THEMATIC SECTION:
MATHEMATICS EDUCATION

Mathematical Knowledge at Escola Normal Evangélica (Evangelical Normal School) in São Leopoldo

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ABSTRACT – Mathematical Knowledge at Escola Normal Evangélica (Evangelical Normal School) in São Leopoldo. The methods of document analysis and oral history were used to identify the place of mathematical knowledge in the Escola Normal Evangélica from 1950 to 1962. The sources used in the research were reports, photographs, official correspondence, newspaper articles of the time, circulars, bulletins, school notebooks and interviews. We concluded that the mathematical knowledge taught in the normal course, in the analyzed period, was compatible with that of regional normal schools, involving the contents of arithmetic, algebra and geometry. Pedagogical transfers took place between Brazil and Germany and, in addition, there were appropriations of knowledge for teaching, as a result of the approximation with other normal schools in the Brazilian state of Rio Grande do Sul.
Keywords: **Teacher Education. Mathematics. Cultural Transference.**

RESUMO – Saberes Matemáticos na Escola Normal Evangélica em São Leopoldo. Os métodos de análise documental e história oral foram mobilizados para identificar o lugar dos saberes matemáticos na Escola Normal Evangélica no período de 1950 a 1962. As fontes utilizadas na pesquisa foram relatórios, fotografias, correspondências oficiais, artigos de jornais da época, circulares, boletins, cadernos escolares e entrevistas. Concluímos que os saberes matemáticos ensinados no curso normal, no período analisado, eram compatíveis com aquele de escolas normais regionais, envolvendo os conteúdos de aritmética, álgebra e geometria. Aconteceram transferências pedagógicas entre Brasil e Alemanha e, além disso, aconteceram apropriações de saberes para ensinar, resultado da aproximação com outras escolas normais do Estado.
Palavras-chave: **Formação de Professores. Matemática. Transferências Culturais.**

The Soil and Seeds of German Schools in Rio Grande do Sul

The installation of denominational schools in Rio Grande do Sul started in the 19th century and was due to the presence of German Jesuits in the state, as well as the action of Evangelical-Lutheran leaders in the view of Arendt and Gomes (2008). According to Tambara (2008), the creation of these institutions would also be associated with the rise in demand for teacher education. The state government itself encouraged private education which, in the 20th century, would expand, even reaching the interior of the state (Arriada, 2008). Thus, in addition to the normal schools created by the government, denominational schools began to gain space.

The absence of elementary schools, in the places where German immigrants lived, has been pointed out as a cause for the creation of German schools in these places. In this regard, Hoppen (1991, p. 8) states: "All immigrants felt the lack of school, completely absent in the environment where they were located". However, even if the number of these educational institutions was not enough to meet the demand of the immigration wave, there were public schools in considerable number in the state of Rio Grande do Sul: in 1910 there were 1.231 public schools, of which 180 were vacant; in 1912 there were 300 urban schools and 897 rural schools; in 1916, the number of isolated schools was 660 and two years later it was 1.090 (Messages from the Governor of Rio Grande do Sul to the Assembly (RS): 1891 to 1930)[1]. The crucial issue is that the existing schools were not the kind of school that German immigrants of evangelical or Catholic denomination wanted for their children. Public schools did not meet the wishes of such communities, who wanted an *authentic* German school, similar to those in Germany, but in Brazilian lands. They aspired to an institution in which teaching was taught in the German language, in which religion was the one they worshipped, in which Germanic culture was transmitted and which ensured the perpetuation of such a culture. In this sense, in fact, there were no schools that met these objectives. Naturally, to work in schools with these characteristics, teachers prepared for this purpose were needed. Thus, in order to meet this demand, a school to train primary school teachers was created in 1909 in Rio Grande do Sul (Silva, 2018).

For 30 years, from 1909 to 1939, the German Evangelical Teacher Training Seminar for Rio Grande do Sul existed in Rio Grande do Sul (*Deutsche Evangelische Lehrerseminar für* Rio Grande do Sul). However, with its closure in 1939, as a result of the nationalization campaign and World War II, a gap was opened in the offer of professionals to exercise primary education in German evangelical schools. Approximately ten years passed before an emergency course was proposed. Since the *Pre-Theological Institute* (Instituto Pré-teologico (Proseminar), an institution designed to train pastors, was not closed during the war or affected by the Nationalization Campaign, but continued to function, it became the ideal place to offer a course in teacher training. In 1948, the teach-

ing department of the Riograndense *Synod* (Sínodo Riograndense) proposed that an emergency pedagogical training course, lasting one year, be created and function as an annex to the first series of the Pre-theological course. This was the first step towards the reopening of a normal school, which would not be the same as the one that existed until 1939, but which should at least make up for the shortage of teachers for the initial years in German-Brazilian schools.

In 1950, this course was structured as a Regional Normal Course, lasting 4 years, operated at the Technical School of Commerce (Escola Técnica de Comércio) and its first director was Professor Hans Günther Naumann[2]. The structuring of this course followed Decree-Law 8,530, of January 2, 1946, called the Organic Law of Normal Education. It started with 15 students, 10 of them from the Fast Course and five new ones. The following year, this number grew to 31 students. From then on, the fast course was no longer offered. The newcomers' lack of preparation required the creation of a Preparatory Course for the Admission Exam, which began to work with 8 students. In 1957 there were already 97 students enrolled in the school (Director's report).

In a survival strategy, the school tried to follow the current legislation, approaching other similar Brazilian schools. It also changed its name, abandoning the German name *Deutsche Evangelische Lehrseminar für* Rio Grande do Sul (DELS) and renamed Escola Normal Evangélica. This strategy was used by other educational institutions in the state, as mentioned by Jacques (2015): in 1936, for example, *Hindenburgschule* abandoned this old German name, renamed Ginásio Teuto-Brasileiro Farroupilha (Farroupilha Teuto-Brazilian High-school) until 1942, when it became Ginásio Farroupilha (Farroupilha High-school) and, more recently, in Colégio Farroupilha (Farroupilha School).

According to Hoppen (1991, p. 67), the new course, in São Leopoldo, "[...] was born from the ashes of the nationalization period, it was adapted to the new situation and its circumstances".

Closer to the format of the 1st grade Normal Schools, the new course adapted to Brazilian legislation continued to aspire to broad training for candidates. According to the director, the future teacher should have a solid base of general culture and, in the first place, knowledge of the Vernacular Language, in addition to Mathematics, History, General and Brazilian Geography and Natural Sciences. The German language, as the mother tongue of most students, could be officially taught, as provided for in the Organic Law for Normal Education. Such a course should be independent of any other secondary course. In addition, and indispensable for the exercise of the profession, there were the pedagogical subjects. The normal school operated in São Leopoldo, in the buildings of the former Seminary and, in 1966, it was transferred to Ivoti, where it works until today. Until 1962, it offered a normal 1st degree course and, from then onwards, began to offer a broader, secondary level education, which enabled its graduates to apply for higher education (Report of the President, General Assembly of the Evangelical Association of Teaching, 1962).

In addition to documents belonging to the collection of the Ivoti Education Institute (Instituto de Educação Ivoti) and private collections of deponents, we used oral history in this investigation. It is a methodology that enriches knowledge about school life, especially when documentary sources are scarce or insufficient to answer the investigative question. Furthermore, the deponents told us about school practices that the documents would hardly be able to reveal. For Benito (2017, p. 156), "Living tradition can express, in its manifestations, the persistence of certain cultural standards embodied in the behavior of actors, in the form of uses and habits". In the following item, we will bring some testimonies from former seminarians of Escola Normal Evangélica, accompanied by reflections on the speeches of those who participated as students or teachers in the life of this institution. Whenever possible, we will cross-reference interpretations from different sources.

Teacher Training and Mathematical Knowledge

> In my primary school, I was influenced by an organizational model that helped me a lot to work in single-teacher schools for a few years. Despite having been a pedagogically very 'Prussian' school, it laid the foundations for my cultural formation *(*Wagner, 2019*)*.

The epigraph is a fragment of the testimony of Hermedo Wagner, a student in the first class of the teacher training course after its reopening in 1950. He was born in Sinumbu (RS) in 1936.

Among the actors in school life are the teachers of a lifetime, who remain in the imagination of each one, as they were, after their parents, the main authorities in the world of children (Benito, 2017). Wagner begins his account by talking about the teacher of his primary school, where he studied for six years (1944-1949) – teacher Adolfo Dassow, who obtained his training at the Lehrerseminar in 1923. Wagner, when speaking, pours out his emotions and shows why he admired his primary school teacher:

> Prof. Dassow was a serious, cultured man, opened my horizons to the world, valued research and encouraged initiative in study. He sang a lot with us and always accompanied by his violin. He did not give great explanations, but showed paths and indicated sources for reading and guidance (Wagner, 2019).

Dassov's outstanding classes, for five years, left marks in the deponent's education, who claimed to have borrowed from his teacher the model to act as a teacher in the early years, as soon as he completed his studies at the Escola Normal Regional Evangélica (Regional Normal Evangelical School). He probably finished primary school in 1949, since in 1950 he was already applying as a student in the teaching regents course at Escola Normal Evangélica in São Leopoldo. Admission to this institution was made through an admission test. Brito (2018, p. 95), in an interview conducted with graduates of Escola Normal Evangélica, found that there was "[...] a test of general knowledge, of Portuguese and of mathematics" as a condition for access.

Wagner, in testimony, stated that:

> In the regular free high-school course, from 1950 to 1953, I don't remember that we ever used any didactic material. The contents program, without the use of a book, consisted of a review of the 4 basic operations, fractions, geometry (area and volume), introduction to algebra, mathematical problem solving and a lot of oral calculus (Wagner, 2019).

One of Wagner's testimonies allows us to infer that the mathematics taught in the 1950s at Escola Normal Evangélica was closer to the contents of the junior high school course than to those of secondary education. Commenting on his preparation for entering the Pedagogy course in São Leopoldo, Wagner tells us that the mathematics seen in the normal course was not the same as in the scientific course: "I never heard of sine and cosine in the normal school".

The math notebooks used in the four years of study at Escola Normal Evangélica were preserved by our deponent. From them, we were able to prove what was narrated by Wagner. An analysis of them will be presented in this text.

In 1953, the mathematics taught in the first year of the teacher training course, according to the school director, was equivalent to that in Stavale's book. Interestingly, in Table 1, we are faced with a text written in a mixture of languages: Portuguese and German.

Table 1 – Extract from a Letter from Hans Naumann, Director of Escola Normal Evangélica

3. Mathematics: Etwa 1. High School. Nach Stavale. Elements of Mathematics. Grundrechungensarten, Wiederholung und Festigung. Bruecke.
Translation: 3. Mathematics: something equivalent to 1st grade of High School year, according to Stávale, elements of Mathematics, basic mathematical operations, repetition and consolidation, fractions.

Source: Ivoti Institute Archive Document: Letter from Hans Naumann, director of Escola Normal Evangélica to Prof. Florencio Berger on 07/06/1953.

A significant change in the pedagogical orientation of the new Escola Normal Evangélica concerns textbooks: German textbook authors (such as Otto Büchler) were no longer adopted, and the mathematics teacher followed the guidance of Stávale.

Everyone who has passed through the school remembers their teachers, some impressing more than others, but that stern teacher is hardly forgotten. Thus, Wagner goes on, recalling his training as a teacher and mentioning who were his two most outstanding teachers: the math and singing teacher, respectively, Helmut Kopittke and Wilhelm Weihmann. Kopittke graduated from the *Lehrerseminar* in the class of 1929 and later studied psychology at the University of Yena in Germany. Both teachers were references for Wagner, who learned to like math, his favorite subject. It was with Kopittkte that he first heard the name Piaget. The lack of maturity, when he was 16 years old, was, according to him, an impediment for him to more deeply understand

this psychologist. This would only happen when he studied Pedagogy at the Faculty of Philosophy, Sciences and Letters (Faculdade de Filosofia, Ciências e Letras).

Recalling his education at Escola Normal Evangélica, Hermedo Wagner stated that Koppikte and Weihmann "[...] never indicated a book as the basis for our study. There was a lot of library research and exercises" (Wagner, 2019). This new orientation of not using textbooks differs radically from that followed at DELS (*Deutsche Evangelische Lehrseminar für* Rio Grande do Sul), where textbooks were widely used (Silva, 2018). Therefore, we will show later, in this text, that the deponent made a mistake.

According to the deponent Wagner, Adolfo Dassow is second from left to right in the fourth row, wearing a light suit and horizontal striped tie (Figure 1). According to Hoppen (1991), Helmut Kopittke is fourth in the fourth row.

The curriculum of the teaching regents course had a duration of 4 years. The Escola Normal Evangélica sought to adapt to the provisions of law, as can be seen in Table 2. However, it did not lack its particularities, such as the subjects of foreign languages, religion, shorthand and commercial bookkeeping, as well as the learning of musical instruments.

Figure 1 – Photograph of graduates at the German Seminary in 1929

Source: Ivoti Institute Archive.

Table 2 – Subjects offered in the Escola Normal Evangélica (Evangelical Normal School) and Subjects Indicated for Teaching in Normal Schools

Curriculum Course Grid of Escola Normal Evangélica	Organic Law of Education Ordinance no. 8,530 of January 2, 1946
Portuguese, Mathematics, History, Geography, Natural Sciences, Didactics and Teaching Practice, Psychology, Drawing, Handicrafts, Gymnastics, Music, Religion, German, Pedagogy, Harmonium, Violin, Calligraphy, English, French, Stenography and Business Bookeeping.	Portuguese, Mathematics, General Geography, Natural Sciences, Drawing and Calligraphy, Orpheonic Singing, Handicrafts and Home Economics, Physical Education, General History, Notions of human anatomy and physiology, History of Brazil, Notion of Hygiene, Psychology and Pedagogy, Didatics and Teaching Practice

Source: Course completion certificate by Hermedo Wagner (left) and Brito (2018, p. 174).

The documents portraying the students' school life show that the subjects for pedagogical training took place in the last two years (Table 3). As for Teaching Practice, this was carried out at the primary school Instituto Rio Branco (Rio Branco Institute) primary school. A greater detail of the distribution of subjects over the four years of teaching is shown in Table 3.

Table 3 – Curriculum Grid by Grade

Serie	Subject
1st	Religion, German, Portuguese, Mathematics, General History, General Geography, Natural Sciences, Drawing, Gymnastics, Music, Harmonium, Violin.
2nd	Religion, German, English, Portuguese, Mathematics, General History, General Geography, Natural Sciences, Drawing, Gymnastics, Music, Harmonium, Violin, Handicrafts, Calligraphy.
3rd	Religion, German, English, Portuguese, Mathematics, Brazilian History, Brazilian Geography, Natural Sciences, Pedagogy, Educational Psychology, Didactics and Primary Education Practice, Gymnastics, Music, Harmonium, Violin, Handicrafts, Calligraphy, Typing.
4th	Religion, German, English, Portuguese, Mathematics, Natural Sciences, Pedagogy, Educational Psychology, Didactics and Primary Education Practice, Gymnastics, Music, Harmonium, Violin, Shorthand, Bookkeeping.

Source: Anibaldo Fiegenbaum's Bulletin 1952-1955 (IEI Archive).

The school selects the knowledge and subjects that make up the curriculum and also defines the values it wants to convey. In this case, the appreciation of music is a legacy of the Germanic tradition. Wagner remembers his primary school teacher Dassov playing the violin and singing during lessons (Silva, 2019a).

Seen from a historical perspective, Benito (2017) considers that the school's relations with culture are complex. We agree with the author regarding this complexity. In the case of the old *Lehrerseminar*, with the Nationalization, there was an intention to erase the German cultural vestiges of the institution – prohibiting that teaching was given in the German language and that German textbooks were used. Upon

restructuring, the new Normal School adapted to these requirements, but the German language did not disappear, it was only weakened, appearing in the curriculum as a foreign language. German textbooks that were strong vectors for the propagation of German culture were excluded from teaching.

The image in Figure 2 shows the first graduating class of 1953. Unlike other schools, where students pose with gowns and hats, the photograph records uniformed students and teachers in their suits, used to teach classes. In the photograph, the witness Hermedo Wagner identified, sitting from left to right: Silvia Suffrian, Irmgard Leistner, Helmuth Koppikte (mathematics professor), Hans Günter (director), Edith Winkel, Brunilde Werkheuser. Standing, in the same order: an unidentified person, Werner Käser, Edemar Treter, Werno Schuck, Hermedo Wagner, Lilly Schewe.

The photography portrays the context of an era, it expresses cultural values. In the case of photograph 2, in the central position of the image are two important characters in the school hierarchy: the principal and a class teacher. The director was the most important figure in teacher training courses, according to the German model, as he was responsible for the pedagogical training of the course. Teachers are seated, while two students are standing in the back. Knowledge holders have power. Teachers occupy a very specific place at the front, in the center of the photograph. All students are in uniform, teachers wear light suits and don't smile, as a demonstration of seriousness, which perhaps the moment demanded. Unlike what happened in other public normal schools in Rio Grande do Sul, there was a male presence, since of the ten graduates, four were boys. In the early years of the German Evangelical Formation Seminary, the opposite was true: most students were boys. At that time, the normal school trained teachers to work in rural schools, and this position, following the German tradition, could be occupied by girls as well as boys.

Figure 2 – Photograph of Graduates of the Class of 1953

Source: Hermedo Wagner's personal collection.

Most of the teachers were Germans or former students of German origin who had studied at the German Evangelical Seminary for Teacher Training, except for teaching the subject of Portuguese, which was carried out by a Brazilian woman.

In 1957, Wagner began his work as a teacher in the course Admission to Normal School, which served to prepare students for the entrance exam. Meanwhile, he was attending Escola Normal 1º de Maio (Normal School May 1st) in Porto Alegre, with a view to obtaining a secondary education. In 1960, he enrolled in the Pedagogy course at the Faculty of Philosophy, Science and Letters Christ King[3] (Faculdade de Filosofia Ciências e Letras Cristo Rei), in São Leopoldo.

Figure 3 – The Classroom Notebooks: time passed

Source: Hermedo Wagner's personal collection.

What do seminarian Hermedo's notebooks (Figure 3) reveal about the mathematical knowledge taught at the institution in the 1950s? As the deponent does not remember having used a textbook in class, will the notebooks bring subsidies that show the opposite?

The notes in Hermedo's notebook, on October 16, 1951, show the use of a book, as the homework for that day indicated problem 12 on page 149, problems 2 and 3 on page 150, and on the 17th of the same year and month, exercises 5 and 6 on pages 151. As director Hans had provided us with a clue to the author of a textbook, citing the name of Stávale, we searched in this author's 2nd year high school book for the problems mentioned (Figure 4). Confirming the suspicion, there were the problems mentioned (Stávale, 1948).

Figure 4 – Comparison between Book and Notebook

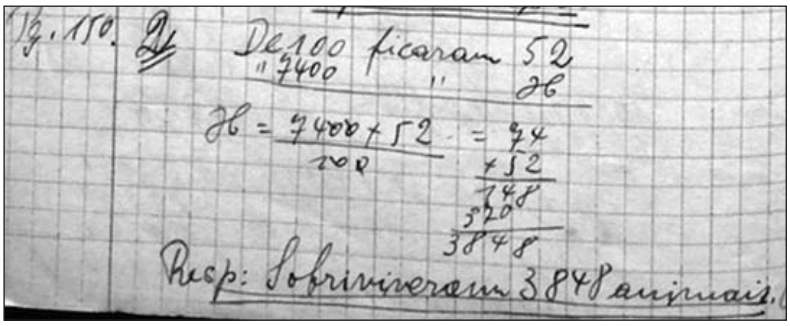


Figure Note: 2. One farmer had 7400 head of cattle. One disease has decimated 48% of their herds. How many animals survived?
Sources: Extract from p. 150 from the book Elements of Mathematics by Jacomo Stávale, second grade of the junior high school, 1948 and Extract from the Hermedo Wagner Notebook in October 1951.

The knowledge present in the notebooks involves contents of Arithmetic, Algebra and Geometry and are listed in Table 4.

Table 4 – Notebooks Mathematical Content

1st year 1950 Arithmetic, introduction to algebra; geometry) 162 pages	Arithmetic Review: four with whole and fractional numbers. Problems applied to buying and selling, number of students, distances covered, all involving the 4 operations of whole and fractional numbers. The letter x as an unknown value. Perimeter and quadrilateral area calculation problems. Numerical expressions. Letters x and y as two unknown variables be calculated in operations and problems. Divisibility: Maximum common divisor of two numbers, Least common multiple of two or more numbers. Problems with taps that fill tanks.
2nd year 1951 Units of measure, geometry Two notebooks with 146 and 70 pages	1st notebook: Decimal metric system: unit transformations. Monetary system. Problems applied. Problems of quadrilateral areas and lateral area and volume of prisms (cube, parallelepiped). Circumference: radius, arc, length. Problems applied to the circumference. Problems about speeds. Square root. 2nd notebook: arithmetic mean; operations with fractions; use of x as unknown variable; monomials and operations with them; proportions and properties; various applied problems including terrain measurements, calculation of areas and volumes, speeds. Percentages. Rule of three.
3rd year 1952 Algebra and Geometry Two notebooks with 61 and 34 pages	1st notebook: Relative numbers. The four operations with relative numbers. Numerical expressions. Algebra: polynomials, operations. Square root and cubic root. Cube and parallelepiped volume. Binomial. Negative exponents. 2nd notebook: equations of the 1st degree. Cubic Root. Cube volume calculation. Numerical value of algebraic expressions.

4th year 1953 Algebra and Geometry Notebook with 160 pages	Algebra: algebraic expressions. 2nd degree equation: relations between coefficients and roots. Solving high school equations. Equation systems: 3 equations and 3 variables. Recapitulation of Algebra: equations involving radicals, equation systems. Height of a triangle. Deductive geometry: theorems about perpendicularity, right angles, supplementary angles, angles opposed by the vertex, bisectors, bisector, postulate of parallels, parallelism, angles formed by two lines crossed by transversal, sum of the internal angles of a triangle, equality of triangles, parallelogram, rhombus, trapezoid, bisectors of a triangle, heights of a triangle, Thales's Theorem, Pythagoras' Theorem. Tithes, generatrix.

Source: Notebooks from the private collection of Hermedo Wagner.

There are strong indications that the class teacher, Professor Helmut Kopiktte, had used and adopted the books by Jacomo Stávale, thus breaking with the tradition of recommending books by German authors or those of German descent. We present below (Figure 5) some examples that show Kopiktte's use of that book (Stávale, 1954).

Figure 5 – Water Tap Problem

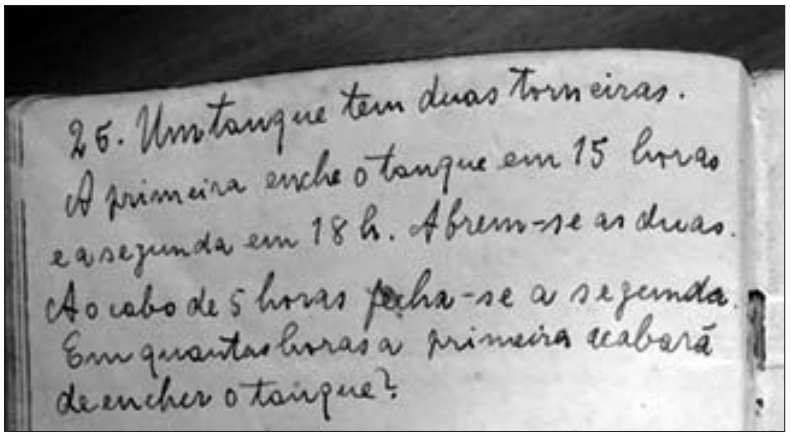


Figure Note: 25. A tank has two taps. The first fills the tank in 15 hours and the second in 18 hours. Both open. After 5 hours the second closes. How many hours will the first one finish filling the tank? R 5hr.50min.
Sources: Book of Jacomo Stávale, Problems in Mathematics, first grade, 1954, p. 59 and Notebook (Wagner, Hermedo 1950).

The second example shows an arithmetic problem where you are asked to find two numbers that satisfy a given condition. The student solves the problem algebraically (Figure 6).

Figure 6 – Problem solved algebraically

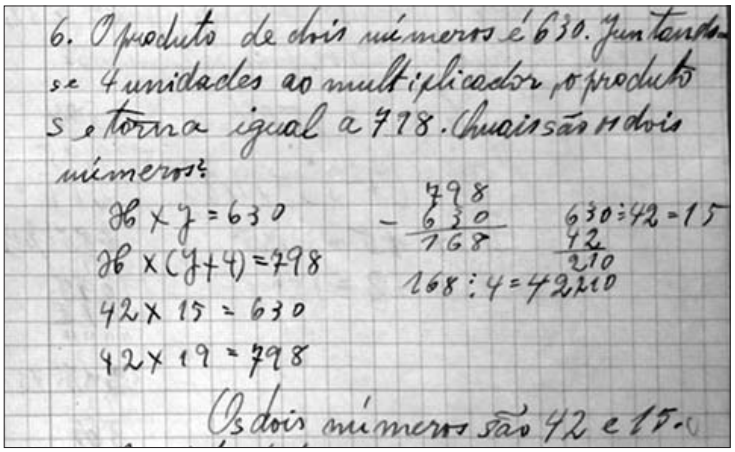


Figure Note: 6. The product of two numbers is 630. Adding 4 units to the multiplier makes the product equal to 798. What are the two numbers? R. 42 and 15.
Sources: Stávale, 1954, p. 20 and Hermedo's Notebook, 1950.

Cultural Transferences

As Cultural transferences, the object of investigations by several researchers such as Espagne (1999), Dittricht (2013), Fontaine (2014), Silva (2015), Matasci (2016), are used to understand the interactions between cultures and societies in a historical dimension. "The term cultural transference" marks the concern to speak simultaneously of various national spaces, of their common elements, without juxtaposition of considerations about one and the other to confront them, compare them or simply accumulate them (Espagne, 1999, p. 1). For Matasci (2016), teachers and textbooks are, among others, cultural agents which act as means of cultural transfers. The idea of the importance of the performance of individuals who, moving from one country to another, transfer knowledge is reinforced by Burke (2004), who believes that, for this to happen, physical movement of human beings is more valuable than transporting letters or books.

Even before completing the Pedagogy course, the normalist Hermedo Wagner became involved in teaching Didactics of Mathematics at Escola Normal Evangélica. Not feeling up to the task, he sought help, consulting books from the institution's library. In his testimony, he recalls using Thorndike's book[4]. A few years later, in the Pedagogy course and at the Higher Pedagogy Seminary in Worms, he received reinforcements as he studied Piaget's ideas more deeply. On this topic, he wrote a text that he used in his mathematics didactics classes, entitled Methodological norms for learning mathematics according to Piaget's theory (Wagner, 1980).

The Escola Normal Evangélica, with its Germanic heritage, maintained a pedagogical exchange with Germany. So Wagner received fi-

nancial aid to study for a year at the Westendshule College of Pedagogy in Worms. According to him: "There my eyes were opened to a different mathematics". Here in Brazil, he noticed that the teachers were worried that the students would memorize the multiplication table: "There I had contact with another practice, including in schools where I interned aiming to develop understanding, according to Piaget" (Wagner apud Silva, 2018).

In the case of the deponent Hermedo Wagner, we realized that, when he moved from his country of birth to a center with a tradition in pedagogical research, he received new knowledge and, based on motivations received in Germany, he appropriated new pedagogical knowledge and used it in Brazil.

After going through these experiences, he found that his former professor Weihmann's teaching was very Prussian – based on following rules. Thus, the mathematics and didactics of mathematics that he began to teach were based on the ideas of Piaget and also, according to him, of *our friend* Paulo Freire (Silva, 2019a).

Not only his experiences in Germany, but also his approach to educators in Brazilian events – such as the 1st Brazilian Congress on Normal Education in Rio de Janeiro, in 1966, and the course with Dienes, in which he participated at the General Flores da Cunha Educational Institute (Instituto de Educação General Flores da Cunha) in 1972 – caused changes in their way of understanding and teaching mathematics. In addition, he participated in other courses promoted by Professor Esther Pilar Grossi, at GEMPA, and had access to works that began to be published at the time, such as those by Brazilian educator Amaral Fontoura, mentioned by him.

The ideas contained in the text written by Wagner – Methodological norms for learning mathematics according to Piaget's theory show his understanding and appropriation of Piagetian thought: "Every proposed problem must lead the student who learns mathematics to a real action, therefore, concrete when it is a sensorimotor action, or an action represented when it is imagined, but both are real" (Wagner, 1980). He goes on to draw attention to the importance of action: "Mathematics is learned with movement, with action, with real operations [...] Preparing the student for learning is activating their action schemes".

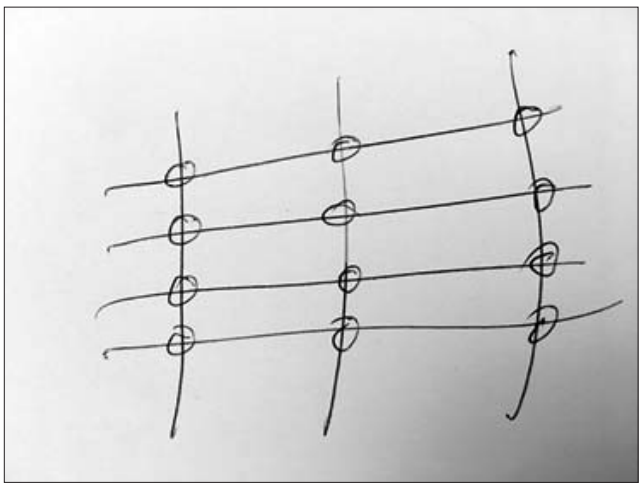
In the interview, the deponent drew our attention to the need for a practice in which students are involved in actions. In his text on Methodology, he wrote:

> We emphasize that in the methodology of mathematics, actions must be provoked, as it is not taught with static figures (stickers) on a flannelgraph, but with activities; static results are not used resulting from actions that the student did not practice, but the student who learns practices the actions. *We conclude that manipulative objects are more suitable than fixed posters*. While the student does not have the power to mentally manipulate, math-

> ematics teaching must be done with the manipulation of objects and, before the age of 12 (according to Piaget), the child usually does not have the mental maturity to 'manipulate mentally' (Wagner, 1980, italics of the author).

In that same interview, he provided examples of how he guided his mathematics didactics students to teach multiplication tables by tracing a drawing on paper. The drawing in Figure 7 was made by the interviewer during the interview. He started by explaining that he suggested the use of wooden sticks that should be arranged according to the drawing, if the multiplication of 3 times 4 was explained. He would take sticks placing them in a cross; after that, students should count how many times the sticks touched, that is, find and count all the points of intersection.

Figure 7 – Representative drawing of the 3x4 product



Source: Drawing by Hermedo Wagner on June 10, 2019.

Another example given for teaching multiplication tables was the formation of pairs to dance. From a certain number of girls and boys, find out how many different pairs could be formed. In his testimony, he highlighted: "These are things I learned in Germany. [...]. My math base was from the course in Germany. I brought a textbook from Germany. [...]. The mathematics I started teaching was based on Piaget's principles" (Wagner, 2019).

Invoking a fragment of his text Methodology of Mathematics, the deponent tried to explain how he appropriated the ideas of Piaget and Zoltan Dienes:

> [...] child learns mathematics by repeating, therefore, this 'walk' from the concrete (real) to the abstract. I would say 'in the child's life the evolution of humanity is repeated' just as humanity discovered the processes and the various formulas, in the same way the child must be guided

> to do it, starting from a story, a problem, a concrete and experiential social situation, to reach the axiom, that is, the rules, formulas, in short, systematization, which is an 'abstract expression' internalized in the learner's thought (Wagner, 1980).

The photograph in Figure 8 illustrates a classroom scene in which a young teacher in a suit appears in front of the blackboard. The space corresponds to a modern classroom, with individual tables, a large blackboard and some female students in a position of participants and others as listeners. Noteworthy in the photograph is the large abacus in front of the blackboard, a clock on a table and the blackboard with a chalk representation of a place-value painting. Probably the class was about teaching the decimal system and the teacher with his hand was indicating the position of the tens. In the image, the didactic material appears, such as the abacus and the clock. Also appears, to the left of the teacher, another large-sized object, which appears to be a blackboard (perhaps a flannelgraph). On the students' tables, there are many books and notebooks.

Figure 8 – Mathematics Didactics Class on August 17, 1966

Source: Hermedo Wagner's personal collection.

On the blackboard you can see the registered date. The drawing of the place value table is drawn in perspective. There are indications that the students are carrying out some practical activity, as they are standing with a paper in their hand. The students are not in uniform, and it looks like there are at least two young men seated. The hair color of the students, in this context, gives us evidence that they were of German descent.

Traditional photographs of the teacher and his students have been preserved as records of a time lived as a result of teaching, as seems to have been the case with the deponent Hermedo. Some photographs record fewer formal moments, such as the one in Figure 9, which shows a class of third-year students at the Escola Normal de Ivoti (Ivoti Normal

School), where boys are the majority, unlike what happened in other normal schools in the state, where o there was a feminization of the training courses for primary teachers.

Figure 9 – Hermedo with 3rd Year Normal Students at Escola Normal de Ivoti

Source: Hermedo Wagner collection, undated.

The deponents Erni Rohsig and his wife Isoldia Rohsig studied from 1959 to 1963 at the Escola Normal Evangélica. They reported the admission to the school and the entrance exam carried out: "In São Leopoldo there was an Admission Exam. It was a qualifying test that involved knowledge of the Primary School" (Silva, 2019b). Among the former math teachers remembered is Professor Yolanda, who, according to them, placed a lot of emphasis on teaching relative numbers. But the outstanding character, who remained in the imagination built by the deponents, was Ernest Sarlet, who, according to them, was

> [...] a great French psychologist, exiled from the War, gave us the logic of a child's learning process. He explored the need to observe mental development for any field of study. Not specifically, in the area of Mathematics. He emphasized that it is necessary to respect the information provided by children, from the environment in which they live with their beliefs and habits (Silva, 2019b).

In the evaluation of the Rohsig couple, the course had a lot of theory and little practice, and the mathematical content was not very suitable for application in the classroom. The theorems on the green board were recalled as part of this theoretical mathematical knowledge. However, despite the criticism, they recall having used the book entitled *Teaching Mathematics through Understanding*, a Portuguese-language translation by authors Foster Grossnickle and Levy Brueckner.

Finishing the Ties

After the end of World War II, seeking to keep in operation, a teacher training school of evangelical religious confession, to meet the lack of qualified teachers in the German communities and with the leadership of the Riograndense Synod, radically changed the structure that maintained until then, as a German Evangelical Teacher Training Seminar. But what has changed is not just that: before, teaching at the institution was taught in the German language by mostly German professors; from 1950 onwards, the new school implemented a curriculum proposal that complied with Brazilian legislation and, therefore, issued certificates that enabled its graduates to take up teaching at any school. It abandoned the former designation of Lehrerseminar, renamed to the Escola Normal Evangélica and adopted a curriculum that complied with the provisions of the Organic Law for Normal Education. The changes were big: books by Brazilians replaced the old German manuals, the curriculum complied with the law, but kept the German language as a foreign language. However, the first teachers continued to be mostly Germans, although they were progressively replaced by Brazilians. Regardless, the partnership with Germany never ceased to exist and the School continued to send students to receive additional studies in higher education schools in that country, as in the case of the deponent Hermedo Wagner. This strategy guaranteed an approximation with German pedagogy. Travelers brought in their luggage German textbooks as well as an experience with practices in German schools. Thus, somehow, a strategic link was maintained between the two countries.

The mathematical knowledge taught in the first years of the normal course differed little from those of other regional normal schools, involving the contents of Arithmetic, Algebra and Geometry. When Escola Normal Evangélica became a secondary school, there were some changes in the teaching provided, which were not covered in this study. The deponent Wagner reported that math didactics, which he taught for many years, was greatly influenced by his experience in Germany, by the deepening of Piaget's educational psychology and by his contacts with other Brazilian educators. The approximation of the Escola Normal Evangélica with the Instituto de Educação General Flores da Cunha occurred when the referred teacher began to attend courses open to the teachers offered there. Thus, new characters from the international educational scene were introduced to him and the direct contact with Zoltan Dienes enabled the teacher to take the pedagogical ideas that circulated in large cities to the Escola Normal Evangélica.

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Notes

1 Data collected in the digital library of the National Library, available at <http://memoria.bn.br/DocReader/docreader.aspx?bib=873780&pasta=ano%20191&pesq=escolas>. Accessed on: June 15, 2019.

2 Hans Günther Naumann (1923-2015) was born in Rio de Janeiro. Between 1946 and 1948, he attended the School of Theology in São Leopoldo and also studied Philosophy / Anglo-Germanic Letters at UFRGS between 1947 and 1952. He was director of the Institute of Education in Ivoti.

3 This faculty later integrated UNISINOS.

4 The deponent did not inform the title of the book. It is possible that it is the book – *The New Methods in Arithmetic*, from 1921.

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