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Learning to do and doing to learn: the school-farm model implemented in the federal network of professional agricultural education (1967 to 1986)

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Abstract

This article presents historical understandings regarding the school-farm model implemented in the federal professional agricultural education network (1967-1986). The historiographical research focused on identifying, collecting, and transforming into sources legislative documents, manuals, curricular guidelines, didactic material, among others, produced by the Ministry of Education and agricultural schools. It chooses documentary research as a parameter, and marks intersections between the theory of human capital and the educational model. It also analyses the curricular and organizational assumptions, as well as the functioning of agricultural schools, according to the school-farm model. It is understood that the results indicate that the guidelines for professional agricultural education, implemented through the school-farm model for the training of agricultural technicians, issued by the National Coordination of Agricultural Education, were based on the teaching/working/producing triad, and aimed to train technicians capable of contributing to the modernization of the agricultural sector and the rural environment.

Keywords: Agricultural Schools. Agricultural professional education. School-farm. History of Education.

Aprender a fazer e fazer para aprender: o modelo escola-fazenda implantado na rede federal de ensino agrícola profissional (1967 a 1986)

Resumo

Este artigo apresenta compreensões históricas a respeito do modelo escola-fazenda implantado na rede federal de ensino agrícola profissional (1967-1986). A pesquisa historiográfica centrou-se em identificar, levantar e transformar em fontes documentos legislativos, manuais, diretrizes curriculares, material didático, entre outros, produzidos pelo Ministério da Educação e por colégios agrícolas. Elege como parâmetro a pesquisa documental e marca intersecções entre a teoria do capital humano e o modelo educacional. Também analisa os pressupostos curriculares e organizacionais, além do funcionamento dos colégios agrícolas, segundo o

modelo escola-fazenda. Entendeu-se que as diretrizes do ensino profissional agrícola, implementadas por meio do modelo escola-fazenda para a formação do técnico em agropecuária, emanadas da Coordenação Nacional do Ensino Agropecuário, estavam fundamentadas na tríade ensino/trabalho/produção e visavam a formar técnicos capacitados para contribuir com a modernização do setor agrícola e do meio rural.
Palavras-chave: Colégios Agrícolas. Ensino profissional agrícola. Escola-fazenda. História da Educação.

Aprender a hacer y hacer para aprender: **el modelo escuela-granja implantado en la red federal de enseñanza agrícola profesional** (**1967 a 1986**)

Resumen

Este artículo presenta comprensiones históricas con relación al modelo escuela-granja implantado en la red federal de enseñanza agrícola profesional (1967-1986). La investigación historiográfica se centró en identificar, levantar y transformar en fuentes documentos legislativos, manuales, plan de estudios, material didáctico, entre otros, producidos por el Ministerio de Educación y los colegios agrícolas. Elige como parámetro la investigación documental y marca intersecciones entre la teoría del capital humano y el modelo educacional. También analiza los presupuestos curriculares y organizativos, así como el funcionamiento de los colegios agrícolas según el modelo escuela-granja. Se entendió que las directrices de enseñanza profesional agrícola, implementadas por medio del modelo escuela-granja para la formación del técnico en agropecuaria, emanadas de la Coordinación Nacional de Enseñanza Agropecuaria, estaban fundamentadas en la tríada enseñanza/trabajo/producción y tenían como objetivo formar técnicos capaces de contribuir con la modernización del sector agrícola y del medio rural.
Palabras clave: Colegios Agrícolas. Enseñanza profesional agrícola. Escuela-granja. Historia de la enseñanza.

Introduction

This article presents a historical understanding of the "school-farm" model implemented in the federal network of professional agricultural education, especially in the period from 1967 to 1986, highlighting the intersections of the educational model with the theory of human capital, the organizational assumptions and the functioning of the school-farm and the curricular proposals emanating from the Ministry of Education. The starting point for the research

is 1967, when the federal network of professional agricultural education was transferred (Brasil, 1967) from the Ministry of Agriculture to the Ministry of Education and when this education was reconfigured according to the principles of the school-farm model. The deadline for this research was 1986, when the Coordenação Nacional do Ensino Agropecuário/COAGRI (National Coordination of Agricultural Education) (Brasil, 1986), a Ministry of Education body created in 1973 to administer and monitor this model, was abolished.

The National Coordination of Agricultural Education (COAGRI, in the Portuguese acronym) was the main body of the Ministry of Education that led the implementation of the political-pedagogical model called school-farm throughout the federal agricultural education network. COAGRI functioned as an agency of the authoritarian government – the result of the civil-military dictatorship that ruled Brazil at the time – ensuring the centralization and standardization of the political-pedagogical guidelines and orientations of the school-farm for the federal agricultural colleges (Lima, 2021). The period of consolidation of the school-farm model for many federal schools began in 1976, after the work of COAGRI. That year, all 23 federal agricultural schools – later called federal agrotechnical schools – were required to follow the guidelines of the school-farm model (Brasil, 1976a.).

The documentary research focused on identifying, collecting, and transforming into sources legislative documents, manuals, curricular guidelines, teaching materials, among others, produced by the Ministry of Education and agricultural colleges. The documentation was collected from archives and/or physical and digital collections: INEP-CIBEC, the National Archives in Brasilia, the Ministry of Education, and the collection of the Federal Institute of Sergipe/São Cristóvão Campus. The research also collected authoritative references on the historical configurations of agricultural education (Mendonça, 1997; Nascimento, 2004; Conceição, 2012; Nery, 2019) and references that present interpretations of the school-farm model (Tavares, 1992; Rodrigues, 1999; Miranda, 2011).

The "representation" category identified the links between the school-farm model and the technological modernization and rural development project in Brazil during the period studied. We also observed COAGRI's participation in the process of implementing the school model and in monitoring the network of professional agricultural education. Starting from these articulations and processes, one can "[...] understand the mechanisms by which a group

imposes, or tries to impose, its conception of the social world, the values that are its own, and its dominance" (Chartier, 1990, p. 17).

That said, the article still has four subdivisions, in addition to the introductory aspects. The first, entitled *School-farm model: education, work and production*, the contours related to the appropriations of the theory of human capital in the idealization of the school-farm model are discussed; in the second, entitled *Assumptions for the organization and operation of the school-farm,* the aims of the model related to the formation of agricultural technicians at secondary level are highlighted, as well as the investments in the general infrastructure of the schools and the counterpart requirements on their part, in addition to the emphasis on the formation of the professionals who worked in the agricultural colleges; the third part, entitled *School-farm model and curricular proposals for professional agricultural formation*, emphasizes aspects of the curricular organization of the school-farm model, presenting its constitution by integrating four dimensions of the school-farm: Classroom, Practice and Production Laboratory (LPP, in the Portuguese acronym), Guided Agricultural Program (PAO, in the Portuguese acronym) and the Cooperative; and then the final considerations are presented.

School-farm model: **education**, **work**, **and production**

The motto "*learn to do and do to learn*" marked out the professional agricultural education offered in the federal network of agricultural colleges under the Ministry of Education in the 1970s and 1980s, with characteristics similar to educational models that associated pedagogical practice with observation, experience, practicality, reality and usefulness. However, it is necessary to consider an important element for understanding work as a pedagogical principle, as it was appropriated in the very context of the elaboration and dissemination of the school-farm model. That is, the circulation in Brazil of the theory of "human capital", especially in the 1970s. In fact, the debate on education and work from the perspective of economics, supported by the theory of "human capital", had important circulation and repercussions in the educational actions and guidelines of that period (Franco, Zibas, 1988). It was believed that human capacity and knowledge represented the product

of investments "[...] predominantly responsible for the productive superiority of technically advanced countries" (Schultz, 1973, p. 35).

The theory of "human capital" was based directly on the relationship between education and work, defending "[...] the idea that the greater the educational investment, the greater the probability of obtaining rates of return" (Franco, Zibas, 1988, p. 100). They also defended the hypothesis that "[...] individuals are more productive the more they are educated" (Gusso, 1975, p. 35). And when it came to professional agricultural education, Theodore Schultz (1973) understood that it would not be possible to obtain the fruits of a modern and productive agriculture without investments in human beings (Schultz, 1973).

Work as an educational principle was also analyzed and seen as an opportunity to develop professional qualifications in a complementary way to education. It can be understood as an educational tool and, therefore, especially in agricultural professional schools, the combination of doing and learning should prevail, so that doing is complementary to learning, in addition to quality and quantity (Franco, Zibas, 1988). The authors draw attention to the risks of a narrow, decontextualized, and abstract analysis of the junction between work and education, since "[...] work as an educational principle should not be based solely on technique, but also on the motives of work activity that reflect the objective conditions of society" (Franco, Zibas, 1988, p. 103). There is a danger that practical goals will override learning goals, and the focus will be exclusively on production.

The pedagogical principle of "learning to do and doing to learn" must also be understood in the light of the aims and conditions imposed on the operation of federal agricultural teaching establishments, especially in the 1970s. Already in this period, the production and teaching objectives reserved for agricultural educational establishments pointed to the risks of their implementation. In the analysis of experts from the National Center for the Improvement of Professional Formation Personnel (CENAFOR, in the Portuguese acronym), the lack of investment in production spaces and the need to produce would put learning in a secondary position. As a result, students would spend most of their time in production, inserted into a routine of manual labor in the field (Brasil, 1979b).

For Mizoguchi (1981), one of the creators of the school-farm model, the model's main objective was not production, but an integral education that would enable students to develop "[...] skills and experiences that are indispensable for retaining the knowledge acquired in theoretical-practical classes [...]" (Brasil, 1972b, p. 1). Thus, the school should be dynamic and integral, allowing for real experiences, and designed for the student "[...] with activities similar to those he will have to face in real life, in his experience with the problems of agriculture" (Brasil, 1972b, p. 1). It was an understanding of teaching that sought to value the integration of theory and practice, school and community, classroom, and reality.

According to Tavares (1992), a consultant for the Ministry of Education on agricultural education issues from 1976 to 1982, production was a priority for the school-farm, whose purpose was to supply the agricultural schools themselves, so students spent most of their time working in the fields. According to him, this was justified by the school's production requirements for its own supply, with the student as the main workforce. In this direction, the *School-farm manual* (1972) emphasized the importance of agricultural production in schools, linked it to the idea of "vocation" and the need for agricultural establishments to develop rural extension and agricultural cooperative actions in order to provide students with "experience with the real problems of agricultural work" (Brasil, 1972a, p. 1).

The demands of agricultural development in Brazil were in line with the nation's general social development prospects, with "production" and its main agent, the individual, as the guiding principle. It was up to education to prepare them as an investment prerogative for the expected development. From this perspective, government projects for professional agricultural education in Brazil, especially from the 1970s onwards, were marked by bureaucrats adhering to the theory of human capital and educational models from the United States of America, above all, driven by that country's cooperation agreements with Brazil. In the case of references to the "human capital" theory, it was believed that "[...] a model supposedly applicable to nations seeking to change their economic conditions was being exported" (Freitas; Biccas, 2009, p. 277). The theory was added to the educational policy of governments during the Civil-Military Dictatorship, adopted with the justification of promoting efficiency, productivity, and rationality in the education sector (Sanfelice, 2010).

From 1969, the principles of moral education and civics were incorporated into the school curriculum through the discipline of Moral and Civic Education (Brasil, 1969). The content of this curricular component reinforced the link between education and work through one of its aims, in addition to the "worship of the laws and the homeland", it also legitimized the understanding of work as a human need and the individual as the main responsible for national progress. In this respect, the concepts disseminated in teaching materials such as the Moral and Civics textbook (Brás, 1978), used in the agricultural course at the Benjamin Constant Agricultural College, are illustrative. The book disseminated the idea of work as a factor that generates prosperity. Individuals should be responsible for their own growth and, consequently, for the country's progress. Other social factors that were important to this discussion were disregarded. This perspective was also seen in booklets aimed at rural man (Conceição, Lima, 2021).

Assumptions for the organization and operation of the school-farm

The main challenge for the bodies managing federal agricultural professional education was to prepare a technical professional who could intervene or be an element of rural extensionist in the country's then-vaunted agricultural modernization. Within this vision, the federal agricultural colleges underwent changes to their internal organization and alterations to their educational processes through the adoption of the school-farm model. The challenge of preparing students is set out in the first objective of the school-farm, which makes explicit the intention of providing better professional formation through "[...] experience with the real problems of agricultural work" (Brasil, 1976a, p. 8). The emphasis on student qualifications was also a key feature of the professional formation scenario, especially in the 1970s, after the approval of Law 5.692, of August 11, 1971, which established the guidelines and bases for 1st and 2nd grade education (Brasil, 1971), an attempt to identify the real technical needs for the development of the economy. A professional profile was required that mastered research into agricultural experimentation, because the aim was to implement agriculture with a business focus, which would develop cooperatives and specific rural credit techniques (Queiroz, 1975).

The conditions for the school-farm model to work were based on certain requirements or assumptions, including investment in the school's general infrastructure and the formation of human resources. The aim was to invest in adapting the physical structure, modernizing the equipment, and qualifying teachers and technicians at federal agricultural teaching establishments. All of this was done under the verticalization of the decisions of the Ministry of Education's managerial sectors, within the vision of an authoritarian State.

In the second half of the 1970s, the agricultural colleges in the federal network received investments (expansion of the physical structure and equipment) with a view to further developing the teaching-learning process and diversifying qualifications in order to expand enrollment (Brasil, 1976a). In return, the agricultural colleges were required to use the new spaces and equipment in the day-to-day running of the school-farm, especially in the execution of lucrative agricultural projects. These had a dual purpose, one in the field of demonstration for the students' learning and the other in the school's self-supply, helping to reduce financial costs. By analyzing a list of 30 agricultural and livestock farming projects drawn up by the agricultural colleges and approved by the COAGRI team for funding by the Ministry of Education, it was possible to identify the emphasis on the teaching/work/production triad (Brasil, 1976a). Thus, the requirement for indicators of productivity and income earned appears prominently in the reports of the agricultural projects carried out and sent by the agricultural colleges to COAGRI/ Ministry of Education (Brasil, 1979b).

In 1979, of the reports sent by 28 agricultural colleges to COAGRI/ Ministry of Education, only four did not submit projects. The production of each school ranged from zero to 200% of their income. Out of a total of 28 schools, 12 had an output of more than 100% and two had no output. These results were used by COAGRI/Ministry of Education to evaluate its investment policy in expanding and modernizing agriculture and human resources (Brasil, 1979b).

With regard to the results of the investments in formation of agricultural technicians, COAGRI took it upon itself to publicize the advantages of adopting the school-farm model throughout the federal network of agricultural colleges in 1983 in an article published in the *Revista de Educação* (Education Magazine), entitled *Escola-fazenda uma experiência vitoriosa* (School-farm: a

successful experience). In this article, COAGRI publicized the experiences of the Escola Agrotécnica Federal de Bento Gonçalves (Federal Agrotechnical School of Bento Gonçalves), in Rio Grande do Sul. According to COAGRI technicians, Bento Gonçalves was a school that managed, through the school-farm model, to develop within the national parameters of agricultural modernization, especially by offering a technical course in Agriculture. According to the article, this school prepared technicians to work in the State and private sectors, in technical assistance and rural extension activities, research, development, rural credit, marketing and cooperatives (COAGRI, 1983a).

Also published in 1983 in *Revista Educação* (Education Magazine), was a speech by the Minister of Education and Culture, General Rubem Ludwig, who was the paranymph for 92 graduates of the agricultural technician course at the Federal Agrotechnical School in Barbacena, Minas Gerais. The minister's words expressed the federal government's enthusiasm for agricultural education, the challenge facing future professionals and the recognition of the students graduating from the agrotechnical schools as "[...] an ideal model of the new Brazilian – a simple man, without ideological ties or elitist deformations of any kind" (COAGRI, 1983b, p. 56).

In the process of organizing and running the school-farm, investments in the technical and professional qualifications of teachers and managers of the agricultural schools were also on the agenda, as well as an adequate pay for teachers so that they could work on exclusive dedication basis (Brasil, 1972a). For this investment, COAGRI, in partnership with the National Center for the Improvement of Professional Formation Personnel (CENAFOR, in the Portuguese acronym), was given the task of qualifying teachers and technicians for professional courses, as well as developing pedagogical methods for professional formation and developing cooperation with national and international bodies (Brasil, 1979b).

The Ministry of Education, through COAGRI and CENAFOR, developed the project "Capacity of human resources for agricultural education". Its goals were planned for the period 1975-1979 and were related to formation for directors and coordinators, as well as the improvement, qualification and updating of teachers in the pedagogical and specific areas of agricultural education. From 1976 onwards, COAGRI prioritized the qualification of human resources aimed at updating and expanding professional education, especially due to its interest in expanding the school-farm model. The courses

and seminars held in agricultural educational establishments aimed to qualify human resources through the new high school curriculum, the operation of cooperatives and the theoretical deepening of the special formation of this type of education (Brasil, 1976b; 1978; 1979a, 1982).

Further formation and qualification for high school agricultural teachers was planned and carried out between 1974 and 1979, reaching a total of 695 participants, 85 of whom were trained in Scheme I (teachers and holders of undergraduate education diplomas with specific qualifications), 113 in Scheme II (teachers, holders of technical and high school education diplomas), 222 in further formation courses and 15 in graduate courses. The evaluation of investments in human resources, especially in the qualification of teachers, technicians, and directors of the federal education network, can be identified through the results obtained by the education network throughout COAGRI's activities.

In addition to courses for teachers, formation courses were organized for directors and technicians of agricultural teaching units. These courses took place every year, "[...] with the aim of exchanging experiences, discussing and analyzing problems related to the areas, and promoting links with other bodies working in the primary sector" (Brasil, 1979a). One of the national meetings between technical managers subordinate to the Ministry of Education, which took place in Brasilia, capital of Brazil, from May 18 to 21, 1982, was the 1st Technical Meeting of Ministry of Education Managers, attended by directors of agricultural colleges and the general director of COAGRI, Oscar Lamounier Godofredo Júnior. The meeting was part of the activities developed by COAGRI in the 1980s. The COAGRI/Ministry of Education managers pointed out their concern with a form of education that would boost agricultural development and, to this end, pointed out the need for investment in formation of human resources in the light of technological evolution and the development of the country's economy (Brasil, 1984).

The school-farm model and curricular proposals for agricultural professional formation

In order to comply with the organizational guidelines and the functioning of the school-farm, as indicated earlier in this article, professional

agricultural formation in the school-farm model initially established a curricular organization made up of the integration of four dimensions: the Classroom, the Practice and Production Laboratory (LPP), the Guided Agricultural Program (PAO) and the Cooperative. The first representation of the school-farm model indicates these four teaching dimensions (Classroom, LPP, PAO, and Cooperative) and the emphasis on the relationships between them. This composition underwent some modifications during the implementation of the school-farm model at the federal agricultural colleges. One of them is related to the Guided Agricultural Program (PAO), which was gradually deactivated.

From 1985 onwards, there was a second change and the Practice and Production Laboratories were renamed Production Education Units (UEPs, in the Portuguese acronym). The creation of these units was justified by the need to use classrooms installed in the UEPs themselves for the development of theoretical classes in Agriculture and Zootechnics (Tavares, 1992). As a result of these changes, the school-farm model was represented by just three dimensions: the Classroom, the UEPs and the Cooperative.

The indication of interdependence between the different dimensions is attributed to the guiding principle of the school-farm model – *learning to do and doing to learn* – referring to the eminently practical and demonstrative dimension of agricultural professional education. The principle would be realized to the extent that *learning to do* corresponded to field orientation classes and the teaching of curricular disciplines carried out in the classroom or in the Practice and Production Laboratories or in the Educational Production Units. *Doing to learn* was associated with working in the fields, in practical and production laboratories and in guided agricultural programs, in compliance with the didactic guidelines included in practical teachings.

The new needs were reflected in the incorporation of new techniques, new pedagogical knowledge, and new teaching parameters. Teaching became more complex, requiring more performance from student-workers, human resources who "[...] will handle the equipment, the machines, and also the organization itself, which is also becoming more complex as a result of this technological progress" (Gusso, 1975, p. 36). In the 1970s, especially after the institution of Law 5.692, of August 11, 1971, which established the Guidelines and Bases for 1st and 2nd grade education (Brasil, 1971), the dissemination of meanings about theory and practice in professional agricultural education can also be observed from the discussion about "thinking and

doing", inseparable dimensions in the instructional process of individuals. Also in 1967, the Directorate of Agricultural Education (DEA), in accordance with Ordinance No. 29/1967, instituted a new curriculum system for high school agricultural education, considering "[...] effectively, the technical and socioeconomic conditions of the environment in which it is located" (Brasil, 1970a, p. 7). The curriculum was flexible and could be adjusted according to the possibilities of each school. The courses were to be taught in two cycles: junior high school, lasting four years, and high school, at least three years. In the curriculum of the second cycle, general culture disciplines comprised certain curricular components: Portuguese, Math, Biology, Chemistry, plus an optional discipline of the school's choice from the following: Physics, Drawing, Modern Foreign Language, Economics and Social Sciences. As for the second cycle curriculum, the technical disciplines for the agricultural high school course included: I Agriculture; II Zootechnics; III Rural Industries; IV Agricultural Mechanics; V Rural Economics (Brasil, 1970b). Table 1 below shows the curricula adopted in Professional Agricultural Education for the years 1968, 1972, 1976 and 1986. It is possible to see certain continuities and changes in the process of curricular organization in this branch of professional education.

Table 1 - Curricula for basic agricultural formation (1968, 1972, 1976, 1986)

Year	1968	1972	1976	1986
Disciplines (General Culture)	1. Portuguese	1. Portuguese	1. Portuguese	1. Portuguese
	2. Math	2. Math	2. Math	2. Math
	3. Biology	3. Science	3. Physical and Biological Sciences	3. Physics
	4. Chemistry	4. Geography	4. Geography	4. Chemistry
		5. History	5. History	5. Biology
	Optional disciplines	6. E.M.C.	6. E.M.C.	6. Geography
	Physics	7. Art Education	7. Art Education	7. History
	Drawing	8. Foreign Language	8. Foreign Language	8. E.M.C.
	Modern Foreign Language	9. O.S.P.B.	9. O.S.P.B.	9. Art Education
	Economics			10. Foreign Language
	Social Science			11. O.S.P.B.
				12. Health Program

Table 1 - Curricula for basic agricultural formation (1968, 1972, 1976, 1986) continuação

Year	1968	1972	1976	1986
Disciplines (Technical Culture)	1. Agriculture	1. Agriculture	1. Agriculture	1. Agriculture I
	2. Zootechnics	2. Zootechnics	2. Zootechnics	2. Agriculture II
	3. Rural Industries	3. Rural Administration and Economics	3. Agricultural Economics and Administration	3. Agriculture III
	4. Agricultural mechanics	4. Writing and Expression	4. Occupational Guidance Program	4. Zootechnics I
	5. Rural Economy	5. Regional Studies	5. Basic Drawing	5. Zootechnics II
		6. Drawing and Topography	6. Chemistry	6. Zootechnics III
	Educational Practices	7. Construction and installations	7. Biology	7. Irrigation and Drainage
	Physical education	8. Irrigation and Drainage	8. Physics	8. Construction and installations
	Art Education	9. Crops		9. Rural Administration and Economics
	Human Relations	10. Health Program		10. Drawing and Topography
	Guided Agricultural Program			
Workload	2.010		2.250	3.870

Source: Table drawn up by the author (BRASIL, 1970a; 1971; 1972c; 1977; 1985).

The curricula presented in table 1 generally indicated the current curricular proposal for formation students to work professionally in the agricultural sector, in the areas of production, as a propagator of technologies and in the areas of rural credit, cooperatives, agroindustry and rural extensionist. The first curriculum (1968) shown in the table above, dated 1968, complied with the guidelines of LDB No. 4,024 of December 20, 1961. For its organizers, the proposal was not considered an innovation, but rather the result of a series of studies aimed at rationalizing professional agricultural education, which, for them, contributed significantly to the national economy (Brasil, 1970a). In this curriculum, we can initially observe a characteristic common to all the others analyzed: the attempt to organize the curricular components of general and

technical culture. Thus, four general culture disciplines and five technical culture disciplines were established. The curriculum also included optional disciplines and so-called educational practices. The latter represented regular activities carried out at the school, consisting of Physical Education, Art Education, Human Relations, and the *Oriented Agricultural Program*.

Looking at the number of disciplines, we can see that there is a balance in the distribution of general (seven components) and technical (eight components) curricular components, not including optional disciplines, since only one discipline had to be chosen. The combination of education and work was provided for in the 1968 curriculum. The 1972 and 1976 curricula offered the same number and type of disciplines, except for the science disciplines, which were named in 1976 Physical and Biological Sciences. Understanding the many changes that took place in the curricula in the 1970s is related to the context of implementing laws and ordinances created to meet the educational policy conceptions of the authoritarian government then in force in Brazil.

Law 5.692, of August 11, 1971, which established the Guidelines and Bases for 1st and 2nd grade education (Brasil, 1971), presented a different proposal or perspective for what was then known as 2nd grade education, previously known as "collegial" (the name of old secondary degree in Brazil). And it proposed reforming it in order to qualify it for work, according to Opinion 45/1972, of the Federal Education Council, with the justification of adjusting this education to the needs of new sectors of production dependent on specialized labor, "[...] within which the use of techniques whose learning is practically only accessible to those who attend school, in a systematic way, over several years, is beginning to spread with a speed never known before" (Brasil, 1972c, p. 9). The Opinion 45/1972 also established the minimum required for each professional qualification, above all the "[...] principle of professionalization of 2nd grade education" (Warde, 1979, p. 17).

For 2nd grade education, in addition to the common core, the minimum to be required in each professional qualification was defined, with "[...] the predomination of special formation component" (Brasil,1971). The curriculum included a division between general education and special education, which was referred to in Opinion 45/1972 as the division between humanism, for general education, and technology, for special education, it also emphasized: "The special education component of the curriculum: a) Will have the objective of probing aptitudes and initiation into work, in 1st grade,

and *education and professional qualification, in 2nd grade education*" (Brasil, 1971, emphasis added).

Entry to 2nd grade education required completion of 1st grade education or equivalent studies, offered in three or four annual series (Brasil, 1971). The number of disciplines increased between the two types of education (general and special), as 9 of the 19 curricular components were general education, while 10 were special education. In addition to this change, the workload was also higher than in the previous curriculum. The total workload of disciplines in the special education category (Drawing and Topography, Construction and Facilities, Agriculture, Zootechnics, Irrigation and Drainage, Crops) was 1,500 hours/class, slightly more than the total hours/class required for general education, 1,140 hours/class.

The 1970s saw the start of the process of expanding the school-farm model in the federal agricultural schools and, with the implementation of this curriculum, the aim was to integrate the learning of theoretical and practical disciplines. At that time, government bodies, through specific documentation, tried to convey the understanding that professional education needed to be more than formation; it should "[...] allow the student to better understand the world in which he lives, while at the same time giving him a knowledge base that will allow him to readapt to the changes in the world of work" (Brasil, 1975, p. 11).

The curricular proposal for the basic agricultural qualifications, from 1976 onwards, presented the distribution of the workload by discipline, with an increase in the total workload and some modifications to the curricular components, both general and special education. Of the disciplines specific to agriculture, the following were maintained: Agriculture, Zootechnics, Agricultural Economics and Administration and Basic Drawing. The disciplines Irrigation and Drainage, Constructions and Installations and Crops, which were present in the 1972 curriculum, were not included in the 1976 curriculum, but reappeared in 1986. For general education, there was a redistribution of science disciplines, with the addition of Chemistry, Biology and Physics, which were considered special education disciplines.

In the second decade of the 1970s, the debate in the field of professional formation related to basic formation in agriculture and livestock farming was aimed at expanding this education in order to arouse young people's

interest in working in the agricultural sector (Brasil, 1977). Other aspects observed in this period regarding the professionalization of agricultural education are related to at least three characteristics: 1) the interdependence of agricultural activities, 2) the existence of a job market (rural extension agent, farm manager, rural producer); and 3) the existence of specialized occupations (Brasil, 1977). These aspects can be identified, from the 1976 curriculum onwards, in the restructuring of the discipline Agricultural Economics and Administration – with the indication of content related to agricultural administration, agricultural marketing, rural extension, economic problems and agricultural administration - and in the insertion of the Occupational Guidance Program (Brasil, 1975).

The discipline of Agricultural Economics and Administration was present in the four curricula under discussion, but with different names and workloads. In the 1968 curriculum, two disciplines were offered: Rural Industries (180 hours) and Rural Economics (60 hours); in 1972, the two disciplines were combined under the name of Rural Administration and Economics (60 hours); in 1976 it was renamed Agricultural Economics and Administration (210 hours); and finally, in the 1986 curriculum, this discipline was renamed Rural Administration and Economics (90 hours). The aim of this discipline was to address the problems of plant and animal production, the characteristics of the production and marketing process, as well as the identification of business activities, with a view to supporting the agricultural sector (Brasil, 1975). According to its aims, it was intended to enable students to participate in the planning and marketing of products and to instill notions of cooperatives and rural extension, with the aim of developing rural areas.

The *Occupational Guidance Program's* objective was to "[...] prepare and/or orient students for agricultural occupations through activities identified according to their needs, interests, aspirations and requirements for entry into employment" (Brasil, 1977, p. 41). The purpose of this curricular component was to provide students with information on possible agricultural occupations, preparing them for the job market, while at the same time instilling an appreciation for agricultural activities. The *Occupational Guidance Program* was not included in the 1986 curriculum. Another curricular component that complements the students' professional formation – Supervised Internship – was included in the 1986 curriculum, as specified in table 2.

Table 2 – Curriculum of the agricultural course from 1986

Common Core	General education					Special education				
	Disciplines	Grades			Horas	Disciplines	Grades			Horas
		1ª	2ª	3ª			1ª	2ª	3ª	
Communication and Expression	Portuguese Language and Brazilian Literature	3	3	2	240	Writing and Expression	-	-	2	60
	Art Education	2	-	-	60					
	Foreign Language	-	2	-	60					
Social studies	History	2	-	-	60	Regional Studies	-	-	2	60
	Geography	2	-	-	60	Rural Administration and Economics	-	-	3	90
	O.S.P.B.	-	2	-	60					
	Moral and Civic Education	2	-	-	60					
Science	Math	3	3	2	240	Drawing and Topography	-	4	-	120
	Physics	-	2	2	120	Agriculture I	8	-	-	240
	Chemistry	2	2	-	120	Agriculture II	-	8	-	240
	Biology	2	2	-	120	Agriculture III	-	-	8	240
	Health Program	2	-	-	60	Animal Science I	8	-	-	240
						Animal Science II	-	8	-	240
						Animal Science III	-	-	8	240
						Irrigation and Drainage	-	-	3	90
						Construction and Facilities	-	-	3	90
Others	Physical Education				270	Supervised Internship	-	-	-	360
	Religious Education				30					
General Education:		24	19	09	1.560		16	20	29	2.310
Grand Total: 3.870										

Source: Brasil (1985).

This curriculum for the agriculture and livestock farming course saw a reorganization in the distribution of disciplines and an increase in the total workload of the curricular components. The general education disciplines were not changed, but were reallocated, in the case of Chemistry, Physics and Biology, from special education, which were present in the 1976 curriculum, to general education. As for special education, all the disciplines from the previous curriculum were kept, but Agriculture and Zootechnics were subdivided into three, with a greater workload. Thus, Agriculture went from 240

hours/class to 720 hours/class and Zootechnics from 150 hours/class to 720 hours/class. Supervised Internship was also added.

The reorganization of the curriculum pointed to the distinction and objectivity of the disciplines according to each type of formation, noting that there was greater scope for special formation with the increase in the workload and the inclusion of Supervised Internship. This curricular component was responsible for linking the school and the community, companies, and family farms, by carrying out projects in the areas corresponding to the Educational Production Units (Brasil, 1985). The curriculum proposal was in line with the objectives defined by COAGRI in 1985, and met the need for professional formation in the areas of livestock farming, agriculture, oenology, and home economics, aimed at areas of production, technology dissemination and regional development, through guidance on rural credit, cooperatives, agroindustry, and rural extension (Brasil,1985).

Final considerations

The political-pedagogical guidelines for professional agricultural education were intended to implement a specific pedagogical model for the preparation of mid-level agricultural technicians, capable of meeting the demands of the existing or emerging job market, which required qualifications in agricultural extension, rural credit, production, and the use of machinery. In response to these demands, the school-farm model was implemented by the Ministry of Education in 33 schools in the federal network of professional agricultural education between 1967 and 1986, which resulted in changes to the space and time of the agricultural schools and a re-signification of pedagogical practices emphasizing the teaching/work/production triad, represented by the propaganda slogan "learning to do and doing to learn".

The implementation and operation of the school-farm model in the federal network of agricultural colleges was driven by international funding, the general guidelines issued by the Ministry of Education and the specific conditions of each agricultural college. The funding, the result of agreements and/or covenants with international organizations, especially those led by the United States of America, promoted technical and financial assistance for agricultural schools, resulting in the modernization of facilities and equipment

and the qualification of professionals. All of this was characterized by the idea of development and alignment with US policy for the region, based on the theory of "human capital." The investments in agricultural education required a counterpart on the part of the agricultural colleges, such as the implementation of the school-farm model, an increase in the number of places on offer and the use of facilities and equipment in the teaching-learning process, especially in the execution of agricultural projects that would result in productivity. These had a dual purpose: they served as a demonstration field for the students' learning and as self-supply for the school, helping to reduce costs.

The documents that governed the parameters of the school-farm model were based on the idea or confidence in the functioning of a system organized by areas or dimensions – Classroom, Practice and Production Laboratory (LPP), Guided Agricultural Program (PAO) and School Agricultural Cooperative (COOP) – which should function in a situation of interdependence between the integral parts. This concept remained in force throughout the period studied, although it underwent changes in nomenclature and the addition of new elements.

The political-pedagogical proposal for professional formation, based on the teaching/work/production triad, explains the broad defense of the execution of agricultural projects as an instance of learning ("learning by doing"). The emphasis on the need for technical and economic viability of the agricultural projects to be developed by the schools was a strategy to highlight the success of the school-farm model, without forgetting the focus on the school's self-sufficiency.

The motto of the school-farm educational model – "learning to do and doing to learn" – represented the defense of the connection between theoretical and practical knowledge and learning. However, this proposal did not always work. The general knowledge disciplines presented difficulties in integrating the classroom and field practices. In these disciplines, students maintained more academic interests, aimed at progressing to higher education. With regard to professional disciplines, the opportunities for interaction between teaching and learning areas were greater, especially with regard to activities related to the execution of agricultural projects, which highlighted another purpose of the model in question: the school's need for self-sufficiency.

The motto "learning to do and doing to learn" should also be understood in terms of the production purposes reserved for agricultural educational

establishments, a situation that resulted in risks for their execution, causing fear among scholars in the agricultural sector. In this regard, experts in the field pointed out that the requirement for schools to provide proof of agricultural production in their reports placed learning in a secondary position. Students would spend most of their time in production, turning their activities into routine manual labor in the fields, often unrelated to specific technical formation. Even so, the school-farm model persisted and continued to face challenges, aiming to form technicians capable of contributing to the modernization of the agricultural sector and the rural environment, despite the difficulties and the risk of the predominance of productivism over learning.

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