons in math teaching of the period.

As a historian of mathematics, Dijksterhuis had his international contacts and
underwent their influences, and of course he was well acquainted with the
international state of the art. But concerning his didactical work, one cannot find any
international influences or contacts. In 1925, on a series of lectures at the
University in Groningen, Walther Lietzmann and Dijksterhuis were both speakers
on that occasion, but there are no indications that Dijksterhuis was interested in
what Lietzmann, who spoke about the laboratory method, had to tell (Van Berkel,

Dijksterhuis's basic didactical idea was as follows. Mathematics, but only in its
pure and rigorous form, is of great formative value for the education of young
people. Learning mathematics makes you a better thinker, even a morally better
person. To achieve this, mathematics should not be understood as a bunch of
tricks, but should be taught as a strict logically building, in an axiomatic way. He
called this epistemic teaching, meaning that the learner should be able at any
moment to render an account from what he was doing. It was in fact the ultimate
consequence of the ideas of educational reform during the Enlightenment, and in
this way Dijksterhuis’s ideas were in line with international ones - but with ideas
that originated a hundred years earlier.

This position led him to fight fiercely against all attempts to modernize
gometry teaching, or to rely more on intuitive reasoning, or to use common day
knowledge, or to use laboratory methods in teaching. In his view, that meant only
corruption of math teaching and made it worthless.

While for geometry the ideal content matter, Euclidean geometry, lay at hand, it
was clear to Dijksterhuis that the way algebra was taught did not have the
formative value he expected from math teaching. It had indeed become, in the
words of Felix Klein, ein Geistloses Formalismus. So something should be done there,
and Dijksterhuis became a propagator of the introduction of calculus in secondary
education.

In the beginning of the century, under Klein's influence, an attempt had been
made to introduce calculus into Dutch math teaching, but that attempt had failed.
Dijksterhuis tried again, but from another point of view. He did not propagate the teaching of calculus because of its applications in the first place. Calculus should be taught as a masterpiece of mathematical thinking and theory. Also in this case, the formative value should come first. Although he succeeded in including calculus into the curriculum of the state-owned schools, this proved to be a Pyrrhic victory. These schools were only a minority, and more important, calculus was not included into the exam program. The result was that in most schools calculus was ignored.

Although in his own time, there were some who considered Dijksterhuis as a dangerous innovator, since he laid less emphasis on learning all the traditional mathematical techniques and tricks and stressed the need to understand what one was doing, his point of view was in fact a conservative one. He pushed some aspects of nineteenth century math teaching, aspects that then had been progressive, to the extreme. The road he propagated was too difficult for the vast majority of the pupils – and perhaps teachers! – and was in fact a dead end street. The result was that Dutch math teaching around 1950 was in many ways the same as in 1900.

In the first half of the twentieth century, Dutch math teaching formed a small world of its own, with little interest in what was going on elsewhere. Of course, not everyone was satisfied with that situation. There were for instance attempts to modernize geometry teaching, but these attempts remained isolated and had little impact. But into this small world, in 1912 and 1930 two foreigners arrived.

**Entering two foreigners: The first half of the twentieth century**

The foreigner that arrived in 1912 was a Russian lady, Tatiana Ehrenfest-Afanassjewa, born in 1876 in Kiev, educated in St. Petersburg, who had studied physics and mathematics, had taught at a gymnasium and a university for girls, and then turned to Göttingen for further studies with Felix Klein and David Hilbert. There she met and married Paul Ehrenfest, a young and talented physicist, who in 1912 was appointed as the successor of the great Lorentz. The young couple moved to Leiden where they both lived until their death, Paul in 1933, Tatiana in 1964. She was greatly interested in math teaching, but her didactical ideas differed vastly from those then current in The Netherlands. Although she, like almost everybody then, believed in the formative value of mathematics, she was also a strong advocate of an intuitive and discovery type of learning for younger children, before confronting them with more rigorous math.

Soon after her arrival in The Netherlands she started organising discussion groups about the teaching of mathematics. These discussion groups became the focus for everybody interested in the renewal of Dutch math teaching. They were attended by a wide variety of people; such as university professors in math and physics, psychologists and pedagogues, and of course also math teachers. These groups remained active until the fifties of the last century, for a period of more than forty years.
Tatiana Ehrenfest-Afanassjewa also began soon to publish didactical brochures in Dutch, the first already in 1915. In a brochure of 1924, in translation, *What could and what should geometry teaching give to a non-mathematician*, she exposed her ideas on an intuitive, non formalistic geometry teaching for younger children (Ehrenfest-Afanassjewa, 1924). This brochure raised the anger of Dijkstra, who wrote a pamphlet against it (Dijkstra, 1924). Eventually, their exchange of views became the starting point for the Dutch journal for math teachers, *Euclides*. In 1931, Tatiana published her *Übungensammlung*, a collection of highly original geometrical problems (Ehrenfest-Afanassjewa, 1931). In some ways, they are congenial to the intuitive geometry problems that fifty years later were developed within the framework of the *realistic math education*. Two examples are shown below:

In which direction should an airplane have its take off to fly in the shortest way from Berlin to Moscow? The same for Berlin-Java. To determine on a globe with a taut rope. Is the arc of a parallel the shortest way between its endpoints?

Why does the moon, when we are walking, walks along with us? Why do objects that are close by, pass us faster than objects that are farther away, for instance when we are in a train? Make a schematic drawing! (Ehrenfest-Afanassjewa 1931, English translation by Smid)

There are indications that Tatiana Ehrenfest-Afanassjewa derived some of her ideas from a Russian math educator, S. I. Sjochor’-Trotskij, but if so, she gave an original twist to his ideas (De Moor, 1999, pp. 271-274).

Tatiana Ehrenfest-Afanassjewa had no direct influence on Dutch curricula and schoolbooks, and for a long time she and her group remained outsiders. Nevertheless, it can be said that her indirect influence was very important. Through her publications and her discussion groups, she created a climate for change that in the long run would bear fruit.

The other foreigner, who came in 1930 to The Netherlands, needs no introduction at all. It was Hans Freudenthal from Berlin, who became in that year the assistant of Brouwer, the famous topologist and intuitionist. Freudenthal was then 26 years old and first and for all a gifted mathematician. But he had already developed some interest in teaching, and in Amsterdam he met some interesting colleagues, like Gerrit Mannoury and David van Dantzig, who shared his interests and had some unorthodox ideas. They rejected for instance the idea of the “formative value” of math, because, like Mannoury said: “from learning math you only learn math and nothing more”. Freudenthal later said that he rejected the formative value concept as long as he could remember, but it seems not unlikely that his discussions with Mannoury and Van Dantzig did influence him.

Shortly after the war, Freudenthal was invited to speak to the discussion group of Tatiana Ehrenfest-Afanassjewa. He was invited as a mathematician, to speak about some problems concerning the connection between secondary and university education in math. He was not invited for his didactical ideas, because he had not published anything on the topic yet. But during the war, when Freudenthal had been in hiding for some years and could not do much
mathematics, his interest in teaching had deepened and he had formulated his own first ideas on the subject. After his lecture, Freudenthal immediately became a regular participant of the group, and in 1950 he became its chairman. There can be no doubt that the monthly meetings of this group helped him to form, shape and develop his, at that time still vague, ideas on math teaching (de la Bastide-van Gemert, 2006, pp. 126-138).

Although Freudenthal was in the beginning not as negative towards the ideals of the New Math as later has been asserted, he soon realised that this movement was not in line with his own ideas on math teaching. Although the New Math was an important factor in overcoming the old Dutch math teaching, it had only a limited and transient impact on Dutch math teaching, and ironically Freudenthal played an important role in resisting this example of foreign influence. But of course, that was not because he was satisfied with Dutch math teaching as is had been. He had different ideas about math teaching, and in the long run these ideas did not only change Dutch math teaching, but had their impact on a much larger scale. In the course of the second half of the twentieth century, Dutch math teaching became fully internationally orientated, not only open to influences from abroad, but also influencing the international scene itself.

Conclusions

The first half of the twentieth century can be considered as a dull and uninteresting period in Dutch math teaching. There were hardly any exciting developments or experiments, and those who wanted change, had little influence. Nevertheless, the question itself why Dutch math teaching entered such a period of stagnation is highly interesting. Of course, one could argue that this is quite accidental. The leading personalities of the period, Wijdenes and Dijksterhuis, were for some reasons inclined to conservatism and there were simply no proponents of renewal of their stature. There may be some truth in this point of view, but it is certainly not the whole truth. There were circumstances in the nineteenth century that were favourable for an international orientation and modernisation of math teaching, circumstances that were absent in the next period.

The first is the influence of the Enlightenment, with all its connected theories and ideas about education, which had an enormous international impact. The second half of the eighteenth and the beginning of the nineteenth century saw a lively discourse in The Netherlands on education and school systems. It resulted in a, for those years, modern system of primary schools, and the formation of teacher training institutes that were heavily influenced by ideas of educators as Pestalozzi. An important factor was that the State, at least in the case of primary education, supported these modernisations and by a system of school inspectors promoted modern ideas. There was a strong feeling of urgency to modernize the educational system, at least outside the universities.

So, in a way it was an advantage that Jacob de Gelder and Jan Versluys did not have a university background. De Gelder was a self made man, having its
formative years in becoming a schoolteacher when the discussions on education in The Netherlands were at their peak. Versluys had his training as a primary school teacher at the institute in Haarlem, in the time when the ideas of Pestalozzi still had their impact there.

There is also another point to consider. De Gelder was active in the period when mathematics was introduced in the grammar schools; Versluys was active in the early years of the new Dutch Realschule, the HBS. Both developments were inspired by examples from abroad, especially Germany. This type of math teaching was a novelty, and when it had to find its way on these schools, it was only natural to look at the foreign examples that had inspired them.

In the years when Wijdenes and Dijksterhuis were active, there was a totally different situation. There was of course the reform movement inspired by Felix Klein, but this movement was, certainly in The Netherlands, not supported by the majority of the professional mathematicians or math teachers. Math teaching in Dutch secondary education was firmly established now and could be considered as successful. One could argue that there was no need for a radical change, and if improvements were necessary, this could be achieved within the existing system and teaching practice.

On the national level, Dutch politics on education was dominated by what was called the school battle, a battle during several decennia about the financial support by the State for schools based on religious foundations. This battle ended in the first half of the twentieth century with a victory for the religious schools, but the result was that the government merely abandoned all attempts to exert pedagogical or didactical influences on schools and functioned only as a distribution mechanism for money. “State-pedagogy” was strictly forbidden. Promoting educational or curricular reform by State initiative was out of the question.

In the first half of the nineteenth century, an attempt to establish teacher training at the universities had failed, and for more than a hundred years, Dutch math teachers with a university background like Dijksterhuis, did not have any professional training which could have made them susceptible for new ideas at all. There were still secondary school teachers with a background as primary school teachers like Wijdenes, but in schools and in the teacher unions they were dominated by those with a university background. Moreover, the absence of teacher training colleges at the universities prevented the emergence of centres from which international influences and ideas for change could be promoted. So, it is understandable that the scarce attempts that were made after all to bring about some changes, as for instance the introduction of calculus or a modernisation of geometry teaching, failed.

That changed in the second half of the twentieth century. On the international level, the New Math movement could not be ignored. It was supported by the majority of the professional mathematicians and also by the younger math teachers, who saw it as a chance to modernize at last the long outdated math teaching in accordance with their own university training.
In the fifties, finally some form of teacher training at the universities was established. In the long run, this resulted not only in the formation of a teacher population with at least some knowledge of modern and international developments, it also helped to form a group of professional didacticians, who could act as a pressure group for change.

And at last, now also the State wanted change. At the end of the sixties, the secondary school structure, still based on nineteenth century law, underwent a radical change which opened opportunities for new curricula. As a result, the Dutch government took initiatives to modernize the math curriculum and was willing to pay for it. That eventually ended up in the founding of the Institute for the Development of Mathematics Education, the IOWO, the forerunner of the Freudenthal Institute.

Like in the nineteenth century, an international reform movement, support from influential groups, State initiatives and new school systems paved the way for renewal and, as a consequence, an international orientation of Dutch mathematics education. It may be accidental that the two people that played a major role in this renewal, Tatiana Ehrenfest-Afanassjewa and Hans Freudenthal, were foreigners. But the fact that they were relative outsiders, that they did have experience with foreign school and educational systems and did not have to defend established interests, was certainly an advantage.

References
Goffree, F. (1985). Ik was wiskundeleraar. Enschede: SLO.
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