The modular education system in rural schools in Tomé-Açu, Pará, Brazil: a participative research

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Abstract: This article presents the results of a qualitative study developed in 2019. The aim was to know and discuss obstacles and possibilities to promote adequate education to fulfill the needs of middle-school students. We conducted the research in four schools of Field Education in the Tomé-Açu, in the state of Pará, which use the Modular Organizational System, Alternance Pedagogy, and interdisciplinary projects. The research is grounded on the dialectic method, seeking to discuss and reflect the educational reality in a rural context. Thus, we were guided by official national and municipal documents. The study has shown the contextualization of the curriculum with students’ experiences, emphasizing the problems and strategies developed to guarantee the offer of a more useful, viable, possible, and contextualized school education.

Keywords: Alternance Pedagogy. Family Agriculture. Field Education. Science Education. Education Project.

El sistema modular de enseñanza en escuelas del campo del municipio paraense de Tomé-Açu: una investigación participativa

Resumen: Este artículo presenta los resultados de una investigación cualitativa desarrollada en 2019. El objetivo fue conocer y discutir problemas y posibilidades para la promoción de la enseñanza escolar adecuada a las necesidades educacionales de los estudiantes de los cuatro últimos años de la Enseñanza Primaria (Fundamental). La investigación fue realizada en cuatro escuelas de Educación del Campo del municipio paraense de Tomé-Açu, donde los alumnos son sometidos al Sistema Organizacional Modular, al Régimen de Alternancia y a la enseñanza por proyectos interdisciplinarios. Es una investigación basada por el método dialéctico que busca discutir y reflexionar sobre la realidad educacional en territorio campesino. De esta manera, se orientó por los documentos curriculares oficiales nacionales y municipales. Como resultados alcanzados, el estudio evidenció la contextualización del currículo con las vivencias de los educandos, dando énfasis en los problemas y estrategias desarrolladas para garantizar el brinde de una enseñanza escolar más útil, viable/posible y contextualizada.


O sistema modular de ensino em escolas do campo do município paraense de Tomé-Açu: uma pesquisa participativa

Resumo: Este artigo apresenta os resultados de uma pesquisa de abordagem qualitativa desenvolvida em 2019. O objetivo foi conhecer e discutir entraves e possibilidades para a promoção de ensino escolar adequado às necessidades

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educacionais dos estudantes dos quatro últimos anos do Ensino Fundamental. A investigação foi realizada em quatro escolas de Educação do Campo do município paraense de Tomé-Açu, nas quais os alunos são submetidos ao Sistema Organizacional Modular, ao Regime de Alternância e ao ensino por projetos interdisciplinares. É uma pesquisa pautada pelo método dialético que busca discutir e refletir sobre a realidade educacional em território campesino. Dessa forma, nortear-se pelos documentos curriculares oficiais nacionais e municipais. Como resultados alcançados, o estudo evidenciou a contextualização do currículo com as vivências dos educandos, dando ênfase nas problemáticas e estratégias desenvolvidas para garantir a oferta de um ensino escolar mais útil, viável/possível e contextualizado


1 Introduction


Speaking from a more epistemological perspective on the principles and purposes of school education, in the second half of the 1990s, the Parâmetros Curriculares Nacionais (PCN) [National Curriculum Parameters] (BRASIL, 1998; 1999) point out that school education must be contextualized to be more attractive and useful for students.

In contemporaneity, we see this conception of school education being increasingly present in normative documents, for example, in the Diretrizes Curriculares Nacionais para a Educação Básica (DCN) [National Curriculum Guidelines for Basic Education] (BRASIL, 2013) and the Base Nacional Comum Curricular (BNCC) [National Common Curriculum Base] (BRAZIL, 2017), which discuss the need to contextualize school contents faced with the sociocultural and economic reality of students. Thus, holistic school education for citizenship is necessary for individuals to overcome their limits (many of these imposed on them by their economic and socio-historical conditions) and be able to think critically, acting on the different dimensions of life in society, in view of their individual and collective/social development.

As expressed in the LDB (BRASIL, 1996), school education is a basic
constitutional right that must be guaranteed to all. However, the peoples who live in field areas, especially the most isolated ones, do not fully have this right (LIMA and MELO, 2016), because, according to the DCN (BRASIL, 2013), in the countryside, the educational reality remains marked by the lack of functional public policies that guarantee the full right to school education. As a result, those peoples are also on the margins of other basic rights since, without school education, other accesses are more difficult (GADOTTI, 2000). In this context, we realize the importance of a public school didactic-pedagogically adjusted to the educational needs of the place where it is inserted.

As in other municipalities in the northern region of the country, the municipality of Tomé-Açu, in the State of Pará, faces the following challenge about its field schools: to offer teachers from specific areas of knowledge to field schools that, besides presenting a low number of students, are still located far from each other and from the headquarters of the municipality. So, to face this problem, and based on Art. 23 of the LDB (BRASIL, 1996), the Municipal Council of Education of Tomé-Açu, through Resolution No. 3, of December 22, 2011, adopted the Sistema Organizacional Modular [Modular Organizational System] and Regime de Alternância [Alternation Regime] to serve students of the four Final Years of Elementary School in their field schools. Field education here is defined by Art. 78:

[...] the modality of school education, offered to the field population, in its various forms of life production – family farmers, extractivists, artisanal fishermen, riverside dwellers, settlers and camps of agrarian reform, quilombolas [inhabitant of communities formed mostly by remnants of fugitives from slavery], caícaras [native or inhabitant of the coast], indigenous and others – in the Municipal Education System of the Municipality of Tomé-Açu (state of Pará) should be promoted through the implementation of the necessary adjustments for its adaptation to the peculiarities of field life and each community, especially: I. Curricular contents and methodologies appropriate to the real needs and interests of students in field areas [...] (TOMÉ-AÇU, 2011, p. 19).

And about the field school, in its Art. 80, this same resolution says that:

The identity of the field school is defined by its link to the inherent issues of its reality, being anchored in the temporality and students’ own knowledge, in the collective memory that signals futures, in the science and technology network available in the society and in the social movements in defense of projects that associate the solutions required by these issues to the social quality of collective life in the country (TOMÉ-AÇU, 2011, p. 19).

Due to this format of curricular organization, the teaching plans of these schools
are articulated for the development of teaching-learning projects in the perspective of interdisciplinary and contextualized teaching, aiming to value the field cultural identity, in line with the classical school contents of the official curriculum. These actions are possible because Art. 23 of the LDB (BRASIL, 1996) authorizes educational systems to organize the format of teaching offers and schools to establish their Political-Pedagogical Projects (PPP) and teaching plans.

Thus, we understand that it is necessary/important to know and discuss the teaching praxis in these schools due to autonomy and the obstacles that each education system needs to face to, on the one hand, comply with the legislation, and on the other, offer appropriate school education to the local and regional students’ characteristics.

Given the above, this article presents the results of a research that sought to answer the following question: by offering school education through the Sistema Organizacional Modular, Regime de Alternância and development of interdisciplinary teaching-learning projects, the Field Schools of the municipality of Tomé-Açu (State of Pará) can promote educational actions that meet educational regulations and, at the same time, are consistent with the educational needs of the rural student?

Searching for an answer to this question, and based on legal curriculum guidance, this research had the general objective of knowing and discussing obstacles and possibilities for the promotion of adequate school education to the educational needs of the students of the last four years of Elementary School of four schools of Field Education in the municipality of Tomé-Açu (State of Pará), submitted to the Sistema Organizacional Modular, to the Regime de Alternância, and to the teaching by interdisciplinary projects.

To achieve the objective, the methodological research plan sought the following specific objectives: 1) Explain the structural organization of the Regime de Alternância, Sistema Organizacional Modular, and teaching offer by interdisciplinary teaching-learning project in Field Schools of the municipality of Tomé-Açu (State of Pará); and 2) Present and discuss the results of school productions developed in 2019 by the students of these four schools involved in an interdisciplinary project.

It is worth mentioning that, in this work, the idea brought by the High School PCN (BRASIL, 1999) and ratified by the BNCC (BRASIL, 2017) is adopted as contextualization, in which it is said that contextualization is not just explaining the
school contents by citing examples from the students’ daily lives. According to these official curriculum documents, the school study is contextualized when the teaching method and language find anchoring points in the student’s cognitive structure. And it is in the well-designed planning that the teacher, when knowing as much as possible about his students, will decide which techniques, strategies, and instruments will best enable the occurrence of this anchorage, in view of the occurrence of new intentional learning, systematized by the cognoscenti subject.

2 Methodology

This research was developed in 2019 in four Field Schools in Tomé-Açu (state of Pará), based on the dialectical method (LAKATOS and MARCONI, 2003). The target audience was 227 students from the last four years of Elementary School and two teachers that, together with the researcher, work in these schools and, therefore, with this curricular organization. As a technique and data collection instrument, we used a semi-structured questionnaire with open questions (applied to the two teachers after they signed the Termo de Consentimento Livre e Esclarecido [Free and Informed Consent Term]), systematized registration, and direct researchers’ observation of the students’ productions and participation in the activities.

In the observation, we followed this protocol: 1) Student engagement in the activities; and 2) Possibility of replanning the activities during the execution, path without totally and/or partially compromising its objective.

Based on Laville and Dionne (1999), Gil (2010), and Ghedin and Franco (2011), this research approach is qualitative; it is exploratory, regarding its objectives; and participatory and survey research, regarding its procedures. It is classified as participating research because the researcher, also in the position of teacher, interacted with the target audience in the educational activities that composed the object of study. As Santos and Gamboa (2002) argue, this methodological arrangement — the corpus of the research — is possible because, unlike in the Natural Sciences, in Human Sciences, the researcher does not detach him/herself entirely from his/her object of study.

As Demo (2011) discusses, in the context of school education, the interconnection between researcher and object of study is an important opportunity for the performance of the critical-reflective teacher and teacher-researcher, as it can
develop and/or improve in this professional the competence to study his own praxis and thus generate scientific knowledge when talking to and about the school. Thus, the teacher-researcher occupies a different position from that usually occupied by researchers who are not part of the environment in which the target investigation process occurs, in this case, school teaching-learning.

The teachers who participated in this research have the following profile of training and professional experience, as shown in Chart 1.

Chart 1: Profile of the teachers that participated in the research

<table>
<thead>
<tr>
<th>Profile</th>
<th>Teacher 1</th>
<th>Teacher 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree area</td>
<td>Field Education – Sciences</td>
<td>Biology</td>
</tr>
<tr>
<td>Degree level</td>
<td>Graduate - Specialization</td>
<td>Graduation</td>
</tr>
<tr>
<td>Experience in Basic Education</td>
<td>2 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Experience with Field Education</td>
<td>2 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Experience with the schools of research</td>
<td>1 year</td>
<td>4 years</td>
</tr>
<tr>
<td>Curriculum component taught in these schools</td>
<td>Field Education</td>
<td>Science</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience with SOMEF</td>
<td>2 years</td>
<td>4 years</td>
</tr>
<tr>
<td>Number of classes, students and schools that, respectively, worked in 2019 at SOMEF</td>
<td>16, 227.4</td>
<td>16, 227.4</td>
</tr>
</tbody>
</table>

Source: Elaborated by the Authors

The participating students, on the other hand, have the following profile, as shown in Chart 2.

Chart 2: Profile of students participating in the research

<table>
<thead>
<tr>
<th>School</th>
<th>Year in which the student is attending Elementary School</th>
<th>Number of Boys</th>
<th>Number of Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonieta Paiva Maciel</td>
<td>Sixth</td>
<td>10</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Seventh</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Eighth</td>
<td>7</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Ninth</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Florência Inglis de Paiva</td>
<td>Sixth</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Seventh</td>
<td>12</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Eighth</td>
<td>19</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Ninth</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Sixth</td>
<td>11</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Seventh</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Eighth</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Prof. Crescencio da Graça Paiva</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As we previously informed, the target schools of this research are located in the municipality of Tomé-Açu. Like many in the Northern Region of Brazil, this municipality started from a riverside village (CARDOSO et al., 2020), and this characteristic remains in the way of life of its people. Not only the municipal headquarters, which comprises its urban industrial sector, but its entire territorial dimension is bathed by rivers (ALBUQUERQUE, 2017).

In the period of the Amazon occupation, in the twentieth century, the state of Pará attracted people from other regions of the country and from abroad, immigrants who sought agricultural land. This process of occupation resulted in the ethnic diversity in this municipality, composed mainly of the indigenous peoples Tembé, remnant quilombolas, Japanese, and northeastern Brazilian people (ALMEIDA, SANTOS, and LIMA, 2018). Albuquerque (2017) points out that Tome-Açu is predominantly focused on extractive, agricultural, and livestock activities. The people who live there are distributed in the district regions, urbanized poles, and rural areas.

This municipality is mainly bathed by the rivers Acará-Mirim and Igarapé Mocoões. On the banks of these rivers, there are some riverside communities, served by the municipal schools Santo Antônio II, Antonieta Paiva Maciel, Quilombo Professor Crescêncio da Graça Paiva, and Quilombo Florência Inglis de Paiva. These schools serve a diversity of children and adolescents who are mostly children of agrarian reform settlers, riverside dwellers, quilombola remnants, farmers, and rural workers. These people’s main activity is family-based agriculture, which is not only economically important for them, but holds a whole set of cultural meanings.

In the rural family, the logic of agricultural activity is not given in terms of ownership by the search for a productivity rate and increasing profitability, but by the effort to maintain the family in certain cultural and social conditions, that is, the maintenance of the family property and the agricultural exploitation. The family is a value that is imposed on production, although it is inseparable from the property and farm (SALVODI and CUNHA, 2010, p. 27).
Most of these communities are composed of small farmers who, in addition to agriculture, also practice extractivism, such as hunting, fishing, and collecting fruits and medicinal herbs from the forest of their area of residence, for which they hold a license (BARROS, 2010). Largely, these farmers rely basically on the labor offered by the family members themselves (CORDEIRO, ARBAGE, and SCHWARTZ, 2017).

Only a minority of these farmers rely on machinery to assist with agriculture. Most still use traditional techniques, manually performing most of the work and/or with animal strength (TOMÉ-AÇÚ, 2017). As agriculture is family-based, each family member plays an important role in working with the land. However, children and adolescents have been decreasingly participating, as formerly schools claimed that such participation constitutes exploitation of child labor.

On this issue, Marin (2018) presents different discussions that arise between the State — as an guarantor of civil rights — and the Social Movements, which value the identity of these rural peoples. On the one hand, the State understands that the presence of children in family farming is one of the worst forms of exploitation of child labor. On the other, the social movements advocate against this position and seek to show that children’s participation in family farming is a way of creating and/or maintaining cultural, family, and cooperative ties.

About this discussion, Marin (2018) points out:

Such clashes reveal different conceptions of childhood and child labor. The set of laws, public policies, and educational institutions represent hegemonic processes of the social construction of childhood in the contemporary context, which are guided in the name of integral child development. However, in the family agricultural units, the work of children has always integrated strategies of socialization of the new generations and complementing the workforce in agricultural and domestic activities. Even in contemporary times, family farmers attribute significant value to children’s work, but recognize the importance of school education for the new generations (MARIN, 2018, p. 51-52).

These practices permeate economic reproduction and comprise a series of sociocultural meanings that mark the identity of these peoples. Therefore, denying them can also be understood as an act of cultural exclusion as brutal as the idea of exploitation of child labor.

As can be seen, here we have a very delicate and controversial issue that involves, on the one hand, the conservation of the culture of a people, which is a right guaranteed by our Constituição Federal (BRASIL, 1988), and on the other, every
understanding that today — also with the force of law — we make about the rights of children and adolescents, according to the Estatuto da Criança e do Adolescente (BRASIL, 1990).

3 Results and discussion

3.1 The Sistema Modular de Ensino of the Field Schools of the Tomé-Açu

Of the eight field schools in which the Sistema Organizacional Modular of Ensino Fundamental (SOMEF) operates, the educational offer ranges from Early Childhood Education to the 9th grade of Elementary School. For Early Childhood Education and the first five years of Elementary School, education is offered in the regular modality.

For the last four years, according to Resolution No. 3, of December 22, 2011, of the Municipal Council of Education of Tomé-Açu, teaching is offered through the Sistema Organizacional Modular e Regime de Alternância, complying with the offer of the workload and curricular components that determines the national legislation, according to Chart 3.

Chart 3: Curriculum Matrix of the Field Education of Tomé-Açu

| Curriculum Matrix |
|-------------------|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| Sistema Organizacional Modular dos Anos Finais do Ensino Fundamental em Regime de Alternância |
| Curriculum Basis | Subjects | 6th | 7th | 8th | 9th |
| Knowledge Area | | | | | |
| Languages | Portuguese Language | 6 | 6 | 6 | 6 |
| | Arts | 2 | 2 | 2 | 2 |
| | Physical Education | 2 | 2 | 2 | 2 |
| | English Language | 2 | 2 | 2 | 2 |
| | Mathematics | 6 | 6 | 6 | 6 |
| | Science | 2 | 3 | 2 | 3 |
| | Geography | 3 | 2 | 2 | 2 |
| | History | 2 | 2 | 3 | 2 |
| Religious Education | Religious Education | 1 | 1 | 1 | 1 |
| Diversified Part | | | | | |
| Regional Knowledge | Amazonian Studies | 2 | 2 | 2 | 2 |
| Field Education | Field Ed. and Agroecology | 2 | 1 | 2 | 1 |
| Education Diversified | Afro-Brazilian and Indigenous Culture | 1 | 1 | 1 | 1 |
Total Weekly Classes Hours | 30 | 30 | 30 | 30  
Total Annual Workload     | 1200| 1200| 1200| 1200

Source: Municipal Department of Education and Sports of Tomé-Açu

With SOMEF, each of the eight schools receives four modules over the course of a school year, organized according to the workload of each curricular component (Chart 4). With this curricular organization, Tomé-Açu seeks to circumvent two problems with its Field Schools: 1) Difficult access to rural communities; and 2) Lack of didactic-pedagogical resources in these schools.

Chart 4: The Sistema Modular of Tomé-Açu in the target public schools of the research

<table>
<thead>
<tr>
<th>Module</th>
<th>Antonieta Paiva Maciel School</th>
<th>Crescência da Graça Paiva School</th>
<th>Florência Inglis de Paiva School</th>
<th>Santo Antônio II School</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Module</td>
<td>Portuguese Language Science</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Geography</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>Amazonian Studies Field Ed.</td>
<td>Arts Religious Education</td>
<td>English Language Physical Education</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>and Agroecology</td>
<td></td>
<td></td>
<td>History Afro-Brazilian and Indigenous Culture</td>
</tr>
<tr>
<td>2nd Module</td>
<td>Portuguese Language Geography</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>English Language Physical Education</td>
<td>History</td>
<td>Arts</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Afro-Brazilian and Indigenous Culture</td>
<td></td>
<td>History Afro-Brazilian and Indigenous Culture</td>
</tr>
<tr>
<td>3rd module</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Science</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>Arts Religious Education</td>
<td>Amazonian Studies Field Ed. and</td>
<td>History</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agroecology</td>
<td>Afro-Brazilian and Indigenous Culture</td>
<td>History Afro-Brazilian and Indigenous Culture</td>
</tr>
<tr>
<td>4th Module</td>
<td>Portuguese Language Mathematics</td>
<td>Portuguese Language Geography</td>
<td>Portuguese Mathematics Arts</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>History</td>
<td>English Language Physical Education</td>
<td>Religious Education</td>
<td>Portuguese Language Language</td>
</tr>
<tr>
<td></td>
<td>Afro-Brazilian and Indigenous Culture</td>
<td></td>
<td></td>
<td>History Afro-Brazilian and Indigenous Culture</td>
</tr>
</tbody>
</table>

Source: Elaborated by the Authors

The modules are organized to combine the subjects with a complementary workload so that it is also possible to comply with the mandatory annual workload for each curricular component in approximately fifty school days for each module, in each school. Moreover, this distribution of subjects by modules takes into account the number of schools and the workload that each teacher needs, must, and can attend during a week throughout the whole school year, adjusted to the minimum number of weekly classes required for each curricular component. In each of these modules, the weekly class offer is similar to the regular education system. However, in the modular
system, the distribution is calculated according to the mandatory annual workload of each component (Chart 5).

Chart 5: Calendar of classes of the 6th grade of Elementary School at the Antonieta Paiva Maciel School

<table>
<thead>
<tr>
<th>Time</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 7:30 am to 8:10 am</td>
<td>Amazonian Studies</td>
<td>Science</td>
<td>Portuguese Language</td>
<td>Field Ed. and Agroecology</td>
<td>Amazonian Studies</td>
</tr>
<tr>
<td>From 8:10 am to 08:50 am</td>
<td>Amazonian Studies</td>
<td>Science</td>
<td>Portuguese Language</td>
<td>Field Ed. and Agroecology</td>
<td>Amazonian Studies</td>
</tr>
<tr>
<td>From 8:50 am to 09:45 am</td>
<td>Field Ed. and Agroecology</td>
<td>Amazonian Studies</td>
<td>Field Ed. and Agroecology</td>
<td>Portuguese Language</td>
<td>Science</td>
</tr>
<tr>
<td>From 09:45 am to 10:20 am</td>
<td>Field Ed. and Agroecology</td>
<td>Amazonian Studies</td>
<td>Field Ed. and Agroecology</td>
<td>Portuguese Language</td>
<td>Science</td>
</tr>
<tr>
<td>From 10:20 am to 11:00 am</td>
<td>Science</td>
<td>Field Ed. and Agroecology</td>
<td>Science</td>
<td>Amazonian Studies</td>
<td>Portuguese Language</td>
</tr>
<tr>
<td>From 11:00 am to 11:40 am</td>
<td>Science</td>
<td>Field Ed. and Agroecology</td>
<td>Science</td>
<td>Amazonian Studies</td>
<td>Portuguese Language</td>
</tr>
</tbody>
</table>

Source: Elaborated by the Authors

As we show in Chart 4, unlike the other curricular components, Portuguese language composes all four modules that each school receives over a school year, and Mathematics composes two of these four modules, distributed in an interspersed manner with the others. This is possible and necessary because, as we show in Chart 3, previously exposed, the mandatory annual workload of these two curricular components is greater than the other components required by the guidelines and national curricular legislation.

As we show in Chart 4, each module is composed of curriculum components of the Base Nacional Comum and components of the diversified part of the Matriz Curricular. The target module of this research consists of the curricular components: Field Education and Agroecology, Sciences, Portuguese Language, and Amazon Studies. By aggregating components of the diversified part, this module presents an important window of opportunity for a more contextualized educational action with greater flexibility in terms of didactic strategies and priority for specific curricular components.
In SOMEF, linked to the Regime de Alternância and interdisciplinary teaching-learning projects, the student develops educational activities in two stages: Time-School and Time-Community, according to the guidelines present in Art. 10 of Resolution No. 166, of November 20, 2019, of COMED of Tomé-Açu:

SOMEF will be managed by 2 (two) formative periods: Time-School and Time-Community, having to be developed in all subjects of the school curriculum. 1st Paragraph. Time-school is configured in didactic-pedagogical teaching-learning activities carried out in classrooms. § 2. Time-community is the realization of culminations of didactic-pedagogical teaching-learning activities that must be planned and developed in the classroom, with application in several educational spaces that align the theory and material practice (TOMÊ-AÇÚ, 2019, p. 6).

In the Art. 84, Resolution No. 03/2011 of COMED of Tomé-Açu says that:

The field school service in the Municipal Education System of the Municipality of Tomé-Açu (state of Pará), will admit specific strategies and flexibility of the school calendar organization, safeguarding, in the various pedagogical spaces and learning times, the principles of equality policy, observing: § 1 The school year may be structured independently of the calendar year, respecting the provisions of article 7 of this resolution. § 2 The activities contained in the pedagogical proposals of the schools, preserving the purposes of each stage of Basic Education and the type of education provided, may be organized and developed in different pedagogical spaces [...] (TOMÊ-AÇÚ, 2011, p. 20).

As we can see, from the perspective of contextualized and interdisciplinary school education, the SOMEF – as a form of curricular organization – presents itself as a viable possibility for the promotion of school education that respects the specificities of the educational demands of the rural student, as it allows teachers to promote the local culture appreciation and the socio-historical characteristics of their students, as guided by the PCN (BRASIL, 1998; 1999), the DCN (BRASIL, 2013), the BNCC (BRASIL, 2017), and the LDB itself in force.

Thus, in seeking to promote quality education for the countryside, the teacher, as a mediator of the teaching-learning process, can propose alternatives to improve their methodologies, facilitating the contact between the student and the contents of the curriculum in the field itself (BRASIL, 2013), from the perspective of not only approximating the curriculum and/or the methodologies already used and known in urban education for the rural environment, but developing or recreating strategies for the field education, establishing connections between the official curriculum of the formal school system and the life of the rural people (BRASIL, 2013).
The Sistema Modular adopts the projects’ methodology because it understands the need for contextualization of teaching-learning. According to Santos, Royer, and Demizu (2017), this methodology, which emerged in the early twentieth century with John Dewey (1859-1952), was disseminated in Brazil around the 1930s from the Escola Nova movement, mainly through Anísio Teixeira (1990-1971) and Lourenço Filho (1897-1970). It can be a strategy of an efficient curricular organization, as it allows intertwining popular knowledge with scientific knowledge, providing the four pillars of education: learning to know, learning to do, learning to be, and learning to live together.

According to CNE/CP Opinion N. 22/2020, which deals with the Diretrizes Curriculares para a Pedagogia da Alternância na Educação Básica, this regime of training-times alternation may allow articulating knowledge without fragmenting it. “Through it, experience and social practice are seen as fundamentals for the training program. In it, science is seen as an instrument of interpretation and intervention in reality, aiming at its transformation” (BRASIL, 2020, p. 11). Thus, this regime seeks to stimulate the practice of research by instigating students to know and recognize the natural and sociocultural environment in which they are inserted, through the scientific knowledge that is or will be applied or systematized with the educational action promoted by the school.

Also, according to this Opinion, the mission of Pedagogia da Alternância na Educação Básica is “to enable students to access scientific and technological knowledge as knowledge built from the problematization of reality” (BRASIL, 2020, p. 12), since it proposes that, through the exchange of experiences, knowledge be built for human formation and rural development.

To reconcile scientific knowledge to solve issues experienced in rural communities in each region where schools are located, we started organizing and planning the interdisciplinary teaching project together with teachers and pedagogical coordination, seeking to meet the needs and peculiarities found in each location, as provided for in Resolução Municipal N. 3/2011. Art. 78 states that:

[...] the modality of school education, offered to the rural population, in its various forms of life production – family farmers, extractivists, artisanal fishermen, riverside dwellers, settlers and camps of agrarian reform, quilombolas\(^3\), caçarás\(^4\), indigenous and others – in the Municipal Education System of the Municipality of Tomé-Açu (state of Pará) should be promoted

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\(^3\) Inhabitant of communities formed mostly by remnants of fugitives from slavery.  
\(^4\) Native or inhabitant of the coast.
through the implementation of the necessary adjustments for its adaptation to the peculiarities of rural life and each community, especially: I. Curriculum contents and methodologies appropriate to the real needs and interests of students in rural areas; II. Own school organization, including an adaptation of the school calendar to the stages of the agricultural cycle and climatic conditions; III. Adequacy to the nature of work in rural areas (TOMÉ-AÇU, 2011, p. 19).

From the time-school arrangement, it is possible, throughout the work, to listen and plan the activities suggested by the students for the time-community, since § 3 of Art. 10 of Municipal Resolution N. 166/2019 says that:

The following are considered the culmination of time-community: I. Field classes, with technical visits in formative and non-formal spaces; II. Classes directed in different environments that provide interdisciplinarity between areas of knowledge and combine theory with educational practice; III. Thematic seminars, meetings, courses, lectures, etc., held or not by students for the local community or differentiated public; IV. Experiments, fair-pedagogical, or construction of products with practical applicability. V. Educational exchange with other units that follow SOMEF, or have experiences that assist in understanding the related contents of the teaching modules and disciplines; VI. Other activities not intended to assist and understand the contents applied in school time (TOMÉ-AÇU, 2019, p. 6).

Given the possibilities that SOMEF offers, it is possible for teachers to reflect and plan their own functional methodologies for teaching-learning in Field Education because, as an educational public policy with its own identity, it seeks to correct/repair misconceptions that rural peoples previously had to experience. It is a policy to promote adjustments in the offer of Field Education to make it accessible and adequate to meet the field people’s educational learning rights, unlike rural education, which adopts a hegemonic model of countryside and city based on a Eurocentric conception of colonialism (LIMA and MELO, 2016; SILVA and LOPES, 2020).

Within the curricular organization arrangement of SOMEF, along with the concepts of school teaching-learning inherent to the Regime de Alternância, in the field schools of the Tomé-Açu, the practice of activities inside and outside school spaces is already a reality, in addition to visits to agricultural properties and agriculture and livestock research in the municipality, among other educational actions.

3.2 Teaching experiences in this Sistema Modular de Ensino

Based on the national and municipal educational regulations of the Tomé-Açu Field Education, the teachers of the module consisting of the curricular components “Sciences,” “Amazon Studies,” and “Field Education and Agroecology” developed the
interdisciplinary project “Ensino de Ciências e Agricultura Familiar [Teaching of Sciences and Family Agriculture]” aiming at the contextualization of the school curriculum to the daily life of the field communities, seeking to value these people’s identity, in their ways of being and living in the context: work, education, cultural, economic, political, and socio-environmental profile, for example. Thus, this project involved a total of 227 students from the 6th to the 9th grade of Elementary School from four schools and was developed in a sequence, as shown in Chart 6:

Chart 6: Execution sequence of the Ensino de Ciências e Agricultura Familiar project

<table>
<thead>
<tr>
<th>Sequence</th>
<th>School</th>
<th>Period</th>
<th>N. of students</th>
<th>School Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st School</td>
<td>Antoneta Paiva Maciel</td>
<td>03/11/2019 to 05/03/2019</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td>2nd School</td>
<td>Florência Inglis de Paiva</td>
<td>05/06/2019 to 06/28/2019</td>
<td>68</td>
<td>40</td>
</tr>
<tr>
<td>3rd School</td>
<td>Crescêncio da Graça Paiva</td>
<td>08/05/2019 to 10/11/2019</td>
<td>39</td>
<td>50</td>
</tr>
<tr>
<td>4th School</td>
<td>Santo Antonio II</td>
<td>10/14/2019 to 12/19/2019</td>
<td>69</td>
<td>54</td>
</tr>
</tbody>
</table>

Source: Elaborated by the Authors

This project was designed according to the municipal teaching plan, and the teachers had the autonomy to decide with their students on the sub-themes of study and the didactic instruments and strategies that would be adopted, as explained by the excerpts from the speeches of the teachers — Field Education Teacher (FET) and the Science Teacher (ST) — participants of the research, when asked to express their opinions about the teacher autonomy they had in the planning of the project in each school:

*The only instruction from the department of education was the listing of content that should be worked on (FET).*

*When we started planning the project, we looked at the teaching plan, so it did not deviate from the student’s needs in relation to school content (ST).*

This autonomy given to the teachers allowed the planning to be carried out by school unit, since each school has its own identity, as the following excerpts show:

*The planning took place from the beginning of the module, with proposals for dates and possible topics. The contents worked would have to be linked to the project proposal (FET).*

*The teachers got together and gave their opinion on how it would be done in the classroom (ST).*

With this freedom of planning, in each school, the project gained its own identity, with the general objective of valuing the field cultural identity, starting from the
generating theme “Family Agriculture”, since this theme represents much more than an economic activity: it has intrinsic representativeness in the socio-historical and cultural processes in the field territories.

In addition to focusing on local identity, the planning ensured that the teaching plan did not escape the educational needs of students regarding classical school contents, aiming at the development of the indispensable knowledge, skills, and competencies for the student to understand and relate to the local and global world, as directed by the BNCC (BRASIL, 2017). Thus, we sought to develop skills for students to systematize school knowledge while developing a scientific view of the world around them and the perception of their sociocultural identity.

As Arroyo (2019) argues, by involving the student in educational situations that help them perceive and understand their identity, the teacher will contribute to a more contextualized and useful teaching for the individuals. By perceiving themselves and others, they will be able to act more deliberately on the changes and choices they intend for their lives. From this perspective, the project was organized with a common general objective for the four schools and a flexible methodological design, according to the specificities of each of them, according to the period (see Chart 6) to carry out the activities in the school-time and in the community-time.

In the execution process, in some schools, the time-community occurred simultaneously with the time-school due to problems that arose in the first half of the 2019 school year. One of them concerns the suspension of classes during the heavy rains in the region, which caused the Acara Mirim River to overflow, inundating the area from March to May 2019. As a result, in the surrounding areas, including rural and urban communities, many inhabitants were isolated, and some of them were homeless.

Consequently, the execution of the project underwent replanning to include educational investigations on the natural phenomena and the human interferences that lead to and/or contribute to human life disorders — as is the case of floods — as indicated by the BNCC, with the following suggestion of skill to be worked/developed by the curriculum component of Sciences:

Evaluate how the impacts caused by natural disasters or changes in the physical, biological or social components of an ecosystem affect their populations, which may threaten or cause the extinction of species, change of habits, migration, etc. (BRASIL, 2017, p. 347).
Discuss initiatives that contribute to re-establishing the environmental balance from the identification of regional and global climate changes caused by human intervention (BRASIL, 2017, p. 349).

These investigations involved students and other community members, who studied the damage caused by the floods and reparation strategies. For this, the students visited the properties affected by the floods (Figure 1) and opened seminars to the general public (students and community), presenting video documentaries and oral and artistic presentations, as Figure 2 shows.

![Figure 1: Visit local properties](Source: Authorship Collection)

![Figure 2: Seminar open to the local community](Source: Authorship Collection)

Concerning the activities developed in the time-community, the students also explored (Figures 3 and 4) the properties outside the local communities, where they could hear and see the technical procedures and studies carried out within the municipality to improve agricultural production from agroecological strategies. In this activity, the following skill of the curriculum component of Sciences, suggested by the BNCC, was worked on: “compare different reproductive processes in plants and animals in relation to adaptive and evolutionary mechanisms” (BRASIL, 2017, p. 349).

![Figure 3: Passion fruit plantation](Source: Authorship Collection)

![Figure 4: Preparation of cassava for the handmade manufacture of flour](Source: Authorship Collection)

One of the estates where the field class took place is a reference in the development of the Agroforestry Systems (AFS) of Tomé-Açu. These systems “are considered excellent alternatives for the use of resources that increase productivity, providing a higher level of sustainability due to the increase in biodiversity in the production system” (KONAGANO et al. 2016, p. 2).
After the field classes, the students returned to the time-school to systematize the experiences acquired during the time-community and the scientific concepts worked, and then define a form of sharing the knowledge with the school community.

With the interdisciplinary perspective of the project, several strategies were used according to the needs and choices of the teachers in partnership with the students. In this regard, the teachers used the following resources, strategies, and activities: visits to the different non-school spaces around the school; photographic record; conversation circle; production of models; debate; seminar; exhibition; dramatization; Science fair, among others.

According to the teachers that participated in this research, varying the resources and didactic-methodological strategies enabled a better involvement of the students in the educational actions, as shown in the following excerpts from their statements:

Conversations for the exchange of ideas between students was an efficient strategy because it gave the students the sense of freedom to choose the way they felt more like exposing what they had acquired, in a simple conversation (FET).

In group activities, the students participate better (ST).

Always seeking to adapt the strategies to the intended objectives, and prioritizing the protagonist participation of the student, in its interdisciplinary format, the project managed to contemplate the study of classical curricular contents, as reported by the teachers:

In the class for which I was responsible, the biogeochemical cycles were worked on (ST).

The discipline taught is already based on subjects related to the field, so all the contents in all the years were contemplated with the project (FET).

With this look at what would be the most appropriate strategies, the project was able to involve students in different contextualized educational actions. For example, the productions of the students of the 6th grade highlighted the problems related to water pollution, so the presentations of these productions were made through models that represented the situation of local rivers and streams, the health problems resulting from polluted water, the forms of water treatment and medicinal herbs they use in their homes, which can be employed to treat possible diseases acquired due to the use of water unfit for human consumption, as shown in Figures 5 and 6.
Figure 7 shows the activities developed by 7th graders, focusing on sustainable agricultural production, incorporating the concepts of renewable and non-renewable resources, and demonstrating the conscious and responsible use to develop agricultural production.

The 8th grade students highlighted the most developed economic activities in the community that involve concepts of soil chemistry, organic fertilization, cultivation techniques, and animal husbandry. In Figures 8 and 9, one of the groups demonstrates how to reduce the odor of pig droppings raised indoors. This technique is developed in one of the properties visited outside the limits of the school community, and was reproduced by the students to demonstrate the possibility of adoption in their communities.

The technique consists of lining the corral floor with a compound formed by sawdust, ground coal, and forest land. After a few months, the black ground that forms can be used as organic fertilizer. Through the discussion of the artisanal technique, chemical and biological concepts of the following contents were addressed: decomposing beings; chemical reactions; and difference between organic and inorganic fertilizer.

According to Figures 10, 11, and 12, the 9th grade students developed demonstrative activities on biogeochemical cycles, using the representation of the elements of the landscape of the field territory: the landscape of their daily lives.
The activities developed by the students were carried out in groups, and when the teaching strategies prioritize the student’s protagonism in group work, the difficulties to evaluate tend to increase, as discussed by Luckesi (2018).

Then, in this project, different evaluation strategies and instruments were used, including the semi-structured script to monitor how much and how each student was involved in each activity. In addition, the students also answered questions in an individual test format. In each of these strategies, both positive and negative aspects were observed, as shown in the following excerpts on how the evaluation process occurred:

Through the active participation that goes from the organization of the material that will be used, the application in the research, the assembly of the works, and the exhibition (FET). It was very productive, since the students observed the purpose of the project (ST).

In relation to the group work that included conversation circles, debates, and seminars, the teachers differed a little regarding their efficiency:

[...] the group work presented to the class gave the idea that they had to memorize something and present; therefore, many students ended up blocked (FET). The group work was much more efficient and accepted by the students, because everyone felt more comfortable to carry out the activities (ST).

According to the observations made, we realize that these points of doubt about the efficiency of group work may be acceptable because, as discussed by Tenenbaum (2011), a strategy can be well accepted by a class of students in one curricular component and not be, by these same students, in another. However, this does not necessarily mean the presence of a problem, since there are infinite variables that interfere in the school teaching-learning process.

According to each student’s preferred learning styles, the same teaching
methodology can be great for some and terrible for others (...) if the teacher uses a methodology that privileges a certain learning style, students who are not comfortable with this skill will find it difficult to learn or will tend to be disinterested in the class (TENENBAUM, 2011. p. 3).

Regarding satisfaction with the results obtained, the teachers stated that:

*The goal sought was achieved, with students learning and applying what was learned (FET).*  
[...] *each student involved in the project learned about what teachers taught and gave an excellent presentation to the local community (ST).*

Regarding the positive aspects of the project, the teachers stated:

*Students’ learning about the reality they are inserted in. Everyone there is involved in the context of the field, however, many aspects that are characteristic of the rural environment went unnoticed by them, and the project helped them to visualize these characteristics (FET).*  
*Good team, students and community learned what family farming really is, no matter how much they lived with it (ST).*

In the teachers’ speeches, it is clear that the proposed activities did not have an end in themselves; they had the potential to be not just fulfillment of the school curriculum and school year. They made it possible to systematize knowledge that is useful to the daily life of the community, and it is at this point that we perceive the possibilities of contextualization as a guiding principle of all the action of this curricular organization format: SOMEF linked to the Regime de Alternância and teaching strategies through interdisciplinary projects.

From the perspective of discussing contributions from the study of the environment to the initial education of field educators for Science Teaching in the semi-arid region of Piauí, Silva and Lopes (2020) also advocate the use of a teaching-learning project as a valuable and efficient strategy in rural education schools. However, according to these authors, this strategy is still little practiced, probably due to the initial teacher education that is still based on the traditional curricular organization. However, according to these authors, the implementation of this strategy in the teaching of these schools can both contribute to the actions of contextualization of the curriculum and the training of teachers who always need to use teaching methods coherent with the educational needs of the environment in which they are inserted as teachers and qualified educators.

Finally, it is worth noting that with this curricular organization, we noticed that it was possible to work directly for the development of the following general skills
suggested by the BNCC for Basic Education:

Valuing the diversity of knowledge and cultural experiences and appropriating knowledge and experiences that allow the student to understand the relationships of the world of work and make choices aligned with the exercise of citizenship and his life project, with freedom, autonomy, critical awareness, and responsibility.

Argue based on facts, data, and reliable information to formulate, negotiate and defend ideas, points of view, and common decisions that respect and promote human rights, socio-environmental awareness, and responsible consumption at the local, regional, and global levels, with an ethical position in relation to the care of oneself, others and the planet (BRASIL, 2017 p. 9).

4 Final considerations

By seeking to know whether by offering school education through the Sistema Organizacional Modular, Regime de Alternância, and development of teaching-learning projects, the Field Schools of the municipality of Tomé-Açu (State of Pará) can promote educational actions that meet educational regulations and, at the same time, are coherent with the educational needs and identity of the field student, the research was concluded considering that the answer to this question is affirmative. However, given the objective and methodological design, the research was concluded considering that the biggest obstacle to this curricular organization concerns the duration of the modules, which limits the realization of some teaching-learning strategies that require more than 50 days.

On the other hand, the research also concluded that involving students in study situations that associate elements of their context can be a didactic-methodological strategy that enables students’ more significant and better role in school activities that, in their greater objective, should contemplate the classical school contents in a contextualized way and, therefore, useful and meaningful for these students, thus contributing to their (trans)formation.

Finally, here it is worth highlighting that with this curricular organization, young field people can study with teachers trained in specific areas of knowledge, participate in interdisciplinary projects developed with the help of these teachers, and learn the classical school contents in a contextualized way without having to travel for long distances to the city, which obviously makes school study a tiring task, something that, undoubtedly, is a motivating factor for school dropout. This is a major challenge for school education in the geographic region of the country in which this research was developed.
References


