RURAL EXTENSION FOR DIGITAL COMMUNICATION ENVIRONMENTS

Pedagogical methodology and practical applications

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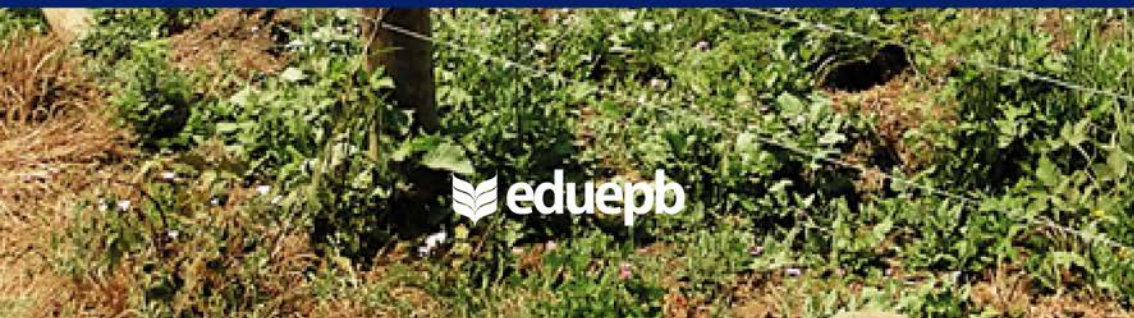

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LIST OF SHORTENED FORMS *

ATER	Technical Assistance and Rural Extension
EaD	Distance Learning
ECDER	Networked Digital Education Ecosystem
EDAP	Group of Pedagogical Actions Development
EDR	Network of Digital Education
FAO	Food and Agriculture Organization for United Nations
MAPA	Ministry of Agriculture, Livestock and Supply
SDG	Sustainable Development Goals of the United Nations
UN	United Nations
PNATER	National Policy for Rural Technical Assistance and Extension
TIC	Information and Communication Technologies

* **Translation note: all forms were kept in their original language, but their descriptions were brought in a version in English. The translations of the figures are offered to the reader in the annexes.**

CONTENTS

PRESENTATION

Dialogic communication paths connecting people who live and work in rural territories engaged on agriculture production is one of the main fundaments of Technical Assistance and Rural Extension (ATER). This educational approach plays an important role in transforming realities that goes far beyond the transmission of content but impacting different aspects of people's lives.

The United Nations Organization (UN) proposed an initiative for social equity, environmental and socioeconomic sustainability, through the establishment of 17 Sustainable Development Goals[1]. These objectives provide us with a matrix to understand not only the role of education, food production, water quality, but a whole relationship of interdependence of all the elements discussed, as it can be seen in Figure 1.

1 (2021) UN.

FIGURE 1 – Sustainable Development Goals of the United Nations
Source: UN (2021)

In order to achieve these goals, UN structured an approach called One Health, that works systemically in human, animal (here also including the quality of food products with this origin) and environmental health. Food and Agriculture Organization of the United Nations (FAO) defines One Health in the countryside as a set of unifying actions that aims at the constituent elements of the sustainability of biomes, people, and agricultural production. It promotes the work with:

> (…) food security, sustainable agriculture, food safety, antimicrobial resistance (AMR), nutrition, animal and plant health, fisheries, and livelihoods. Ensuring a One Health approach is essential for progress to anticipate, prevent, detect, and control diseases that spread between animals and humans, tackle AMR, ensure food safety, prevent environment-related human and animal health threats, as well as combatting many other challenges.[2]

2 (2021) UN-FAO.

In this perspective, we present an educational methodology aimed at a participatory Digital ATER in One Health, Sustainability and Social Equity, with examples and availability of educational resources. When the three main elements of One Health (man, biomes, and agricultural production) are expanded and deployed, they can be categorized into four major areas. They determine the sanitary quality of countryside standards: location, economy, interactions, and social behaviors. When collating One Health approach and the agricultural production, it is possible to have a clearer view in the processes of understanding, planning, development and implementing actions that constantly aim at sanitary control and prevention in the countryside[3]. This book helps in the planning, development, and application of various pedagogical contents via digital teaching-learning ecosystems in the countryside territories, in this new productive reality.

It is important to emphasize that the services and products that will be developed and offered in the countryside by Digital ATER are not limited to mere technological support for "Agriculture 4.0", which is currently emerging in agricultural production processes. Looking at Digital ATER in this way is to reduce it to a mere support tool, which is not the case. In this book, Digital ATER, with a dialogic and participative bias, offers to the technical educator an opportunity to practice reliable postures and responsibilities. And to the environments, adequation where people who live in the countryside teach and learn the most varied types of content in life.

Paulo Freire[4] in dialogues with Sérgio Guimarães already observed, in the 1980s that the use of electronic media for dialogical teaching-learning processes could not be taken as

3 (2020) Trilla.

4 (2021) Freire; Guimarães.

a barrier, and we could not label them as good or bad. The pedagogical decisions taken during the activities with the students will determine the act of teaching. He saw in the media a potential for expanding the cognitive horizons of students. So, diversity present in life is important to the diversity of educational materials and, in some cases, an electronic media can be more interesting. However, electronic media in Education should not have the role of just delivering something done, they must offer space for dialogic communication, recognizing in the interlocutor the various possibilities of teaching and learning.

Throughout the book, we will present four sets of examples for the application of this participatory Digital ATER, involving the following scenarios: i) prevention of Covid-19 in the countryside and slaughterhouses; ii) good practices in the use of veterinary products in animal production; iii) prevention of the *Fusarium* 4 Tropical Race fungus in bananas and iv) basic elements of Rights and Citizenship for people living in the countryside; v) introduction of the various types of credit and indebtedness. Such experiences were systematized in a set of 12 books[5] for free distribution, as well as the respective educational resources, generating a series called "Dialogues in the countryside". It is based on this experience and references that we present the fundamentals of a participatory Digital ATER based on the UN Sustainable Development Goals.

All books had multidisciplinary teams[6] composed of 68 people, including teachers, researchers, public employee, and communication professionals. All belonging to the following areas of knowledge: health, rural extension, health inspection,

5 (2020abcd) Zuin *et al.*; (2020abc) Zanella *et al.*; (2021) Sousa *et al.*; (2021) Trentini *et al.*; (2021ab) BRASIL-MAPA; (2021) Ribeiro *et al.*

6 The list of the books authors and their respective organizations follows in the attachment.

pedagogy, journalism, and graphic design. These people were mobilized to provide a short-term response aimed at health education in the countryside. They represent 19 national and international organizations, such as universities, research centers and health inspection bodies.

From the mentioned 12 books, all of them were part of two university extension projects approved by the Culture and Extension Commission (CCEx) of the Faculty of Animal Science and Food Engineering (FZEA-USP, except the first one (Operational technical manual: biosafety procedures for Covid-19 in meetings and production routines between technician-educators and rural swine producers). These extension projects are entitled "Development of actions to protect rural producers, agribusiness workers and their families in response to the Covid-19 pandemic" and "Dialogues in virtual communication environments for sustainable socioeconomic, technological, managerial and environmental development of rural sectors of Latin America".

Enjoy the paths, forms and examples presented of a pedagogical methodology for a participatory Digital ATER.

PREFACES

The Food and Agriculture Organization (FAO) of the United Nations included in its 2022-2031 strategic framework four major aspirations for the transformation of more efficient, more resilient, more sustainable, and more inclusive agri-food systems, driving better production, nutrition, environment, and a better life, without leaving anyone behind. These four improvements represent an organizing principle in relation to the way FAO is working to support the implementation of the Sustainable Development Goals (SDGs) of 2030 Agenda and to foster the adoption of a strategic approach oriented towards production and consumption systems.

Knowledge plays a fundamental role for sustainable rural development. The contribution of this publication, organized by the authors, stands out for the quality of the content and its usefulness at this specific time when countries face major challenges because of the Covid-19 pandemic. The material offers information and methodological tools to be used by different rural agents on topics related to Participatory Technical Assistance and Rural Extension (ATER, in Portuguese) for health, law and citizenship in the countryside. Through concrete examples, methods and didactic guidelines, the authors offer a complete collection for rural extension with farming families.

In this publication, focused on "Dialogues in the countryside", it is possible to access comprehensive information about participatory Digital ATER, make use of operational technical manuals, download complete books, audio recorded in Portuguese and Spanish that present the contents in the form of dialogues. In addition, readers will be able to access illustrative infographics and guidelines to disseminate information via WhatsApp/Telegram. Eventually, we are pleased to have more than a complete material for technical assistance and rural extension of quality and innovative in terms of digital tools.

I encourage all readers to enjoy most of the materials possible and use them in their activities as extensionists and development agents, expanding their contribution to sustainable rural development and achieving the SDGs. I congratulate the organizers and authors of this publication, which undoubtedly represents a great contribution to Latin American countries.

Good reading!

September 3, 2021.

Adriana Calderan Gregolin

FAO Regional Coordinator of the Project "+Cotton" (FAO-ABC/MRE)

FAO Regional Office for Latin America and Caribbean (FAORLC)

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It is with great joy I share with you the opportunity to preface this book. Authors used a clear language supported by a critical and robust conceptual structure, bringing relevant ponderations, guidelines, proposals, behavioral guidelines, and experiences to propose the Digital ATER methodology. Its relevance achieves the important work of the Technical Assistance and Rural Extension (ATER) services.

The publication of this book takes place at a unique moment in the history of our society in which the impacts of the pandemics resulting from COVID-19 have marked our lives and those of our families, social, professional, and economic and all our other relationships with the world. However, communication processes supported by new digital technologies were enhanced, allowing and expanding the forms of interaction between people and institutions, whose effects will be extended into the future, influencing production dynamics, including agricultural activities.

Aware of this situation and for the time to come, the authors based their texts on extensive knowledge and experiences in teaching. Rural extension activities were careful and assertive in conducting this work with the purpose of presenting Digital ATER, not focusing only on digital technologies, but also on the use of these as levers so that Dialogs in the Countryside could take place in a fruitful and participatory role among all actors.

I invite you to know all its chapters whose organization allows a structured understanding of Digital ATER as a methodological path to promote the concept of one health, law, and citizenship through better communication. The sequencing of the chapters will allow us to understand the context of rural territories in which Digital ATER presents itself as the structuring and pedagogical foundation. Methodology is centered, important considerations on interactions with educators and students

are brought, experiences and pragmatic methods may be used as guidelines, as well as new propositions for the quality of communication of people who live and work in the unique conditions of rural environments.

Good reading!

September 2, 2021

David Ferreira Lopes Santos

Prof. PhD at Universidade Estadual Paulista - Unesp

INTRODUCTION

Since 2010, Technical Assistance and Rural Extension (ATER) services have been governed by the Brazilian National Policy for Technical Assistance and Rural Extension (PNATER) by Law 12.188/2010[7]. In that document, ATER was planned as a continuous education service[8] in non-formal teaching environments, aimed at family farming and other agents in the countryside (such as agro-extractive, forestry, and artisanal activities). Spaces for dialogue would be opened to these people, aimed at bringing them closer to their statements, their social technologies[9], their networks of association and cooperation. Thus, the objective was to establish a learning process constituted by pedagogical mechanisms contextualized for countryside, such as those employed by state public agencies for rural extension.

Ten years later, the Federal Government launched the Digital ATER program by the Ministry of Agriculture, Livestock

7 (2010) Brasil.

8 The word "Education" used in this book refers to any pedagogical share among people that live and work in the countryside.

9 For Rodrigue and Barbieri (2008, p. 1071), the concept of social technology "comprises replicable products, techniques or methodologies, developed in the interaction with the community, and that represent effective solutions for social transformation". Author's translation.

and Supply (MAPA)[10]. Its presentation was justified by the low indicators of the ATER service "in the traditional molds", where only 20.1% of Brazilian rural establishments received in-person technical guidance from a rural extensionist[11]. Then, this organization discussed the importance of inserting Information and Communication Technologies (ICTs) into production routines, arguing that this initiative would expand the reach and access of innovative, fast, and efficient services for rural producers. From the regulation to the practice of Digital ATER, intense discussions erupted in private and governmental organizations of ATER, passing through universities and research centers. Some questions raised by institutions were: what would be the model for Digital ATER? Is this a diffusionist or dialogical model? What voices and positions would be presented in its development and application in the countryside?

Historically, it has been expected that the ATER extensionist would go to the rural producer in person, to understand and offer technological and social knowledge for the development of their productive processes and life. Digital ATER's focus in 2020 was to bring ICTs into the countryside. At first, the questions related to interactions in rural territories were: based on scientific knowledge, acquired through digital technology, how would the technician contribute for modifying the historically constituted rural know-how of the location in which he works? Then, the next concern was: which communicative paths and structures would be suitable for the interaction between technician-educator and rural producer, with a view of bringing knowledge and innovation through digital resources? And yet: how much of the rural space had signs of digitization in its technological

10 (2020) Brasil, MAPA.
11 (2017) IBGE.

know-how, contrasting and complementing with the knowledge brought by the technician-educator?

When considering what would be the definition of the nature of Digital ATER that would be constituted in Brazil, it coincided with the health crisis in the country of the Covid-19 pandemic. In this sad historic moment, the contact between the technician-educator and the farmer became even more complex and uncertain, due to the measures of social distancing recommended by the health agencies. This new interactional context demanded alternatives for dialogues via the web in the rural areas, creating innovations in connections and languages with the rural producer in this interactional environment, which in turn was challenging, since none of them was totally used to this new communicative scenario.

Then, the redefinition of relations for all those involved in the productive systems in the countryside was gradually built. Through the performance of public and private ATER bodies, the objective of creating new communication spaces via digital environments was consolidated and expanded. The challenge for the technician-educators was to review how the complementary knowledge coming from science through ICTs would blend with the historically constituted know-how of farmers in the countryside. For this, the intention of taking digital technology to areas never contemplated before would be implemented. All subjects involved in rural production, such as technician-educators, rural producers, financial promoters, universities, research centers and many other agents that were related to the conduct of Digital ATER, needed to review what they understood as a tool, communication, expressiveness, and identity. In this moment of pandemics, the transformation in the countryside through ICTs aimed to produce agricultural production at the expected levels to ensure food and nutritional security for people in cities.

At first, there was no direct guidance from public agencies of Rural Extension on how the systematized pedagogical methodology of Digital ATER would happen in times of pandemics. However, organizations suggested actions to be focused on communication applications on mobile devices present in the countryside. The most urgent and feasible paths were defined, leading to the adoption of pedagogical practices aimed at the use of cellular phones and instant messaging applications. Through tests, validations, progress, and in experiments, the challenge of Digital ATER for knowledge propagators and modifiers – here, the order between technician-educator and producer is not very relevant – would be to maintain the dialogical bases in their essence.

Here, dialogism is conceived as the process of expanding the elements of interactions between people beyond the mere utterance of words, speech, or text expressions. This equipotent environment occurs in the transformation of the exchange bases of senses and meanings through communication, involving the visible and the invisible, the perceptible and what has not yet been meaning and even not conceived by the interlocutors[12]. In this perspective, the experiences narrated in the book series "Dialogues in the countryside" aim to be an initiative – and a practical application – to the paths of the dialogic act involving the educator and the learner in the interactive environment of participatory Digital ATER.

This extension model is a method of continuing education directed the countryside, which was important for rethinking pedagogical strategies, in accordance with a Bakhtinian[13] and Freirian[14] dialogical practice. These practices are present in

12 (2010, 2006, 2003) Bakhtin; (2014, 1997) Freire.
13 (2010, 2006, 2003) Bakhtin.
14 (2014, 1977) Freire.

non-formal teaching environments and focused on farmers' know-how. Its theoretical foundations were the motivation to generate initiatives to help with actions consistent with rural life. This program was conceived in the academic space, but it came together with a greater number of institutions to bring representation and to unite the university with the countryside – a movement as cyclical of discursive construct and as the essence of the dialogical act itself.

The pedagogical strategies of the participative Digital ATER methodology advocate various diagnoses and analyzes through horizontal relationships, without the constitution of a know-how hierarchy. Bidirectional, from the very beginning, the participative Digital ATER proposals evaded a monologic didactic environment, the flow of knowledge in only one direction and the emphasis in the use of ICTs rather than in the process of human interactions. So, the premise is based on the principle of valuing the two poles of views and positions in life, of the rural producer and technician-educator[15].

Participatory Digital ATER presents the concepts of dialogic communication, so that the pedagogical relationships in the development of agricultural production are significant. In an admittedly dialogic methodology, the perspective of listening and the right to speak, in Paulo Freire, emerges as an important direction for a participatory Digital ATER. The author reports the dialogic communication as follows:

> In the process of speaking and listening, the discipline of silence, which needs to be developed with serious intent by subjects who speak and listen, is a *sine qua non* of dialogical communication. The person who knows how

15 (2022) Zuin.

> to listen demonstrates this, in obvious fashion, by being able to control the urge to speak (which is a right), as well as his or her personal preference (something worthy of respect). Whoever has something worth saying has also the right and the duty to say it. Conversely, it is also obvious that those who have something to say should know that they are not the only ones with ideas and opinions that need to be expressed[16].

The acts of speaking and listening, from this perspective of dialogical theoretical basis, circulate between law and commitment, not as opposites, but as complementary. From the exercise of movement between both acts, the subject can define their priorities in life. In Digital ATER, the issue would be to understand how its educational process would take place in this interactional environment, being non-formal in nature and scientific by responsible actions of the technician-educator. Therefore, would the pedagogical activities developed for this environment be significant for the student? Technician-educators and rural producers, representatives of academia and other organizations would interrelate around the common objective of exchanging experiences and experiences also through Digital ATER. Know-how coming from the countryside environment would not be treated through the eyes of technicist science, or through its experiments. This would presuppose a distance between the objective (rural production) and the object (people who live and work in the countryside). So, the main purpose of the work would be to bring what is more humanist in each group activity of those who live and work in the countryside, as well as their experience and the relevance in each aspect of the

16 Freire (2001, p. 105 - Trad. CLARKE, P.)

technological knowledge of science. Larrosa[17] discusses it better when brings that:

> Defining the subject of experience as a passionate subject does not mean thinking of this person as incapable of knowledge, commitment, or action. Experience also founds an epistemological and an ethical order. The passionate subject also has its own strength, and this strength is productively expressed in the form of knowledge and in the form of praxis. What happens is that it is a question of knowledge distinct from scientific knowledge and knowledge of information, and a praxis distinct from that of technique and work.

Here, the humanization of the teaching-learning process is expanded through technological resources: the agents are human, but also their praxis, their demarcation of territories and their responsibility towards the environment. Zuin and Zuin[18], discussing extension in rural areas, state that:

> (...) more and more, rural extensionists have been required to adopt a posture that respects both natural resources and the subjects that belong to rural territories. Today, the search for a dialogic posture and the related subjects at their work routines seem to be urgent.

This panorama could be described through practices between concrete actions and abstractions that are coherent with the driving forces of the dialogic process of teaching and

17 (2002, p.26) Larrosa - Author's translation.
18 (2014, p.14) Zuin; Zuin - Author's translation.

learning, such as: knowing the dynamics of the interlocutor's life; identifying the elements present in the unique teaching event, which is unrepeatable; and rural production or the people who make up a particular rural territory. It also allows us to understand the potential construction joint of a new, fairer, and more solidary reality. And yet, to be aware of the existence of an uninterrupted movement, of a continuous coming to be, of the unfinished interactive business that led the interlocutors to choose the positions they will take. In an even more dense setting in dialogic, interactionist, and horizontal reflection, a place of decision-making is conceived here, in which only one does not occupy the place of another, especially in decision-making moments, occurring in an act of cultural invasion[19]. The result of this process is a subject who knows how to negotiate. Thus, responsibility and consequences on the environment are more under control in the environment built. The meaning of life would be found in the claim for the right to the achievements arising from responsiveness in interactions. The subject is constituted by the perceived world and with the world proposed in which there may welcome external contributions[20].

In the following chapters, the 12 books and teaching materials developed with this new method of communication for digital interactional environments will be a theoretical and practical of this discussion background. It is assumed that both technician-educator will be affected by the same factors of instability and uncertainty regarding the present and future of Digital ATER. The emergence of new relationships during the pandemics in the rural space brought elements that redefined the subjects, their actions, the means of interaction, educational

19 (1987) Freire.
20 (2010b) Bakhtin.

contexts, and forms of communication in each time-space. New interactional forms were created, that is, networked digital ecosystems for teaching-learning in rural territories.

CHAPTER 1 - DIGITAL NETWORKED ECOSYSTEMS FOR EDUCATIONAL PROCESSES IN RURAL TERRITORIES

According to CETIC, most people who work and live in the countryside interact in virtual communication environments through their cell phones (80%) and have access to the web in their rural homes (65%)[21]. They communicate mainly through the instant messaging application WhatsApp (96%) and the social network Facebook (67%)[22]. Farmers and technicians interact in this context through ATER services. Regardless of each environment, interactions are meant to take place meaningfully to the farmer and his family, aiming at the improvement of productive activities and rural life, with sustainability and social justice. It is important to consider that, although there may be some similarity in some respects, this ATER should not be a simple transposition of the teaching-learning methodologies of face-to-face activities to digital. It presents many possibilities for pedagogical and dialogical actions between technician-educators and people who live and work in the countryside.

21 (2020) CETIC.
22 (2017) ABMRA.

At this historical moment, we are experiencing an acceleration of interactions towards virtual communication environments, something that had already been intensified before the emergence of the Covid-19 pandemic, through the formation of a network society. In the Educational relationships, formal or informal, changed with the addition of virtual communication spaces, an evident transformation happened all over the world. In contemporary society, interactions in the digital teaching environments changed into a hybrid way, with face-to-face and remote meetings, in synchronous and asynchronous times, consolidating a Network of Digital Education (EDR)[23].

In 2021, part of the pedagogical interactions that constitute the EDR in the countryside offered contents and information in a diffusionist and unidirectional way in experiences of technicians-educators (rural extension workers) and students (rural producers, family members and employees) in remote communication environments. In this view, it would not constitute a dialogical environment, with active participation of students and educators, in the construction of truly participatory digital environments that are horizontalized in their relationships. Once the initiative for this would come from the educator, and assuming that the role of the technician-educator is linked to the creation of an infrastructure and the proposition of a dialogic environment, EDR and its respective significance in the pedagogical paths in the student is constituted in the relationships experienced in the most varied aspects of life.

In this new pedagogical context, the technician does not refrain from jointly building new educational paths with people who work and live in the countryside, assuming his role as an educator. We believe in a joint use of resources and remote

23 (2020) Moreira *et al*.

or face-to-face interactions in the technician-educator's work routine, added to the use of digital communication tools. With this, all subjects involved in the pedagogical action must learn new content, skills, and communication skills, which are necessary to transit in hybrid interactional environments, virtual and physical, where the moments of teaching and learning take place. For the educator, a new set of pedagogical perspectives for their work is opened. For Moreira and Schlemmer[24] this way of educating comprises:

> (...) from teaching and learning processes enriched by digital technologies and/or communication networks, to the development of a fully online and digital education, with variability in the frequency and intensity of both digital technologies and communication networks.

In EDR, when the interactions occur in virtual environments are united with the moments of face-to-face meetings in the countryside, a teaching-learning Ecosystem[25] appears, which is constituted by three dimensions: organizational, pedagogical, and technical. When we unfold these dimensions, it is necessary to promote public policies that offer a dialogical digital education reduced in the lives of the educator and the student, ensuring good digital literacy for people living in rural territories. Digital literacy refers to the abilities of a person to interact with electronic devices (cellular phones, computers, tablets, and others) and their programs. In addition, it is also important to guarantee access to a quality and affordable connection for people in the

24 (2020, p.5) Moreira; Schlemmer - Author's translation.
25 (2020) Moreira; Schlemmer.

countryside, to the acquisition of electronic communication devices (computers, tablets, cell phones, among others), and other important factors.

The educational environment for a participatory Digital ATER is part of a Networked Digital Education Ecosystem (ECDER) [26], which is made up of people, machines, softwares, and the web. A place to share information and develop cooperation, rich in knowledge and experience. An ECDER can reach any size, if the digital environment can contain all its interlocutors and allow planned interactions. At first, an ECDER, through the rural extension look, will present the following elements and actions:

- Identification of shared content: aims at the offer to the interlocutors sets of information on production processes and also on the lives of people in the countryside, such as new production techniques, forms and access to credit lines for agriculture, price surveys for the purchase of agricultural inputs and so on.
- The offer of a management method for learning: its goal is turned to develop a communication method to be developed, used, and formalized in interactions between the educator and the student in digital environments, e.g., actions and activities presented in applications or social networks of public or private organizations that provide ATER services.
- Determination of learning contents: educator and student make a cut of the subjects to be worked on in the interactions of ATER services.
- Construction of a repository of the contents worked: provide the student with a place on the web where the

26 (2020) Moreira *et al*.

contents of the pedagogical actions can be viewed. As in some WhatsApp groups where only the administrator can interact, working as an information library.

- Systematization of the flows of pedagogical activities: it is up to the educator and the learner to plan and to execute jointly the steps and activities that will constitute the educational process.
- Visualization of ways to assess the teaching process: the educator efforts, assisted by the students, verifies whether learning has been developed successfully, and if it has been used in their productive routines at the countryside life.
- Use of communication and dialogue tools: it is formed by the digital educational environment itself, as in the case of participatory Digital ATER, being constituted by social networks and applications of public and private organizations that provide services in rural territories.
- Constitution of technological support to guide students: educators and educators, through the ECDER, will have access to sets of electronic communication devices, their programs, and a web network that will provide technical support for pedagogical actions.

The pedagogical models developed for virtual educational environments will present a set of elements belonging to various dimensions of communication[27], related to the:

- Elaboration of rules for the community's interaction in the virtual environment, defining what types of behavior will be acceptable among members, as well as determining the rights and duties of all participants.

27 (2020) Moreira *et al*.

- Study of the pedagogical methodological paths that will be used during teaching.
- Determination of technological elements related to communication used in virtual learning environments.
- Plan of the software that will be used and where content and interactions will be offered during teaching.

When these constitutive elements of teaching in digital environments are superimposed, they can be classified into three educational models[28], namely:

- More centered on the educator: responsible for selecting and sending the content of the pedagogical action, which clearly takes its position of guiding the educational process to the digital communication environment.
- More focused on the learner: which presents, during the teaching process, a high degree of autonomy of the learners regarding the conduct of their teaching process.
- More centered on technology: it is up to technical resources to be the transmitter and mediator of teaching information, with learners and educators communicating little or no time during teaching. In this case, mediation is performed by the machine and the web.

ECDER expands the pedagogical possibilities in face-to-face meetings between educator and student. In this sense, in the countryside, the hybrid ATER is the result of the articulation and complementation of different learning environments, one of its fundamental elements being the virtual environment. In this ATER, the technician-educator struggles for the work on

28 (2020) Moreira *et al*.

the dialogical pedagogical practice an interactional plurality, methodological paths and contents offered by EDR, providing a closer and faster service from ATER to farmers. The form and contents that constitute its services can be planned and offered in a more particular way for each of the rural producers that interact. For instance, in a pedagogical context in which a farmer has good digital literacy, but with a low level of formal Education, the technician-educator can send instructions about operating procedures for the crop on some instant voice message application like WhatsApp or Telegram.

Through social networks, there is a possibility for the technician-educators to individualize their service to the needs of each rural producer they work for. Therefore, it is up to the technician to plan and try to guarantee a breadth and depth of services in face-to-face and virtual environments. The individualization of teaching necessarily involves the constant experimentation of new communicational paths, which enable the use of new forms and contents for different types of encounters between educator and student.

EDR is made up with sets of ICTs, which cannot be categorized only as pedagogical resources. ICTs are the educational transformation environments themselves, as they are the places where farmers share their experiences on electronic devices (cell phones, computers, tablets, and others) and browse (WhatsApp, YouTube, Facebook, and other mobile applications). The use of ICTs for EDR provides collaborative interactional environments, bringing these people closer not only to their educators, but also to other subjects who live and work in the countryside, who may or may not belong to the same places they live[29].

29 (2020) Moreira *et al*.

In the context of EDR in Digital ATER interactions, farmers will not be passive consumers of a technology or content, but rather one of its protagonists. An example of this is the use of the farmer's voice actively while developing the contents of a chatbot. Simply put, this program can be defined as a program in which the user makes a question, and the machine automatically offers an answer. The development of chatbot follows a set of specifications, which are linked to the goals of its use. It can be categorized into two groups, the first, through pre-defined rules, its evolution being static during its interaction with the user. The second is the use of systems that contain artificial intelligence, which seek from the user a "capacity to learn" through interaction, or through standardized data and information[30].

A chatbot built by a diffusionist pedagogical approach can impoverish the paths, voices and contents that pervade an ECDER. The educational model of the Digital ATER, participatory and dialogic with people who live and work in the countryside, seeks to achieve the new perspective of a reality in which technology enables the expansion of human perceptions, through a greater understanding of the variables that make up its productive processes. The ICTs should not occupy the central place of the educational processes, being only articulated by them on the communicational paths of the contents worked in the ATER services. But if they occupy this central place in teaching, ICTs will present an exclusively diffusionist pedagogical approach, and it will even be possible to identify the few voices that are part of their development.

Historically, diffusion teaching is constituted by hierarchical relationships, based on unidirectional communication (from sender to receiver) and mostly content. The technician teaches

30 (2021) Barbosa *et al*.

and the producer learns. On the other hand, in the dialogical relationships between technician and rural producer, both learn and teach, in a non-hierarchical and equipotent environment, through a two-way communication[31].

The definition of an ICT that will be dialogic or diffusionist begins with the answer to the following question: in what way, depth and breadth do the interactional actions occur between programmers, technician-educators, rural producers, their families, and employees, during the development of programs that will be offered in rural territories? A good start on the path to answer this question is to consider that an EDR with a dialogic approach intends to "articulate different presences (physical and digital); times (synchronous and asynchronous); technologies (analog and digital); cultures (pre-digital and digital)"[32], between educator and student.

Participatory Digital ATER does not intend to mean a break with the pedagogical paths historically constituted by the activities carried out by rural extensionists in their face-to-face moments in the countryside. Participatory digital ATER seeks constant pedagogical complementarity between physical and remote environments of interaction, both by the technician and the farmer. The idea is to develop pedagogical activities that are complementary and not distinct and parallel; activities that permeate these two interactional environments, also digitally.

During the planning of participatory digital ATER, the technician-educator will answer another important question: which didactic approach will be better accepted and understood by the farmer in the remote and digital environment, when compared to the face-to-face work? And vice versa. It is the

31 (2021) Zuin. (2019) Zuin; Zuin *et al.*

32 (2020, p.4) Moreira; Horta.

combination of these activities and learning environments that will constitute an ECDER[33], which will vary according to the teaching plan of the technician-educator and the pedagogical project that will be employed with the people who live and work, during the development work of a participatory Digital ATER in a hybrid interactional environment.

33 (2020) Moreira *et al*.

CHAPTER 2 - CONSTITUENT ELEMENTS OF A HYBRID AND DIALOGIC ATER

The systematic use of social networks and instant messaging applications, such as WhatsApp and Facebook, by technician-educators very usual in a big number of rural Brazilian territories. These technologies make it easier and faster to communicate with people who live and work in the countryside. However, Digital ATER methodologies aimed at teaching-learning processes in web environments are quite recent, in the very beginning of their maturation and systematization.

In their daily life, people in the countryside tend to use the internet for many purposes, such as remotely solving problems in their productive routines, and in life. Solutions can occur with the technician-educator or other professional who offers services in their production process. When verifying this interactional potential to the use of the web in the teaching-learning processes in the countryside, a participatory Digital ATER pedagogical methodology was developed, which we now describe.

This pedagogical methodology has been developed over the course of a set of 12 books, the first of which is the "Technical Operational Manual: Biosafety procedures for Covid-19 in meetings and in production routines between extension workers

and rural swine producers"[34], available to the public since May 2020. The Covid-19 pandemic anticipated the future of Brazilian rural extension in terms of the forms, places and moments of service interactions provided by technicians-educators in the countryside. In recent years, in many rural territories, ATER in the hybrid format has already come real. Given this, five elements are now listed to determine this new interactional reality in the countryside:

- **ATER service cost:** with ICTs, the cost of the ATER service will be mitigated. The number of face-to-face visits by the technician-educator to the property will be resized, with a smaller number of face-to-face meetings being necessary. However, considering the remote form, the intensity of interactions may be more frequent between these two subjects, once regulation is in order.
- **The scope of the ATER service:** the constant expansion of access to internet networks in rural territories may increase the number of rural producers served, by the same technician, jointly or individually, remotely, in asynchronous or synchronous moments[35].
- **The ATER service agility:** social networks and messaging applications provide virtual communication environments where a message can be sent and received instantly. This communicational path will be used to

34 (2020a) Zanella *et al*.

35 The term asynchronous refers to the interaction that takes place with interlocutors at different times, usually mediated by a machine. For instance, when watching a recorded lecture on YouTube. The meaning of the word synchronous refers to an encounter where interlocutors are dialoguing at the same time, in the same interactional, virtual or physical environment, both at a distance through a videoconference call, as a face-to-face meeting on the rural property (2020, Moreira *et al*).

streamline the ATER services between the interlocutors, such as sharing of a wide range of information, the possibility of clearing up doubts, booking visits to rural properties, and other activities.

- **Biosafety in the countryside:** regardless of the productive sector, the size and the composition of agricultural undertakings, the related and constitutive elements of biosafety in the entire rural territory will be constantly monitored by private and governmental organizations, such as those for health surveillance. For this, procedures and tools for managing the One Health in the countryside through remote controlling will be improved and deepened, preventing the circulation of pathogens in the property.
- **Teaching-learning environment** here comes an opportunity to develop an educational space where educators and students in rural territories can share experiences, information, and knowledge for courses in non-formal studies for all ages. This could happen in face-to-face and off-site moments with farmers on their rural property, like the pedagogical methodologies described in the 12 books described in this book.

However, the realization of these trends, which will help to constitute the Hybrid and Dialogic ATER, will only occur if a series of constitutive elements are fostered by private and governmental organizations. The first of these elements is the development of a participatory Digital ATER, which will provide an educational communicational environment for this new type of hybrid service, valid for both remote and face-to-face assistance. The second refers to the implementation of public policies necessary for the development of this type of service,

which is democratized for all rural producers, regardless of their location, size, and sector. Some of its interactional and pedagogical constituent elements will be offered throughout the next chapters.

Distance Education (EaD) reveals a potential to offer to the educator and to the learner a participative and collaborative pedagogical environment. The construction of this environment will depend on the posture that the technician will present with the farmers. The interactional possibilities present in applications and social networks are confirmed as a significant educational path in the countryside. Participation and collaboration between educators and students take place via videoconferences, discussion forums, electronic instant messaging applications, e-mail, among other remote communication tools.

Some educational centers have already verified the benefits of using social networks and messaging applications in their EaD courses, both for formal and continuing education. The benefits are mainly linked to the decrease in school dropout rates of its students[36], a fundamental point to be considered. Possibly, this positive scenario is related to a greater synchronous and asynchronous interaction between educators and students, when creating their own learning communities. In this remote interaction, it is possible to enhance the presentation of information, the formulation of questions, the clarification of doubts, the reinforcement of the acquisition of new knowledge, among other actions and pedagogical possibilities. The asynchronous interaction between educator and students allows students, in their time, to question, reflect, dialogue, and discuss the contents worked with other members from their community.

36 (2014) Rosa; Poellhuber.

This occurs so as not to interfere with their work tasks, thus enabling a decision on how to use their time to learn.

Interactions in instant messaging applications and social networks can provide participatory and collaborative teaching-learning environments, both in the countryside and in urban areas. Applications with pedagogical potential offer to educator and educating interactional environments that enable their own learning. It is not about learning in the sense of individualization, atomization, and mechanization of the teaching process, but the possibility of seeking subjects and contents of particular interest to the student's life. This search also occurs through posts and views with information and reports of other people's experiences, in groups or individually. Then, the exchange of experiences between educator and the learner leads to the development of a collaborative learning environment, through interactions with other people who have the same needs, but who are not necessarily part of the same rural territory. Individualization during learning occurs through the search for elements that permeate the student's life in relation to their dynamics, contents, and to their experiences, which may or may not be mediated by an educator[37].

In this educational context on the internet, one of the main roles of this technician-educator is to help the farmer to select technical and managerial information, comparing them with the productive processes and elements of his life, as well as from other people who live and work in their rural territories. This is an important activity, especially in these times of false news and offers of "miraculous solutions" for agricultural production processes that abound in internet environments.

37 (2014) Rosa; Poellhuber.

The technological evolution of the web, programs and communication devices enabled the emergence of instant messaging applications such as WhatsApp, which allows voice and video calls to be made. This application also presents the possibility of sending messages in the format of audios, texts, pictures, images, and emoticons, providing synchronous and asynchronous relationships in rural and urban spaces. The internet also boosted it, when defined the "new need" of connectivity infrastructure, data communication and access to these applications in territories that do not have a physical internet network. Messaging applications are markedly changing the relationships of people in rural territories, including interactions involving decision-making in productive routines, with the potential to facilitate, expand and provide services from the technician to the farmer. For instance, several extensionists together with farmers have developed new channels for marketing their rural production to consumers in cities, thus ensuring the viability of their work and income, given the limitations imposed on encounters by the new coronavirus pandemic.

The main challenge of Hybrid and Dialogic ATER, regarding its methodological and pedagogical constitution, is to prevent its development and offer from being based on a technical educational model. This teaching approach structured a good part of Brazilian distance education via web, especially at its beginning, in the mid-1990s, through the construction of a self-instructional teaching model, mediated predominantly by the machine and the behaviorism[38]. Due to this technicist posture, synchronous and asynchronous interactions between educator and student were relegated at that historical moment, largely due to the technology available at the time.

38 (2014) Rosa; Poellhuber.

The behaviorist pedagogical methodology is based on unidirectional and hierarchical content transmission, with relationships grounded in passive interactional environments between educator and student. Historically, the behaviorist model of teaching in rural territories was called technicist diffusionism. In 2021, it is still present in a good part of the technical assistance work in agricultural production systems, both governmental and private[39]. The simple transposition of the diffusion model of presential teaching to the online environment is not an option for Digital ATER, which intends to be participative and dialogic. From a pragmatic point of view, it will be a mistake for Digital ATER to develop only pedagogical interactional paths that aim to resolve specific doubts of technical referrals for agricultural production. An example would be the main use, in interactions between technician and rural producer, of chatbot-type applications that simulate communication between people, helping to build a diffusionist Digital ATER.

There is no contradiction between the development and offer of applications in rural territories for dialogic interactions in the countryside, if the voice of the rural producer is considered, since its development by the programmer, constitutes an equipotent environment. Therefore, these programs are used as another form of support for asynchronous relationships between technician-educator and farmers on their rural property. Another important aspect that will define whether chatbots have diffusionist or dialogic characteristics is how they will be developed, and which voices assimilated with their own intensities will be used in their constitution.

In the diffusionist environment of development and application of chatbots in the countryside, the use of technologies

39 (2021) Diesel *et al*.

is sought to replace direct, synchronous, or asynchronous contact between people on the rural property. This education tool is nothing more than an asynchronous interaction between the farmer and a group of people who created a database of information, following a logic of corresponding questions and answers. In this case, communication takes place through a group of previously elaborated answers that, at the moment of interaction with the farmer, a certain solution is chosen and offered by the machine. The machine itself chooses an answer through the recognition of keywords contained in the farmer's question. There is a high chance that the developers of these communication systems have never visited the user's (farmer) rural property or carried out ethnographic research with the subjects who will interact with the application with this public. They may also have little knowledge of the intricacies of rural production and its countless varieties and alternative responses. The machine's challenge is to identify the immense variability of country life, as well as the diversity of interactions between people and their biomes.

The breadth, quality and possibilities of solutions offered to the farmer will depend directly on the quality and work environment created by these programmers, technician-educators and other subjects who participated in its production. In monological interaction environments, there will be a smaller offer and range of possibilities for solutions because fewer voices will be heard and considered during the decision-making process of which question will be placed in the program.

During the use of the chatbot, as a pedagogical interactional tool, a synchronous relationship is observed, but performed by a robot (i.e., a software specifically developed for automatic responses). A set of simple questions regarding the use of this technology in the countryside would be: are farmers comfortable

when interacting with robots? Would they approve this technology to answer questions that will sustain and determine a decision-making process in their productive routines? It is important to point out that synchronous or asynchronous contact with another human being does not characterize the teaching-learning process as being dialogical. The technician can be even more diffusionist than the interaction provided with "a teaching machine", such as chatbots. On the other hand, with a dialogic look, several possibilities of using chatbots as a dialogic tool in teaching-learning processes in the countryside can be observed. One of the scenarios is its use as a content repository, as a knowledge base, involving preparatory information related to production processes and, also, the life of a particular community. For a chatbot to be dialogic, it is necessary that during its development process, its form, contents, and ways of interaction with farmers present the following elements:

- **Form:** the interaction between farmer and chatbot will be offered through text, images, or voice command. The farmer asks and the application answers with a sound (also a voice), text and image, simultaneously. The importance of developing this form of interaction is due to the increasingly advanced average age of rural producers. Over time, your senses can become compromised, and the vision limited.
- **Content:** It will be personalized to the difficulties or the potential of the target public (social, economic, environmental and health aspects), presented by a particular rural territory. Hence the importance of proximity and dialogical relationships between programmers, technician-educators and rural producers

when choosing and updating the contents of the databases presented in a chatbot, or any other type of program.

- **Paths:** the programs need to foresee possible online and offline interactions with the internet network, due to an eventual deficient coverage of this service in a region and other technical difficulties for its offer and use that may occur in the countryside.

A path that will be enhanced with the arrival of the new web 4.0, in the coming years, is the offer of applications with augmented reality and internet of things resources with technical support of 5G communication technologies. In this new technological context, teaching-learning processes cannot be designed in a simplistic way, only by replacing the educator with an application with ready-made answers, a Skinnerian teaching machine[40], based on the conditioning of the student and which ends up inhibiting a dialogical proposal of Education.

The sense of rural communication in the context of the hybrid and dialogic ATER is based on human interaction, through an expansion and deployment to rural space of technological content developed by universities, research centers (governmental and private) and other organizations, considering the experiences of people and the things to which they themselves attribute value. A dialogic look developed through a theoretical perspective of authors such as M. Bakhtin[41] and P. Freire[42].

It would be very reductionist on our part to understand the interaction in life under these single authors, not least because none of their theories managed to be closed in on themselves,

40 (1974) Skinner.
41 (2010, 2006, 2003) Bakhtin.
42 (2014, 1997, 1977) Freire.

for a complete explanation of interactionism in life. However, it was understood that the directions offered by their theoretical bodies could greatly elucidate some practices, like the exercise of the technician-educator in understanding their own work in the countryside.

In a ponderation with the help of Bakhtin, it is possible to understand the importance of the spoken word as the object of study of the interaction between interlocutors. In the case of participatory Digital ATER, it would be directly the word of the academy, represented by the didactic resources and the speeches of the technician-educator when arriving in the countryside, as well as by the answers (also spoken) during their reception by the rural producers. The author states that "the word reveals itself, at the moment of its expression, as the product of the living interaction of social forces"[43]. Paying attention to how words are articulated in countryside dialogues was the concern of the Pedagogical Actions Development Teams (EDAPs), during the preparation of the 12 books and their teaching materials, which provide a pedagogical methodological basis for participatory digital ATER.

Subjects appropriate another important nature of interaction, linguistic analysis. We explain that language, language, and speech are social acts and need to be adjusted in the coming and going of words, in the contents of utterances, of the interlocutors. Certainly, there is a clash of senses and meanings between the subjects in the act of dialogue, since the universes of meanings surround the moments in which the paths taken in communication happen by the agents involved. But the development of a dialogic posture of the technician is essential, the aim is to defend one's own meaning, as well as being open

43 (2006, p.48) Bakhtin - Author's translation.

to the meaning of the other's words. Here, we are discussing the meanings in exchanges of technologies and elements of science, knowledge, experiences, and experiments. Without ranking the importance of the contents spoken in the relationship between technician-educator and rural producer.

In this instance of discussion, it is considered the deepening of the issue of unilaterality and bilaterality in the interaction in participatory Digital ATER, regarding the exchanges and meetings of science technologies, brought by the technician-educator, and those social technologies offered by the farmer. These encounters and exchanges are our object of analysis. The one-sidedness of thought revolves around the experiences that each subject had throughout their lives and built their identity. In contrast to the bilaterality in the intersections between other people and humanized objects, which would form other senses and meanings in the interlocutors' identities. This subject is constituted and constitutes itself in the other[44]. Therefore, there is a feeling that only the lived space, in the case of rural producers and technician-educators from universities and research centers, does not provide an understanding of their relationships, since to be an educator in full, it would be necessary to counteract the external elements of the interaction belonging to other places. For this, the extension workers would get to know and experience the countryside. On the other hand, the rural producer would interact directly with universities and research centers. These two different views of life would get together and be merged in rural territories during the services of ATER[45].

44 (2006) Bakhtin.
45 (2014) Zuin, Zuin.

One of the most important references for the base of this model was a survey[46] structured by the Brazilian Association of Rural Marketing and Agribusiness. It was carried out in 2017, revealing that the main digital social networks that farmers used to connect, inform, and interact were: WhatsApp (96%), Facebook (67%), YouTube (24%), Messenger (20%), Instagram (8%) and Skype (5%). These indicators were used in the development of pedagogical practices to be presented in the next chapters.

Probably, an increase in the internet network in rural Brazilian territories via cellular phone access is expected, despite the current technological and interactional limitations. Many rural producers, especially those from farming families, started to use the interactional path of instant messaging applications, such as WhatsApp[47], to communicate directly with their input suppliers and with the consumers of their products, promoting sales channels directly to its urban audience.

In Figure 2, the interactional arrangements that constitute the hybrid and dialogic ATER are exposed, inserted in a pedagogical and communicational context of a participative Digital ATER, composed of the moments experienced by people (technicians and farmers) during remote and in-person activities in the countryside. In the development of all these views and pedagogical moments of hybrid and dialogic ATER were based on a group of authors[48] who spoke about the themes that reward it and another by the description of the didactic methods used in

46 (2017) ABMRA.

47 (2020) Arias Segura.

48 (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil-MAPA; (2021) Ribeiro *et al.*

the production of the 12 books[49], which will be described below in this work. The relationships that constitute a dialogic Hybrid ATER between people who live and work in the countryside can occur in three distinct moments in time: before, during and after face-to-face contact on the rural property or in the offices of extensionists in cities. Participatory Digital ATER would be the teaching-learning environment of the interlocutors in their rural territories, defining a hybrid learning, regarding the time and place of interactions.

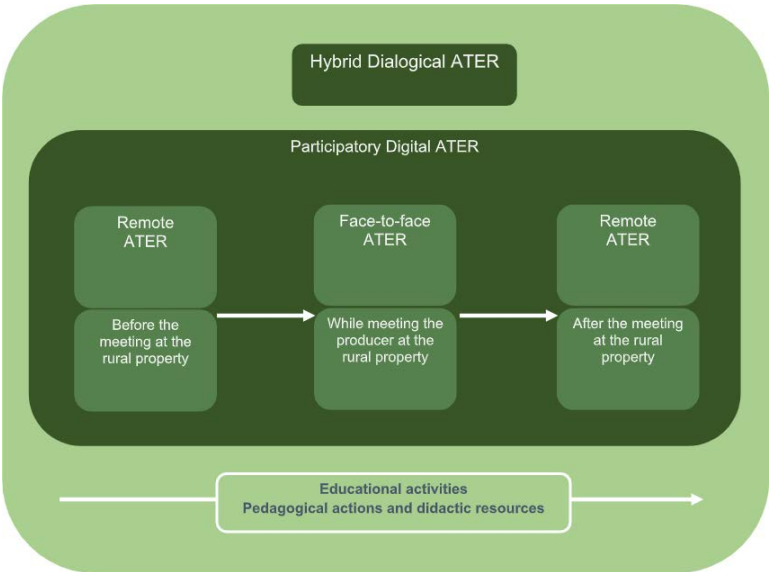


FIGURE 2 - Hybrid and Dialogical ATER

Source: adapted from (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil -MAPA; (2021) Ribeiro *et al*.

49 (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil - MAPA; (2021) Ribeiro *et al*.

In a pragmatic way, at a first moment in time, prior to the face-to-face meeting between the technician and the farmer, the information offered by the communicational path of participatory Digital ATER anticipates, for the rural producer, what the work will be like when they are physically together in the countryside. The contents worked at this time are varied, such as information for the improvement of production processes, distribution, and marketing of its products. Through this activity the farmer will be able to visualize a possible future for his production and for in his life. Alternatives for innovation can come from new technologies through public policies, such as the use of communication channels in virtual environments and in person in the countryside. In this type of distance interaction, Participatory digital ATER is shown as a procedural support to the non-face-to-face meeting in the countryside. For instance, in the books that address the issue of Covid-19[50] prevention, they were offered to the technician-educator and rural producer in the form of a set of voice messages, texts, posters, infographics and videos, containing various information about the procedure's biosafety, to be used before, during and after the visit of the technician to the property.

After the ATER first contacts, and while at the face-to-face meetings with the farmer in the countryside, the technician-educator will be able to offer information and recommendations directly through messaging applications. Possible doubts and recommendations for important solutions are shared through these channels. A good potential for the technician to make use of effective and immediate be (remotely) by the rural producer's side. In the Covid-19[51] contagion prevention books,

50 (2020abcd) Zuin *et al*; (2020ab) Zanella *et al*; (2021) Sousa *et al*.
51 (2020ab) Zuin *et al*.

this form of communication was proposed for the use of the rural extensionist and the inspection agent with farmers. This communicational path was chosen in the virtual environment of the contents to be used with farmers, both in face-to-face meetings on the rural property and at a distance, avoiding the use of educational materials on paper, such as booklets and pamphlets. If farmers and technical educators did not have cell phones or did not know how to use this digital communication path, some posters could be designed and printed. At the time of the meeting on the rural property, the posters would be offered and shown to the people who would interact. When returned to the technician, they would be sanitized with 70% alcohol, and could be used again in another property.

The potential of Digital Teaching in Network is significant to allow the flow of the contents arisen and structured by participative Digital ATER after face-to-face interactions in the countryside, in a second remote moment with technician-educator and farmer. The horizon is also expanded for other people who live, work in the countryside and do not have access to the content available during the face-to-face meeting, such as family farmers members. Participatory digital ATER can be used as a support method to help resolve doubts, uncertainties and difficulties faced, which naturally come up when a new technology is being offered or introduced in production routines on the rural property. This interaction with the technician, even remotely, can be performed synchronously or asynchronously. In the context of inserting a new technology in production routines, it is important that the technician continues to support the farmer regarding the changes that naturally occur and may cause apprehension and uncertainty. Now, it appears to be clear how to look at the role of participatory Digital ATER communicational support in these three moments of interaction (before, during

and after the face-to-face meeting), in both places (on or off the property), the environment (in person or remote) and the time (synchronous and asynchronous).

Participatory Digital ATER comprises four dimensions[52]: inclusion, technological, pedagogical, and interactional. They can be merged and complete each other in meetings between technicians, rural producers, family members and countryside workers (Figure 3).

The first dimension, **inclusive,** reflects the degree of digital literacy and literacy that the interlocutors have (rural extension worker, inspection agent, farmer, family members and employees). Without a certain skill in handling the device and applications, communication between the interlocutors will be compromised. Complementarily, a low level of literacy will also reflect difficulties in using the device and understanding the content of the messages. However, people who are illiterate, or with a low level of formal education, can also frequently and competently use some communication features of instant messaging applications, such as WhatsApp. For this, voice messages, videos, pictures, and photos are used in their interactions. People who will experience virtual and remote communication environments need to have some degree of digital literacy.

The second dimension is the **technological** one. It seeks to know the degree of maturity of the technologies of electronic devices that can be used by interlocutors (cell phones, computers, tablets, among others). As well as the availability

52 (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil -MAPA; (2021) Ribeiro *et al.*

inside and outside rural territories to access, with quality, an internet network that allows the exchange of messages containing voice, text, video, photos, and pictures files. This dimension is surely related to the development of public policies aimed at accessing the web for people who live and work in the countryside.

The third dimension, the **interactional** one, seeks to identify the type, time, forms, and paths of interaction, which will determine the depth and proximity of the relationships between interlocutors, technicians-educators and people who live and work in the countryside. This diagnosis is essential for good digital communication, as well as the production of teaching materials for use with farmers and their families. A simple example is to determine which were the technical and procedural paths that the subjects took to implement the projects and their impacts (socioeconomic and environmental in the countryside).

The fourth dimension refers to the **pedagogical**. It is intended to develop and determine which methodologies and teaching-learning resources would be the most suitable for each: form and moment of interaction (remote or in person); degree of literacy/literacy of interlocutors; quality of ICTs available in rural territories; and the forms and proximity of interactions between technician-educator and rural producer.

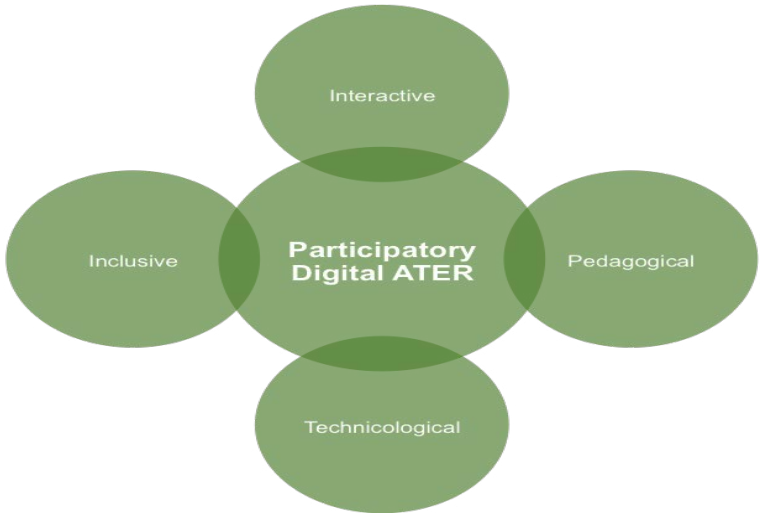


FIGURE 3 – Constitutive Dimensions of Participatory Digital ATER
Source: adapted from (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil -MAPA; (2021) Ribeiro *et al*.

The recognition, study, and solution proposals for the four dimensions of participatory digital ATER will determine which sets of didactic referrals will be developed for each of the interactional moments, before, during and after the face-to-face meetings of the interlocutors in the countryside. Then, meetings will depend on the maturity depth and degree in each of these dimensions in the historically constituted relationships between rural extension workers and people who live and work in the countryside. Through this act of choosing the pedagogical paths, it will be determined whether the educational process was significant during the work of ATER. All these elements will constitute and help to systematize a participatory digital ATER.

CHAPTER 3 - QUESTIONS AND REFLECTIONS FOR PARTICIPATORY DIGITAL ATER

In an analysis with structured discussion that considers the four dimensions (interactional, inclusive, pedagogical and technological) that precede the digital participative ATER, a series of questions, reflections and possible directions begins to inspire and motivate leaders (public or private) and technician-educators. In order to stablish this methodology, the group of researchers in this project made a survey in which the participants answered the 13 questions[53] that would help to build a participatory Digital ATER in a particular rural territory. Questions about connectivity, interactivity, teaching method, physical limitations of the user, among other sets of information.

This survey about the countryside would be answered and used by the leaders of ATER associations and their technician-educators for the development and planning of teaching materials (media) and pedagogical actions for a given topic. The way to answer these questions involves acts of reflection and comparison of the reality experienced with the theorized in the

53 (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil -MAPA; (2021) Ribeiro *et al*.

countryside. The reflection activity is related to the medium, content, form, place and time of interaction in the interlocutors' lives. If some of these questions are not answered and resolved properly, there is a risk that pedagogical actions and their teaching materials will not be able to achieve their goals during the Educational practice, for people who live and work in the countryside (Figure 4).

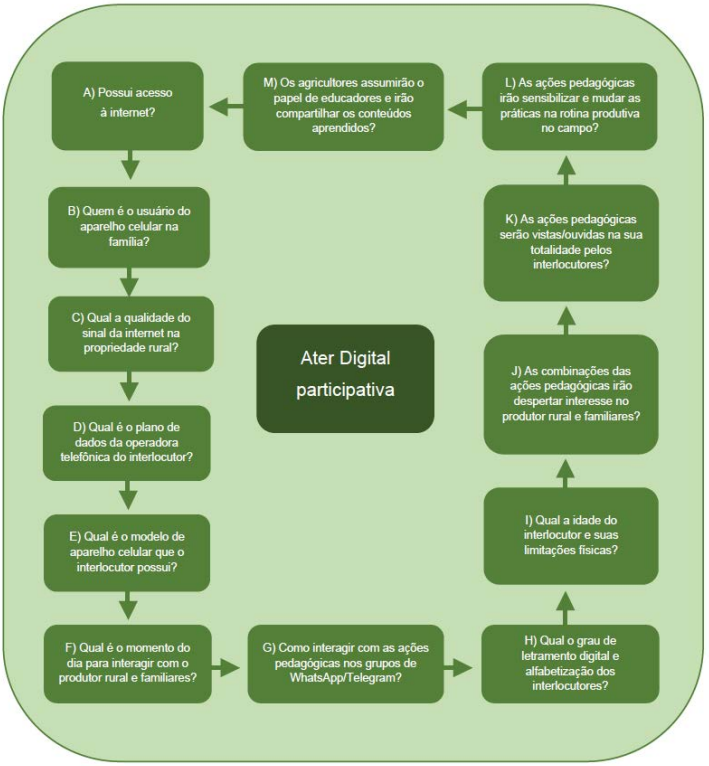


FIGURE 4 – Questions to structure the work of the participatory Digital ATER

Source: adapted from (2010, 2006, 2003) Bakhtin; (2021) Freire; Guimarães; (1977, 1987, 1997) Freire; (2020) Moreira *et al*; (2015, 2002) Larrosa; (2021, 2014) Zuin; Zuin; (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil -MAPA; (2021) Ribeiro *et al*.

Below are the guiding questions and proposals for reflection, aiming at the planning, development, and implementation of participatory Digital ATER in the countryside. In the construction, this set of questions, all the smallest interactional elements that appeared during the making of the 12 books developed using this pedagogical methodology was very important. Thus, the questions that arose in random order were distributed, and an attempt was made to establish a reflection script that did not aspire to be final solutions, but pedagogical referrals for the participatory search for new referrals directed to people living in each rural property. This procedure is essential for the teaching-learning process to take place in the field, via the web, of people who live and work in the countryside.

A) Do you have access to the Internet?

Reflection: the technician-educator's first reflection is to determine in which places his interlocutors access the internet network. Not only in their rural homes or productive systems, but also in the homes of neighbors, relatives, in the city etc. A strong indication of internet use is the percentage that 80% of people living in rural territories have cellular phones, even considering that only 65% of rural households have access to the internet network in their homes[54]. These percentages indicate that people living in rural areas access the internet in other places, such as work and the homes of family members and acquaintances. An example of access outside the rural property would be through the farmer's son, who goes to the city to study and takes his cell phone with him, or even when the farmer searches his neighbor's network for access to the web, or other places.

54 (2020) CETIC.

B) What are the cellular phone carrier plans?

Reflection: not always in the family, the farmer or producer is the main user of cell phones or other electronic devices (computers and tablets). An important activity of the technician-educator is to know who accesses the information and distributes it to the other family members. Because depending on who is the main user of the device, it can indirectly characterize that rural producer and producer have a low degree of digital literacy and formal education as well. In this pedagogical scenario, the technician-educator will develop pedagogical actions that arouse interest and aim to educate both the main interlocutor and later family members. In this educational context, the main user assumes the role of educator in his family. One of the consequences of generation encounters is the possibility of pedagogical actions being one of the ways for the main user to contribute to the education of the use of devices and programs.

C) How strong is the Internet signal in the rural property?

Reflection: access to the internet in the countryside with quality and reliability depends on the signal offered by the providers. Knowing this information is crucial for choosing which pedagogical action and which teaching materials that will be developed and offered by the technician-educator. For instance, pedagogical actions containing videos require a stronger network signal and speed when compared to text messages. An indication of the improvement in the quality and reliability of the internet in the field was observed in the survey carried out by the Internet Steering Committee in Brazil[55], in which it was

55 (2018) CETIC.

found a decrease in the number of downloads of music files by users. In 2014, it was 51% and in 2019 it was 41%. The same trend was observed for movies: in 2014 there were 23% and in 2019, 16% of downloads. The research refers to the junction of rural and urban environments. This behavior of people to reduce downloads of these types of files probably occurs when accessing services from streaming platforms, which have become popular in recent years. On the one hand, this behavior makes it possible to save memory space on the cell phone. However, it hinders the possession and sharing of these audiovisual materials among people, as in the case of the pedagogical actions and teaching materials described in the 12 books developed in this work.

D) What is the cellular phone carrier plans?

Reflection: depending on the data plan contracted by the farmer or family members with the internet provider company, it may be impossible to send some media such as videos that require significant data traffic on the web. In 2020[56], 65% of people living in the countryside had a prepaid plan with their operator, while only 19% of them contracted postpaid plans. Generally, even if the videos are of short duration, the caller's data plan can quickly be consumed and depleted. Some telephony and internet providers may also limit voice and video calls via WhatsApp, making communication between interlocutors more difficult. Knowing the data plan contracted by the people who will communicate in rural territories is an important task for the technician-educator, for the choice, development and application of pedagogical actions and teaching materials in the productive processes in the countryside and in the lives of farmers and families.

56 (2018) CETIC.

E) What are the mobile devices your family members use?

Reflection: second-generation cellular phones, launched in the 1990s, are destined to be discontinued by the companies that manufacture them. This type of device can receive voice messages, texts, pictures, and videos. However, viewing and interacting with some of these forms of messages can be compromised by several factors, such as the time it takes to download a video message, which discourages the interlocutor from downloading. Other types of communication are faster and possible with this type of device, such as text messages sent via SMS (Short Message Service), which are still widely used in some countries, such as India[57], to quickly contact rural producers. In this country, the proposal for the use of this type of interaction via SMS, by rural extensionists, would be to quickly alert or recommend a punctual technical procedure to farmers. An example would be forecasting the weather, whether it will rain or not, and associating this content with a recommendation for an activity such as planting and harvesting a crop. However, this form of message content is significantly limiting for more complex pedagogical interactions, such as information related to the various types of agricultural credit, which are offered every year by financial institutions to rural producers. Issues such as the various financing and credit possibilities for the countryside may require more frequent and detailed contacts between technician-educator and rural producer, using voice messages, images, videos and pictures for interactions. The purpose of these informational contents is generally to clarify doubts and propose new directions and contents between the technician and the farmer. Hence, the need for rural producers or their families

57 (2018) Mohanakumara; Biradar (2011) Aker.

to have third-generation cellular phone models, a smartphone. So that they can interact, for example, with the pedagogical actions developed in the 12 books developed, via electronic messaging applications such as WhatsApp. 2020 data obtained[58] in rural Brazilian territories observed that by cell phone: 34% of the people interviewed sent e-mail, accessed websites and web pages; 57% of them used social media; 48% downloaded apps; 57% sought information; and 78% sent electronic messages.

F) What is the best time for the contacts with the rural producer and the family?

Reflection: normally, every day, rural producers, their families and employees receive a large number of messages via WhatsApp and Telegram. The technician-educator must know the moment of the day when they are more willing to interact and reflect on the content sent in a pedagogical action. Thus, it is possible to define the dissemination strategies of their pedagogical actions. For this, it is essential to know what the productive and life routines of these people are. The productive routines may change according to some elements, such as: the time of year; production system; type of production (animal or agricultural); among other factors. From a pragmatic point of view, the objective is to try to send the message at a time that makes it stand out from the others received. The highlight concerns the position in which it will find itself in the application, it would be interesting for it to be one of the first that the rural producer will see when opening his WhatsApp or Telegram. For example, knowing that this audience performs this activity more frequently in the early morning, it is recommended that messages be sent a little before this time.

58 CETIC (2020).

G) How do you feel comfortable to interact with the actions in the groups of instant messaging on the cellular phones?

Reflection: in the daily interactions between rural producer and technician-educator, via instant message application, pedagogical actions can be sent individually or in groups. When sent as a group, care must be taken, the creation of a "mirror group", which will be closed to interactions between participants. In this type of group, communication between people is not possible, they can only view and download the files made available in it. Despite being an interactional environment that is not very dialogic - as it does not allow for the interaction of members - the objective of this type of group is to function as a large repository, a library for the didactic materials of the pedagogical actions[59]. However, there are limitations on how to store these messages. New referrals that may arise during the work and questions that require highlighting, among other information, can be worked out in the original group, where interactions are free. The answer to a questioning of a pedagogical action

59 In Brazil, in 2021, SMS were stored on operators' chips. Thus, the number of messages that could be saved depended on the size of these memories. Messages sent via WhatsApp could be stored in the cell phone's memory or an auxiliary memory chip, depending on the configuration chosen by the user. When the user decided on another operator and changed the SIM card, all messages were deleted, unless operators had already made available the storage of these messages on their servers, which was not often. Similarly, it happened with messenger-type applications, which had the option of storing their posts on the cell phone itself. When exchanging devices, it was also possible to lose these posts. WhatsApp only provided the stored videos and audio while they were available on the source device. Therefore, the user could not have chosen to save them on the recipient's cell phone. However, it is worth remembering that this last option quickly used up the memory of cell phones, especially the older ones.

in this open group can be highlighted and placed in the mirror group, to be stored. The proposal of these interactional paths is that pedagogical actions are not lost in the volume of daily messages that this audience receives, being possible to retrieve them easily when necessary. Pedagogical actions may be sent to rural producers in a timely manner, for example, to clarify any doubts or reinforce the correct execution of a procedure. Of course, in this case, the rural producer will already be part of the previous WhatsApp groups (original and mirror). If the producer is added to the WhatsApp group after the start of sending the pedagogical actions, the technician-educator will individually send the contents already posted and worked on. In Telegram application groups this limiter does not exist, as a new member has access to messages that were previously posted.

H) What is the formal Education level of the family members?

Reflection: this is probably one of the most crucial diagnostic activities to be carried out by the technician-educator in rural territories, as this information will determine the contents (didactic materials) and forms of the pedagogical actions that will be developed and offered to their interlocutors. Briefly and punctually, digital literacy refers to the knowledge and skill that a person has when handling the cellular phone and its applications, in our case, electronic messages. The educational would be the individual's ability to read and interpret texts present in the contents of pedagogical actions and use them in the routines of their lives. Some surveys[60], carried out in rural and urban territories, investigating people who live in the

60 (2020) CETIC.

countryside and cities, report that 35% of illiterate people access the internet through their cellular phones. With elementary education, this index grows to 79% of these people; 97% with secondary education, reaching the maximum access of 99% for those individuals who have higher education. Therefore, the importance of the technician-educator in developing contents (didactic materials) of the pedagogical actions that contemplate all these audiences.

I) Is there someone in the family with health disability? How old is this person?

Reflection: the population that lives and works in the countryside is increasingly aging, demanding from technician-educators an attention to the development of pedagogical actions and their teaching materials that facilitate interaction by this public. Investigations[61] carried out in the countryside and in the city indicate that 58% of people over 60 years old access the internet. As age decreases, the use of this form of communication increases. The survey indicates that 94% of subjects between 45 and 59 years old are already frequent users of the web environment through their cell phones. Most Brazilian farmers (46.8%) are between 45 and 65 years old[62]. Age can be a limiting factor for viewing didactic materials for pedagogical actions. Even having a good digital literacy and being literate, they can have difficulties with vision and motor skills, which arise naturally over time. For example, rural producers may simply not be able to access and view text messages, pictures, and videos due to difficulties in seeing their content. In this case, it is recommended to use voice messages in interactions. The motor skill will also be considered

61 (2017) IBGE.
62 IBGE (2017).

by the technician-educator for the development of easy access to the applications. This recommendation is especially valid if the pedagogical actions are placed in an application developed by the educator, without using the interactional environments of WhatsApp and Telegram as propagators of their teaching materials.

J) What the motivation signs to the project demonstrated by the family?

Reflection: the issue of combining the teaching materials that will constitute the pedagogical actions is an activity that the technician-educator must carry out, which will depend on the public that will communicate in the field. Older farmers may have difficulty reading text messages, on the other hand a voice message may be sent, along with the text message, or an infographic. People with a low level of education may be more comfortable interacting with messages in the form of videos and photos. These two types can be merged for this audience in the countryside.

K) How much of the pedagogical actions will be received in their entirety?

Reflection: identifying the aesthetics of teaching materials is an important factor for the development of pedagogical actions. Music, accents, words, pictures, genres, among other elements that make up the messages, will be used so that the interlocutor can identify with its contents. However, we try to take care so that the teaching materials are not stereotyped, which can be understood as offensive to the interlocutor, causing a repudiation effect, opposite to what is desired by the educator. Therefore, the technician-educator seeks, as far as possible, to consult people

representing the public who will communicate, to analyze the contents and media of the pedagogical actions that he produced. Another important element for interlocutors to see and listen to teaching materials is the time they will have for these activities. For example: voice messages that last more than a minute in your time may not be listened to fully, or even not opened by farmers. A picture, other didactic material, that takes a long time to be downloaded can also be a determining factor for the interlocutor not to interact with it. All these elements and others that can be identified will be considered by the technician-educator, during the development of their educational practice.

L) Will the pedagogical actions bring sensibilization and transformations in the routine practices of the producer's life?

Reflection: every pedagogical act presupposes the construction of a critical look at the student, comparing their productive and life reality with other possibilities. The pedagogical act with a dialogic approach seeks to sensitize and make the interlocutor aware of the difficulties that permeate his life, always questioning the person, trying to start a movement towards another reality, which will be built together with the technician-educator and others subjects who live and work in their rural territories. Messages may have proposals for a new future, comparing with what has been experienced, ending with questions and new referrals. The purpose of the pedagogical actions is to provide informational support for changes to occur. Support is not just sending the message, but also the act of comparing its content with the producer's reality, from the planning stages, through the implementation of new technology and transforming it into a new production routine. Technological support via communication via WhatsApp and Telegram is increasingly present in the work

between the technician and the rural producer. This digital interactional path tends to be more effective when there is already the physical presence of the technician-educator on the property. The encounter in the digital teaching environment on social networks is really crucial to the physical interactions that take place on the rural property.

M) Will the rural producers take the role as educators and share the knowledge learned after the ATER project?

Reflection: the process of awareness of reality in people who live and live in the countryside can awaken in them the posture of an educator. One of the consequences of this posture is the sharing of what you have learned with other producers, family members and employees. If possible, it is up to the technician-educator to guide how this offer of teaching materials can be carried out, so that it is as broad and meaningful as possible for people who relate to rural producers. The activity of sending the contents of the messages to other farmers should be encouraged by the technician together with all his interlocutors, with whom he had contact in the rural territories where he works.

The answers to all 13 questions that will be carried out in a diagnostic stage will determine the audience, place and means for sending the pedagogical actions and teaching materials. Having access to the answers to these questions is a fundamental activity for the technical-educator's work in the construction of a participative and dialogic Digital ATER in rural territories. This broad look at reality, seeking a dialogical alterity as close and complete as possible, makes it necessary to train professionals working in the field in the participatory digital ATER works on this topic.

CHAPTER 4 - THE DIALOGICAL TECHNICIAN-EDUCATOR FOR A PARTICIPATORY DIGITAL ATER

Thinking about a Digital ATER model that is participative among the actors that make up the agricultural production chains is an act that seeks to consolidate contents, formats and pedagogical paths that support the teaching-learning processes in the field. Historically, there have always been various types of meetings regarding the depth and breadth of the relationship between technician-educator and producer on rural properties. They can take place from a simple technical assistance to solve a specific problem, to the implementation of a project for rural development linked to a public policy, covering an entire rural territory. The interactions in this second case would be more complex when implementing its contents composed of various types of chains of activities and tasks over a period. These longer relationships presupposed the use of pedagogical methodologies that needed more time and more flexible meetings between people who lived and worked in rural territories, respecting their ways of living and productive know-how.

To this end, a Participatory Digital ATER sought to offer a set of methodological-pedagogical paths to be used in the most varied forms of meetings in the field. The idea was to follow

the pedagogical guidelines, didactic resources and themes developed and used in books[63] on: covid-19 prevention in rural territories; the proper use of veterinary products; prevention of the *Fusarium* Race 4 Tropical fungus in banana planting; rights and citizenship in the countryside; and credit and indebtedness. In this set of books, there were also suggestions for pedagogical and communicational suggestions for the dissemination of their contents via digital social networks. Consistent with the results found by AMBRA[64], which exposed the most common forms of interaction via mobile devices in rural areas, WhatsApp and its similar Telegram was brought to the development of pedagogical materials. These interactional paths were perfected throughout the preparation of the works, as to their forms, uses and directions.

In the context of Participatory Digital ATER, the technician-educator seeks to develop educational strategies and teaching materials to be used and distributed via instant messaging applications such as WhatsApp and Telegram. They have advantages due to their low development cost, their quick implementation and a frequent update of the contents worked on. In addition to benefits, this pedagogical proposal seeks to awaken in people a quick engagement with the content, transforming them also into educators, distributing the pedagogical actions on their social networks. According to the degree of their participation, they can propose new contents, ways of using and forwarding the pedagogical actions they have experienced.

63 (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil - MAPA; (2021) Ribeiro *et al*.

64 (2017) AMBRA.

The search for particular and unique meanings of Digital ATER agents in rural territories - constituted by the action of those who work and live in them - will determine the breadth and depth of the internalization of the statements and contents present in norms and guidelines, in production routines and in the life in these places. It is necessary to understand the processes of formation of new senses and meanings in the interlocutors during the application of this ATER methodology. It can occur in various types and ways such as in-person encounters or remotely in properties, in synchronous and asynchronous moments. Throughout this book, the reader will come across sets of didactic guidelines that will help their methodological conduct.

Another way to think about mobilizing agents, receptors, influencers, and implementers of this methodology would be to analyze the issue of language during contacts structured around dialogues. Based on our experiences, we found that linguistic variation (the language used by speakers of academia, in this case, technicians-educators, who went to rural areas in Participatory Digital ATER actions) needed to be adapted for a communication that was closer to their own interlocutors, producers and family members. The 12 books developed with this participatory Digital ATER methodology were written to be handled by the technician-educator in their teaching-learning processes. In them there was a brief theoretical part on the subject discussed, written in a technical language used in universities and research centers. However, the teaching materials (voice messages, texts, posters, infographics, and videos) were offered in a language in which people who live and work in the countryside would be more familiar.

It is not emphasized that some linguistic variant is easier, more difficult, more complex, or more effective than another.

The issue we bring up is the exercise of, within the same language, promoting openings to new speeches, including forms of expressions that would not necessarily include the verbalization of the word. We considered that technology, no matter how much it is used in the digital environment, is one of the forms of expression and dialogue used in our contemporary lives. Looking at technology in order to "overvalue" it, and make it the protagonist of the teaching process, meets extremisms that seek to praise only "the new", that which is external to a rural territory. This posture tends to bring more wear and tear than advancement in ATER interactions. In this sense, the effort to eradicate these types of positioning was much worked on in the pedagogical materials we are discussing here.

The act of teaching in rural territories requires from the technician-educator a commitment to the student. It is necessary to understand that there is no single way to teach everything to everyone and this requires adaptations in the paths. Traditional teaching methods can and should be combined with the media (videos, infographics, voice messages and text messages) belonging to teaching materials, seeking to develop all the pedagogical potential that interactional ways on the web provide. During teaching and learning activities, the educator will always present a responsive attitude towards the student, always urging him to perform the critical act[65] at the time of the pedagogical meeting, whether remote or in person, on the rural property, in the agricultural houses or elsewhere.

The technician-educator knows that teaching is an intentional action whereby the relationship and sharing of contents, produces knowledge and expresses affection[69] in the

65 (1987) Freire.

student. One way to explain affectivity[66] is using the dialogic method, used in the construction of pedagogical paths in a collaborative teaching-learning process, as in the case of the participatory Digital ATER methodology. When we unfold its constituent elements for teaching and learning[67] in the rural production environment, it can be noticed:

- **Intentionality**: in a comprehensive way, ATER's teaching processes will present the purpose of developing an environmentally and socially sustainable rural territory, with social equity and free from poverty. The improvement of the life of the rural producer, his family and employees in these aspects will lead to all stages of the didactic planning of an educational action.
- **Affectivity**: concerns the act of one subject to affect the other during teaching. The sharing of information and the joint construction of knowledge can directly interfere in the way of life of people in the countryside. When building new knowledge, the producer is affected by it, helping to shape his path in the relationships that occur in his life.
- **Didactic planning**: the technician-educator will always try to plan the didactic activities that will be used in the meeting with the rural producer, trying to answer some questions such as: will the meeting be remote or in person? What subjects will be worked on? Is it necessary to send any preparatory material before the meeting through electronic devices? Which didactic technique will be used at the time of the meeting: problematizing dialogues; expository lectures; or others? What pedagogical actions will be used

66 (2006) Clot.
67 (2021) Mill; Zanotto.

to support the act of teaching before, during and after the meetings? All these questions will be part of a temporal and sequential line of pedagogical meetings, linking the various acts of teaching and learning between technician and rural producer in the various moments in which they relate, inside and outside the rural property.

- **Construction and sharing of knowledge**: it will be a joint, non-hierarchical, and equipotent activity between technician-educators and people who live and work in the countryside. Each rural producer will learn whereby a unique interaction, as it presents a cognitive path that is to participate, a unique way of understanding and relating to the world. As far as possible, this educator seeks to get to know each producer in depth, to select and develop the best way to teach, choosing the most appropriate teaching paths. Each of these people will present singularities in terms of desires, needs, fears and questions, directly affecting the joint construction of knowledge in the field. These singularities can be classified and categorized, leading the educator to produce pedagogical actions closer to a particular group of producers. Therefore, the development of the path and contents of mediation by the technician-educator is fundamental for a meaningful and dialogic teaching to occur.

Figure 5 offers a flowchart of didactic procedures for the development of pedagogical actions[68] to be offered in the participatory work of Digital ATER. It shows a set of activities that are divided into three stages, aimed at meetings in the field between technician and rural producer, via WhatsApp

68 (2021ab) BRASIL-MAPA

or Telegram. The first stage is planning the content that will be shared and presents a set of tasks and activities related to details regarding: the form of the meeting (see didactic planning present in this topic); the selection of themes that will be worked on during the teaching; the choice of teaching materials that contain the selected topics; the preparation of the design of how the training will be, comparing it with the reality of each producer and rural territory; and the search to visualize how the didactic sequencing of the pedagogical actions will be during the meeting.

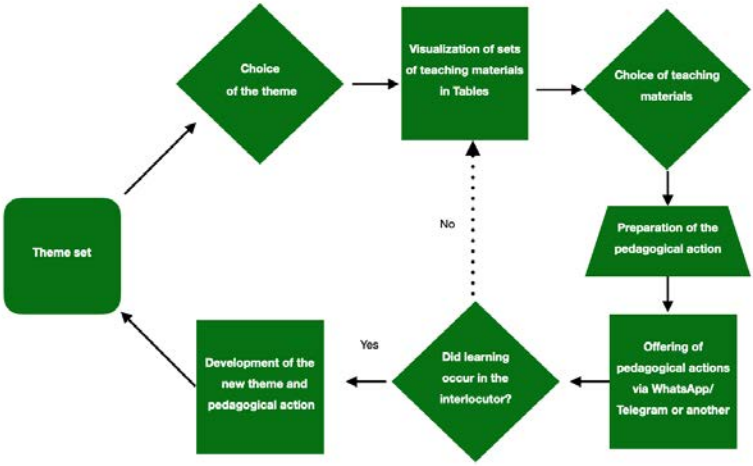


FIGURE 5 - Didactic referrals and development of pedagogical actions via WhatsApp/Telegram.
Source: BRAZIL-MAPA (2021ab)

The second stage is the organization of groups of students during teaching activities in the interactive

environment of WhatsApp or Telegram. At the beginning of the work, the technician-educator organizes the classes into groups. The application provides some alternative composition and frequency of interactions. The two most common forms of communication are: between just two subjects or in groups. The groups can present two configurations in relation to the possibilities of expressing the utterances and contents. The first would be a group where all members can interact; in the other, no form of communication is allowed. Each group presents a set of teaching possibilities for the educator. For example, the group that does not allow interactions can be used as a repository of the contents worked on in the pedagogical actions. In parallel, you can create another group with the same members to carry out interactions freely, such as clearing up doubts and even proposing new complementary content for your property or that of your colleagues. The group in which interaction is allowed can also be used to track learners' performance during the learning process. Managing the timing of sending messages to producers will depend on some factors. One of them is related to the productive routines on the rural property, such as harvesting and planting times, which are not the best times for interactions. However, a punctual contact via the web may not be an obstacle at this productive moment. Another factor would be the interval time between the sending of messages of the pedagogical actions, which will depend on some elements: such as the student's prior knowledge about the topic addressed; offering reinforcement activities such as exercises; the urgency of acquiring knowledge; as well as others.

The third and last step is the assessment of learning, when indicators can be observed in the group's interactions during the pedagogical action. There are some indications that the technician-educator can verify the intensity of the student's

learning, such as: verifying the internalization of technology in the producer's productive routines in the rural property; observe whether one producer teaches the other in the learning content; critically evaluate the contents, individually and collectively, both the old procedure and the introduction of the new technology in its rural property; measure the adaptations made by the producer for the introduction of new processes and products in their life and production routines, among other signs. Also, the internalization of the new technology in production processes may not happen, but this does not mean that the producer has not learned. He just decided that he didn't want to change for several reasons that could be cultural, economic, among others. At this moment of verification of the student's learning, it is important that the technician-educator asks his interlocutor for an evaluation of his pedagogical practice, analyzing his behavior, postures, and didactic chains, which he used during the pedagogical action. All these paths taken by the educator and the student in the meetings will be carried out in a collaborative way.

In recent years, all the advances in ICTs and their digital teaching-learning environments will not replace the physical presence of rural extensionists in the field, working with producers. ATER's services are moving towards a hybrid action, with the moment of in-person contact being important even when this technician is unaware of the producer's property. The technician-educator should assume his role as an advisor in the context of Participatory Digital ATER, helping the producer to relate to the high amount of information he receives every day via social networks. It will help you identify and select information that can really be positive for improving your production processes. This action of selecting information already occurred in ATER services in-person meetings in rural territories, but

they arrived in smaller volume and frequency through social networks and other means of communication (e.g., television and radio, magazines, booklets, among others). However, in this new educational context on the web, it is essential to teach the rural producer research techniques and verification of the veracity of the content that is interacting. So that he can identify the places to collect reliable information in this environment, where he can search for it and use it safely in his life. One of these activities would be done by the educator offering sets of electronic addresses on the web, thus guiding the student to manage their own learning in these places.

The production of knowledge will be carried out in a shared way by the technician-educator and by the people who live and work in the field. The educator, during his pedagogical practice, seeks the resources technologies that are offered to build a new productive reality together with producers, in a participatory process permeated by a critical view of life. The dialogic teaching-learning process in remote or in-person meetings will be based on aspirations, needs, desires, fears, fears, among other elements that are part of their productive routines and of the producer's life. At this pedagogical moment, the educator is expected to have a set of skills, knowledge, and procedures to be used in digital ATER, regardless of remote or in-person relationships, as can be seen in Figure 6[69].

69 (2021) Mill, Zanotto.

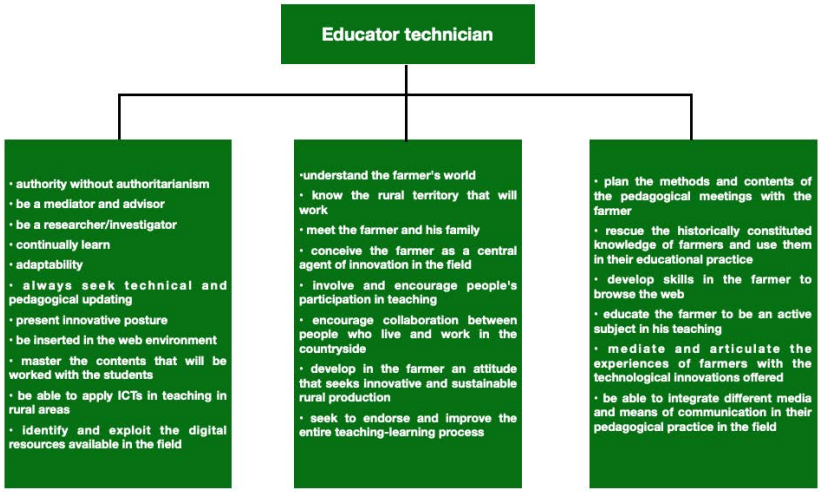


FIGURE 6 - Characteristics, skills and procedures expected from the dialogic technician-educator

Source: adapted from Mill and Zanotto (2021)

Both the technician-educator and the rural producer may raise several questions about the viability of Participatory Digital ATER during the stages of development, implementation and analysis of pedagogical actions and their results. For this they will be able to carry out reflections and present proposals for solutions for their rural territories. A set of questions that can be used to initiate these reflections would be:

- Who will train the technician-educator in the Participatory Digital ATER approach? What will be the teaching method? Who will educate the educator?
- Who will determine the referrals and pedagogical stages of Participatory Digital ATER to technician-educators? So that there is uniformity in the performance of all rural extensionists who make up an organization in this type of

teaching-learning in the field? Although we know that each rural territory is unique, unique.

- Dialogical actions tend to take longer and take more time from the technicians, as each situation implies a universe of knowledge and possible particular solutions. For example, an attempt is made to develop a didactic plan, seeking to develop a set of skills in the producer to surf the web, among other actions. How and by whom will the courses that bring digital literacy to the producer and their families be held? Will the technician-educators carry out these pedagogical activities? Will there be mobilized and sufficient technician-educators to carry out this work?
- In the Participatory Digital ATER methodology, the technician-educator can and will be encouraged to create their own material. Who will proofread and proofread this material?
- If the technician chooses not to be dialogic, for example, due to the high number of visits to rural producers he interacts with. Would it still be possible to use the Participatory Digital ATER pedagogical methodology in your educational processes?
- In the year 2021, how many of the organizations that provide services in rural territories are aligned with the methodologies proposed in Participatory Digital ATER? When observed their ways of working with producers in the field?
- How will technical educators be evaluated in an organization that wants to incorporate the practices proposed by Participatory Digital ATER? What will be your goals and qualitative and quantitative indicators for this new educational context? How many services will be provided

to the rural product? Is there any index that identifies the happiness of the producer and his family?

- For the development and application of Participatory Digital ATER in the field, will organizations have enough technical-educators and other technological resources to apply this new pedagogical methodology to some degree or in its entirety?

All these questions and their solutions go through the development of public policies aimed at a participatory Digital ATER in rural territories. Due to its scope of subjects, each one of these questions could be unfolded in several studies and works. This book seeks to help public managers in the formulation and application of public policies aimed at an ATER, which also uses digital communication environments in their services, in the productive routines and in the lives of people who live and work in the countryside. In the development of public policies aimed at bringing participatory Digital ATER, it should be clear that the producer will also be an active subject in the generation of knowledge produced in the digital environment of interaction. Its objective is to build a dialogic environment, where a permanent critical view of people is sought in relation to their productive routines and life. In WhatsApp groups, the technician-educator seeks to encourage the students to present correct technical proposals and referrals that differ from their suggestion. Both educator and student seek to be critical of their own actions at Participatory Digital ATER. In this pedagogical context, it is also up to the producer to play a leading role, for example, in the active search for new knowledge or sharing among peers, in some cases, making a joint effort to implement suggestions from the technician-educator, among other actions. Only through this active and critical posture will there be a process of expansion

of knowledge in the technician-educator and producer, who seek a rural territory that helps to fulfill the 17 goals of the UN Sustainable Development Goals.

CHAPTER 5 - WHEN A PARTICIPATORY DIGITAL ATER PROPOSAL OPENS A HORIZON OF POSSIBILITIES FOR NEW INTERACTIONS AT THE COUNTRYSIDE

The health crisis caused by Covid-19 further revealed the importance of rural territories in maintaining food and nutritional security for people living in cities. The teams of technical educators adapted their teaching resources to the new reality, even redoing much of what had already been built, rethinking the particularities of the field, but also the moment of crisis they were experiencing. To help protect people who live and work in the field against the pandemic, from the new coronavirus, eight books aimed at preventing Covid-19 were produced. In the development of these books, we sought to unfold the recommendations for preventing the new coronavirus, considering the activities and relationships experienced by people during their routines in the field, whether comprehensive or private, such as those applicable to swine farming and dairy farms.

The new coronavirus pandemic also caused an emergency in rural territories, which required an equally rapid action in which information adapted to their professional activities was developed and offered to rural extension workers and inspection

agents. We are referring not only to time, but also to seeking resources and time-limited planning. Pedagogical communication by Participatory Digital ATER for rural territories sought ways, types and paths, through electronic devices and communication programs, such as cell phones, computers and tablets, which were already used by producers and their families.

The WhatsApp electronic message application was chosen as a communicative path for the development and dissemination of pedagogical actions and its teaching materials for prevention to Covid-19 in rural territories. WhatsApp was already well known and used in rural areas, but the Pedagogical Action Development Teams (PADTs)[70] that developed the latest books also indicated Telegram as a communication alternative. This application presents a technological possibility that facilitates access to the history of conversations and content developed by the group. In addition to the apps, WhatsApp and Telegram, other digital interaction mechanisms used by rural producers, such as Facebook, Instagram, and YouTube, were also encouraged. The work involved not only the presentation of these tools, but mainly the help to the digital literacy of producers, including seeking to understand eventual rejections, by the producer, of some formats of teaching materials, which did not occur with significant frequency. However, it was a possible assumption for the group of researchers, professors, public servants, journalist, and musician who worked on the elaboration of each of the 12 books[71].

At the beginning of the work, in April 2020, with the formation of the initial PADT, the development of the first book began, the "Technical Operational Manual: Biosafety

70 This is the name of the multidisciplinary teams that developed the 12 books with the participatory ATER Digital pedagogical methodology.

71 (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil - MAPA; (2021) Ribeiro *et al*.

procedures for Covid-19 in meetings and production routines between extension technicians and rural farmers of swine"[72]. This publication already presented a set of teaching materials (voice messages and infographics) on the topic of preventing the new coronavirus. However, it was not clear to PADT how the pedagogical actions and their teaching materials in rural territories would be suggested. What would be the communication paths for the sending and ways of interacting messages and their contents through WhatsApp? Among the many questions, the main ones are:

- Would messages be sent in a block or separate?
- What are the ideal times for sending messages?
- How would the contents of the messages be chosen and linked?
- What kind of group on WhatsApp would be created for sending educational actions?
- Would the content sensitize rural producers, their families, and employees to prevent the disease?
- Could producers be motivated to share messages to other producers?
- How would teaching materials be used on other social networks (Facebook, Instagram, and YouTube) used by rural producers?

These and other questions permeated the work of PADT, which sought to develop didactic guidelines consistent with the initial proposal of a dialogic pedagogy that makes up the Participatory Digital ATER. It was in search of a reflective

72 (2020a) Zanella *et al.*

act permeated by the understanding of the reality lived and experienced in the field by members of the PADTs and specialized literature. In general, the interlocutors don´t have a greater understanding of the incompleteness of life that is shaped by the awareness of the new, which is always considered unfinished and in motion[73]. Thus, the reality of rural territories experienced by these educators preceded the construction of their theorization. Without going through the in-person path in the field, there is no participatory Digital ATER, nor a hybrid dialogical interactivity in the digital environments of teaching and physical encounter in rural territory.

The 12 books presented here comprise a teaching-learning methodology that employs the fundamentals of Participatory Digital ATER. As in the case of the development of activities aimed at rural territories, such as technical and managerial tasks and procedures of the One Health; environmental sustainability; law and citizenship; and people's credit and indebtedness. Constitutive elements of these issues, which should be present in productive systems and in people's lives, are lived and experienced jointly by the rural extension worker, inspection agent, rural producer, family members and employees. Other conditioning elements were also considered in the interactions by digital technologies in the field, as reported in previous chapters. All books were produced and released over the years 2020 and 2021, namely:

1. Operational technical manual: biosafety procedures for Covid-19 in meetings, in production routines between extension technicians and rural swine farmers (May 2020);

73 (2006) Bakhtin.

2. Technical operations manual: biosafety procedures for the prevention of Covid-19 in productive routines among technicians, extensionists and rural producers of pork (June 2020);
3. Technical Operational Manual: biosafety procedures to prevent contagion and spread Covid-19 for rural extension workers and inspection agents (August 2020);
4. Technical Operations Manual: Biosafety procedures for the prevention of contagion and propagation of Covid-19 aimed at rural extension workers and agricultural inspection agents (August 2020);
5. Dialogues for the prevention of Covid-19 in rural territories (October 2020);
6. Dialogues for the prevention of Covid-19 in rural territories (October 2020);
7. Biosafety procedures for the prevention of contagion and spread of Covid-19 to slaughterhouse employees (November 2020);
8. Dialogues to face Covid-19 in productive routines in dairy farms (April 2021);
9. Dialogs for Law and Citizenship in the Countryside (May 2021);
10. Dialogues for good practices in the use of veterinary products in animal production (July 2021);
11. Dialogues for the prevention of tropical race 4 of fusariosis in banana trees (July 2021);
12. Dialogs on Credit and Indebtedness (September 2021).

Technicians who work in rural territories, in direct contact with rural people, must be aware that they play an educator role, which reveals itself and becomes important in the most varied

forms, contents, moments and interactional means. Together with the students (producers, employees, and family members), the technician-educator plans - and whenever possible, develops with these groups of people - their referrals and pedagogical contents.

Table 1 shows the quantities of pedagogical actions that were developed for the 12 books, produced nine in Portuguese and three in Spanish. In all, 736 teaching materials were produced (infographics, posters, videos, text, and voice messages), 667 in Portuguese and 69 in Spanish.

Pedagogical Elements	Portuguese	Spanish
Books	9	3
Pedagogical Actions	**Portuguese**	**Spanish**
Voice Messsages	344	24
Infographics	118	27
Posters	133	15
Text Messages	60	3
Videos	12	---
Total of Pedagogical Actions	667	69

CHART 1 - Total of books and teaching materials developed for the promotion of health, citizenship, and law in the countryside.

Source: (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil - MAPA; (2021) Ribeiro *et al*.

We will now go on to detail the participatory digital teaching-learning proposal of ATER that were present in the series of 12 books produced.

APPENDIX – BOOK SERIES "DIALOGUES IN THE COUNTRYSIDE": ALL VOLUMES

BOOKS 1 AND 2

OPERATIONAL TECHNICAL MANUAL: BIOSAFETY PROCEDURES FOR COVID-19 IN MEETINGS IN PRODUCTIVE ROUTINES BETWEEN EXTENSION TECHNICIANS AND RURAL SWINE FARMERS

It was the book that started the development of the participative teaching-learning methodology of Digital ATER, being released in May 2020 with the title "Operational technical manual: biosafety procedures for Covid-19 in meetings in production routines between extension technicians and rural swine farmers"[74]. Soon after, in mid-June of the same year, its Spanish version was also made available[75] (Figure 7). The book was accompanied by a set of pedagogical support actions: 17 voice messages and five infographics. The work was divided into two parts. The first had contents, based on references from official bodies and scientific journals, relating to the historical moment and about the state of the art of the forms of contagion and prevention of Covid-19 in rural territories. Such information was directed to technician-educators with technical and university education, who worked in swine farming. The second part of the book offered voice message scripts and a set of infographics containing recommendations for the prevention of Covid-19, in

74 (2020a) Zanella *et al*.
75 (2020b) Zanella *et al*.

productive routines and in life, aimed at people who worked on swine farms and their families. A Spanish version of the book was made available to other countries in Latin America. The voicemail scripts, which are part of the book, were not recorded for this version.

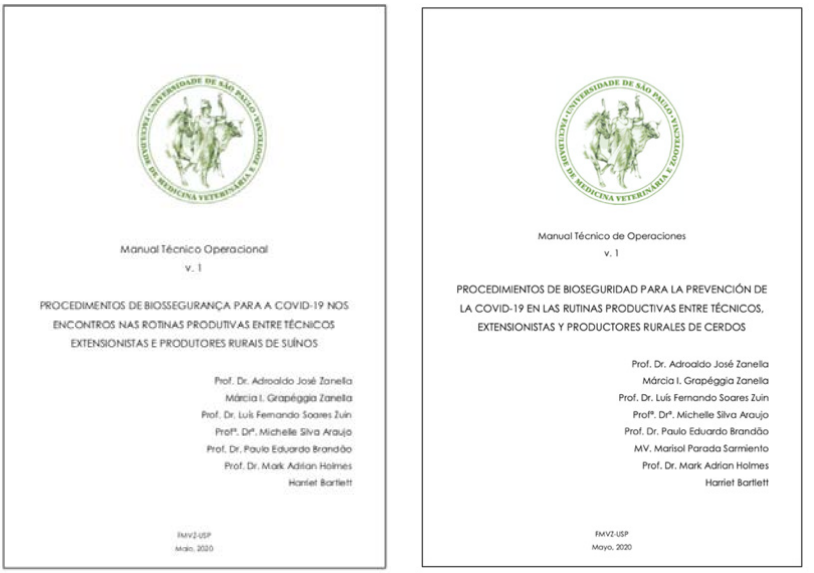


FIGURE 7 - Operational technical manuals for swine family farmers in Portuguese and Spanish
Source: Zanella et al. (2020ab)[76]

The voice messages were produced following a journalistic aesthetic, simulating a news shift, which sought to draw the listener's attention and alert people to the dangers of the new coronavirus. In their introduction, they exhibited a signature

76 Book's title: Technical Operational Manual v.1: biosafety procedures for Covid-19 in meetings in production routines with extension technicians and swine rural producers.

from the Faculty of Veterinary Medicine and Animal Science of the University of São Paulo, the institution that coordinated the publication. The duration of each voice message was an average of 2.5 minutes. At the end of the messages, there was a call to the content that would be dealt with in the next post. The messages had a direct instructional direction, such as: "you can't do..."; "you should do...". The contents of the messages were comprehensive, broad, offering the swine farmer a set of information related to their daily production and to other internal and external environments to the property and moments of their life. The aesthetics, contents, and directions for Covid-19 of voice messages are observed in the example of the script below, which describes the in-person contacts between people in the productive environment of the farm:

> **The Faculty of Veterinary Medicine and Animal Science of the University of São Paulo presents the "Biosafety Duty for Swine Farmers". Check out important tips to prevent the spread and spread of Covid-19 on your farm and property**. Today we are going to continue the subject of the entry of people into properties and farms. Let's talk about social distancing on farms. As we have already mentioned in another "Biosafety Duty", Coronavirus spreads through droplets of saliva suspended in the air, when coughing during speech and through breathing. When talking to other people, keep a minimum distance of 2 meters, wear a mask and do not shake hands, hug, or kiss on the cheek. Hello, farmer, the virus also infects objects. Do you remember that? Therefore, you should never share your drink! This is certainly the fastest way for you to get infected with the virus. Also, do not share food, cups, towels, cigarettes, cell phones and other personal effects. If contact occurs, these objects must be immediately

> sanitized with soap and water. Cell phones can be sanitized with 70% alcohol. Ask drivers and technicians to bring water bottles from home. Smokers should wash their hands before and after smoking. After smoking, the cigarette butt should be thrown away immediately. Farmer, during the visit, wash your hands frequently with soap and water or 70% alcohol gel. Try to solve your doubts remotely, using the phone, WhatsApp, and e-mail, thus reducing the need for technicians to visit your property. In the next Duty we will guide you about your external visits and explain how to go to the city. **This was the biosafety duty of the Faculty of Veterinary Medicine and Animal Science at the University of São Paulo, contributing to the health of the Brazilian swine farmer.**[77]

The infographics developed for this study formed a support for voice messages (Figure 8). The communicational methodological proposal to be used via WhatsApp, and other social networks, was to offer a voice message about the importance of wearing masks and, jointly or separately, an infographic could be sent to teach how to make a homemade mask. This communicational path was suggested because, by exposing the steps and measures to make a homemade mask through an infographic, the information became more efficient when offered through steps and measures, in a written text, when compared to the messages of voice, that these contents could be confusing for the interlocutor. At that time, infographics were more generic, they did not have an aesthetic and identifications focused on the field. At the time of writing the book, it was not clear how teaching materials would be sent through the interactional environment of WhatsApp. During its elaboration,

77 (2020a, p.39) Zanella *et al*. - Author's translation.

it was not possible to visualize how their pedagogical actions would be systematized in this communicational environment.

FIGURE 8 - Set of infographics offered in the manual for swine farmers
Source: Zanella et al. (2020a)

The Portuguese and Spanish versions of the book and their teaching materials can be viewed and downloaded respectively at the following electronic addresses:

- http://www.livrosabertos.sibi.usp.br/portaldelivrosUSP/catalog/book/485
- http://www.livrosabertos.sibi.usp.br/portaldelivrosUSP/catalog/book/489

BOOKS 3 AND 4

OPERATIONAL TECHNICAL MANUAL: BIOSAFETY PROCEDURES FOR THE PREVENTION OF CONTAGION AND PROPAGATION OF COVID-19 FOR RURAL EXTENSIONISTS AND SURVEILLANCE AGENTS

In the second stage of the pandemic, in August 2020, five months after its detection in Brazil, the second book "Operational Technical Manual: biosafety procedures to prevent contagion and spread of Covid-19 to rural extensionists and inspection agents"[78] was released, and also its Spanish version[79] (Figure 9). For the two books, a set of pedagogical actions (in Portuguese and in Spanish) was developed, which aimed to protect both the technical educators (rural extension workers and inspection agents) who worked in the field and the rural producers, families and employees of the Covid-19 pandemic. The contents and information were aimed at in-person meetings, which could take place both in production routines, on rural properties, as well as in the offices of these professionals in the city, a point that has always been considered critical for the contagion and transmission of the virus. It is worth emphasizing at this historical moment the leading role played by producers, of all sizes, in maintaining the population's supply and, therefore, the continuity of professional activities in the countryside throughout Latin America.

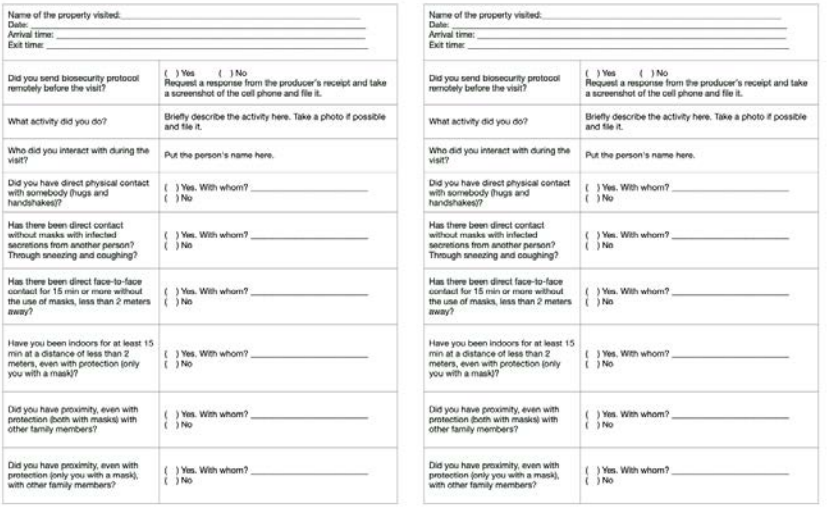
78 (2020a) Zuin *et al*.
79 (2020b) Zuin *et al*.

FIGURE 9 - Manuals in Portuguese and Spanish for Covid-19 prevention for rural extension workers and inspection agents
Source: Zuin et al. (2020ab)[80]

The book was divided into two parts. In the first, a description of the novelties that science brought to the fight against Covid-19 and, also, a series of procedures for the visit to the rural property by the technician, such as the mapping of the Covid-19 Critical Points of Contagion (P3C) in interactions on rural properties. The result of the P3C diagnosis would determine what would be the specific recommendations for the analyzed environment, aimed at choosing the biosafety procedures that would be used during the visits of extensionists and inspection agents to the rural producer. There was then, the development and offer of a biosafety protocol to be sent to the rural producer, being used during a meeting on his property and in the offices of these technician-educators in the cities. In addition to explaining how the visits would be carried

80 Book's title: Biosecurity procedures for prevention of contagion and spread of Covid-19 for rural extensionists and surveillance agents.

out, it also contained a proposal for two forms to document how the meeting occurred, in the field or in the city, with the rural extensionist or inspection agent. The information contained in these forms could be retrieved so that some elements related to the P3C experienced during the technician's visit to the producer's property could be verified, contributing to a second moment, if necessary, to unveil the versions of these people experienced in these meetings (Figure 10).



Name of the property visited: _____
Date: _____
Arrival time: _____
Exit time: _____

Did you send biosecurity protocol remotely before the visit?	( ) Yes ( ) No Request a response from the producer's receipt and take a screenshot of the cell phone and file it.
What activity did you do?	Briefly describe the activity here. Take a photo if possible and file it.
Who did you interact with during the visit?	Put the person's name here.
Did you have direct physical contact with somebody (hugs and handshakes)?	( ) Yes. With whom? _____ ( ) No
Has there been direct contact without masks with infected secretions from another person? Through sneezing and coughing?	( ) Yes. With whom? _____ ( ) No
Has there been direct face-to-face contact for 15 min or more without the use of masks, less than 2 meters away?	( ) Yes. With whom? _____ ( ) No
Have you been indoors for at least 15 min at a distance of less than 2 meters, even with protection (only you with a mask)?	( ) Yes. With whom? _____ ( ) No
Did you have proximity, even with protection (both with masks) with other family members?	( ) Yes. With whom? _____ ( ) No
Did you have proximity, even with protection (only you with a mask), with other family members?	( ) Yes. With whom? _____ ( ) No

Name of the property visited: _____
Date: _____
Arrival time: _____
Exit time: _____

Did you send biosecurity protocol remotely before the visit?	( ) Yes ( ) No Request a response from the producer's receipt and take a screenshot of the cell phone and file it.
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Has there been direct face-to-face contact for 15 min or more without the use of masks, less than 2 meters away?	( ) Yes. With whom? _____ ( ) No
Have you been indoors for at least 15 min at a distance of less than 2 meters, even with protection (only you with a mask)?	( ) Yes. With whom? _____ ( ) No
Did you have proximity, even with protection (both with masks) with other family members?	( ) Yes. With whom? _____ ( ) No
Did you have proximity, even with protection (only you with a mask), with other family members?	( ) Yes. With whom? _____ ( ) No

FIGURE 10 - Biosafety forms for documenting meetings in the field and in the city between rural extensionists/inspection agents and rural producer
Source: Zuin et al. (2020ab)

In the second part of the book, a pedagogical methodology of Participatory Digital ATER was made available to technical educators. This way of teaching and learning began to take on a more mature methodological outline, which was then defined. All infographics, voice messages and text scripts accompanied this new way of teaching and learning.

The teaching materials developed for the book in Portuguese were: 12 voice messages; three infographics and three text messages. The work translated into Spanish also kept the same teaching materials. The care related to biosafety in the meetings between these professionals and the rural producer in production routines were the focus of these materials produced. The voice messages had an average duration of 1.5 minutes, and were directed to technicians and rural producers, and were named (signature) "Bulletin for the Protection of Covid-19 in the Field". The free use of this material was clearly explained in the body of the book. Its contents presented a more colloquial and close language, distancing itself from the aesthetics used in the first manual, which was written in a journalistic style. We tried to develop another type of statement, which was not imperative and monological, but dialogical. There was no call for the subject that would be dealt with in the next voice message, giving more freedom to the technician-educator to make their own pedagogical path with their students. Nine voice messages were directed to technical educators. As can be seen, one of them suggests to these educators the forms, contents, and interactional paths for the use of messages and other pedagogical actions, which can be sent via the technician's WhatsApp to producers, their families, and employees:

> **Bulletin for the Protection of Covid-19 in the Field (06).** Hello, rural extensionist and inspection agent. WhatsApp is, of course, a very important tool for communication with rural producers. But, like any other technology, it's interesting to know how to use it efficiently. Sending long texts, videos, or audios longer than a minute, or photos that are difficult to download, instead of helping, hinder your interaction with the rural producer. Like you, producer has a lot of contacts on mobile; so,

> send messages first thing in the morning, around six o'clock. This way, you can ensure a faster viewing of your contact. Taking care of your health, of the producer and rural producer, you bring knowledge and security to the field.[81]

Three voice messages were also created for technical educators to communicate with rural producers. An example is the recording that clarifies the rural producer about the biosafety procedure, which would be carried out for the meeting in the technicians' offices in the cities. During the preparation of the messages, a compositional aesthetic called "Coffee and Cake" was adopted. The authors were instructed to imagine a meeting in the kitchen of the producer's house, with his family around him, talking, eating a piece of cake, and drinking a cup of coffee, during an afternoon at the end of the visit to the property. The messages were signed "A Good Chat Bulletin for the Protection of Covid-19 in the Countryside".

> **A Good Chat Bulletin for the Protection of Covid-19 in the Countryside (03) – Biosafety procedures for meeting rural producers/producers at the office of the rural extensionist/inspection agent in their organizations**. In this good prose bulletin, I'm going to talk to you about going to the extension worker's office. In these times of coronavirus, we need to avoid, as much as possible, going to the office, but sometimes we don't see another way. But it won't be possible to go unannounced. You need to call ahead, make an appointment, and go alone. You can't risk getting out there and meeting a bunch of people and having to wait around, right? So don't leave the house if you haven't arranged a

81 (2020a, p.64) Zuin *et al*. - Author's translation.

> right time. In the office, you and the extension worker/inspection agent must always keep the mask on, they cannot hug or shake hands. Once you arrive at the office and before leaving, you need to wash your hands with soap and water or use 70% alcohol gel. You must try everything you can not to use paper, because in addition to the coronavirus being able to stay there on paper, there is no way to clean it without spoiling what is written. Send documents by cell phone using WhatsApp. It's not difficult, but if you can't, ask for help from your household, for your children, for example. It´s better not to leave your house. Try to solve everything by phone or by WhatsApp! Let's take care of ourselves and soon we can gather to have a cup of coffee again![82]

The three text messages developed in this book are called the "Covid-19 Field Protection Report". They contained a series of recommendations for the meetings and a language was also sought that would unfold the technical information on prevention to Covid-19, in the productive routines and the life in rural areas. For example, the following message was intended to inform the biosafety procedures and protection equipment for rural producers to use during the technical visit or inspection on their property:

> **Report on Protection of Covid-19 in the Field: Biosafety equipment and procedures for technical assistance during the visit of the rural extensionist/inspection agent on the rural property.** Good morning producer and producer, I'm sending you this message with the procedures we should follow during a visit to your property. They are very important

82 (2020a, p.60) Zuin *et al*. - Author's translation.

to our protection against the new coronavirus. Are they:

• at the time of the meeting you must be wearing a mask. It can be the one you made yourself;

• we cannot have physical contact at any time during the visit, such as hugs and handshakes;

• we must be at least 2 meters away from each other;

• only you will have to welcome me. Other people should not attend the meeting, such as your wife and children;

• I cannot use your household items or the bathroom in your house;

• I can only use the facilities and bathrooms in the changing rooms of the farm or the production shed;

• I also must not accept any type of food you offer me;

• you must provide both of us with soap and water, so that, during the activity, we can wash our hands and forearms when it's necessary;

• after the activity performed, I must leave. I will only stay on your property if it´s really necessary;

These actions are important for us to remain healthy. Have a nice day, my dear rural friends[83].

Figure 11 presents the three infographics that were developed to support voice and text messages. The first two show biosafety procedures and techniques aimed at meetings on rural properties and in professionals' offices in cities. The

83 (2020a, p.67) Zuin *et al*. - Author's translation.

third presents a set of recommendations for personal hygiene and cleaning of equipment that were handled by the subjects during the visit. The infographics were developed to be read on the cell phone screen, but nothing prevented them from being printed and posted or even distributed to rural producers, always complying with biosafety regulations. In the infographics, an attempt was made to incorporate an aesthetic closer to rural producers with words and images that refer to the countryside, equipment, rural, among others. However, the diversity of genders and ages was not considered in them, and it may not have reached its full potential for dissemination and awareness, when offered to people who live and work in the countryside. Most Brazilian producers are aged between 45 and 65[84] years, drawings with figures were not offered for people of these ages.

FIGURE 11 - Infographics made available to extension workers and inspection agents for meetings in rural territories with producers

Source: Zuin et al. (2020a)

84 (2017) IBGE.

In the historical moment of the elaboration of this material, added to a methodological evolution of the previous proposal[85], a method of dissemination in the interactional environment of the WhatsApp application was suggested to the reader in a more detailed and systematic way, receiving the name of pedagogical actions. For the technician-educator, examples and possibilities of use and combinations of the three sets of teaching materials (voice messages, texts, and infographics) were offered. One of the suggestions for use reported a form of dissemination that mixed voice messages with infographics, illustrating their spoken referrals. It was also introduced in the messages, pedagogical actions, a short explanatory text, which explains to the interlocutor which contents are exposed and offered in the voice message and infographics. By the same didactic way, text messages could also be combined with infographics. Some examples of these interactions are illustrated in Figure 12.

FIGURE 12 - Ways to offer pedagogical actions to rural producers via WhatsApp
Source: Zuin et al. (2020a)

85 (2020a) Zanella *et al*.

In the book, ways to suggest sending the material were worked out, regarding the moment of the day when the producer would be more likely to see the pedagogical actions contained in the message. Thus, it was suggested that professionals working in the field should know the production and life routines of rural producers, their families, and employees. Another point raised was to use WhatsApp as a form of library (even if temporary), a place to file worked information. Technical assistance and inspection professionals could form mirror groups, in which interactions between participants would be blocked. The book is called "repository groups" and, for better ordering, only the administrator would have permission to post the contents. This is a form of use that can also be performed in this application. This communicational path was suggested because pedagogical actions are easily lost in the large volume of messages people receive during the day. The information in these "repository groups" could be easily accessed for another consultation when necessary for its use or sharing by the producer and technician-educator.

The books in their Portuguese and Spanish versions and their teaching materials can be viewed and downloaded respectively at this address:

- https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/cesesp/manual-tecnico-operacional

BOOKS 5 AND 6

DIALOGUES FOR THE PREVENTION OF COVID-19 IN RURAL TERRITORIES

The third book "Dialogues for the prevention of COVID-19 in rural territories" was launched in Portuguese[86] and Spanish[87] (Figure 13). The two works were made available to the public in October 2020, at a historic moment of the pandemic, in which it had already been in Brazil for seven months. The authors believed that basic information on ways to prevent Covid-19 contagion had already reached people who worked and lived in rural areas, but there was still a lack of a set of pedagogical actions and teaching materials that could raise awareness and make this public aware of to prevent the contagion of the new coronavirus. This hypothesis was raised because the authors had access to a survey by the Sustainable Rural Development Coordination of the State of São Paulo[88], which, in July 2020, provided information that most rural producers were protecting themselves against Covid-19 when they left home to go into town. They wore masks, sanitized their hands with alcohol gel, and maintained their social distance. However, this public was not prevented in relation to the disease when receiving visits to their properties, whether family members or service providers. Only a third of producers responded that they wore a mask, washed their hands, and kept their distance from people in these situations. Around 94% of rural producers still continued to invite visitors into their homes to have breakfast, eat and use the bathroom.

86 (2020c) Zuin *et al*.
87 (2020d) Zuin *et al*.
88 (2020) Grassi *et al*.

The book in Portuguese named "Dialogues for the prevention of Covid-19 in rural territories"[89] offered the technician-educator a set of teaching materials, including: 12 voice messages; 12 videos in Libras (Brazilian Sign Language)[90]; 20 infographics and 15 posters. In the book in Spanish, only the videos for people with hearing disabilities, who live in Latin American countries, were not produced, because each country has its own language for people with this disability. Therefore, for this work, two new teaching materials were added: the Libras videos and posters.

FIGURE 13 - "Dialogues for the prevention of Covid-19 in rural territories" in Portuguese and Spanish

Source: Zuin et al. (2020cd)

89 Zuin *et al.* (2020c).
90 Zuin *et al.* (2020d).

The voice messages were directed to rural producers and were called "Minute Field with Health fighting the Coronavirus!". They had an average duration of 50 seconds, with informal language, aimed at rural producers, their families, and employees. As in the previous book, the voice messages were not signed by any institution participating in the project, facilitating their reproduction by organizations and people interested in their use and dissemination. In the body of the book, it was also clear how the teaching materials could be used freely by individuals and organizations. Voice messages did not have pointers for the next one, facilitating the assembly of pedagogical actions by educators. Thus, educators could add them (posters, infographics, and videos) according to their criteria and needs. This was the main methodological approach related to the teaching-learning processes of this work: the possibility of the technician and people, who live and work in rural areas, being also directly responsible for the teaching processes for the prevention of Covid-19 in the field, making them aware of their roles as educators. Again, the compositional aesthetic named "Time for Chatting" was used in the development and recording of voice messages. This model can be seen in the script on the care of false news ("fake news") in one of the voice messages, provided below.

> **Hello, producers! We are "Minute Field with Health fighting the Coronavirus!".** I'm pretty sure you've already received messages on your WhatsApp that said they were urgent and that you had to send them to everyone you know right away! Have you already received it? And then you got so worried that you sent it to your friends and relatives without thinking it might be a lie, a rumor. This news is called fake news, that is, false news. The idea of someone

> who produces false news is the same – it makes you so worried that you don't read it properly and share it – so a lot of people will receive the same news and will also think it's true. So, pay close attention when you receive messages that start with CAUTION, or URGENT! Read it first, look at the name of the person who wrote it, if you've heard of this person and especially if you've seen this news in other places, such as on TV, radio, and the Internet. Think with me: if the news were true and that important, would it only be on your WhatsApp or Facebook? We need to be vigilant about corona virus, this disease is not over yet! When you take care of yourself, you take care of others too![91]

An innovation of this book was the elaboration of videos for the hearing-impaired audience based on voice message scripts. During its conception, some care was taken to include music and subtitles in the pieces, aiming to attract family members who listened and read. The idea, with this action, was that parents, children and other family members who listened and who did not listen could educate themselves in a joint and inclusive way, at the same time, seeking moments to integrate the largest number of people in the family in this way of teaching and learning (Figure 14).

91 (2020c, p.49) Zuin *et al*. - Author's translation.

FIGURE 14 - Videos in Libras (Brazilian Sign Language for deaf people) in the prevention of Covid-19 in rural territories

Source: Zuin et al. (2020c)

The aesthetics and shape of the infographics were also developed for WhatsApp and social networks. For this work, we sought to offer figures to meet the diversity of genders, ages and ethnicities that live and work in rural territories. Most of these pedagogical actions offered the interlocutor a single piece of information, involving in each one of them a concept, a theme of the subject discussed. This communication strategy was adopted to facilitate and highlight its submission through social networks. However, all these infographics could also be used as posters, being printed, placed on the walls of the farms, or distributed to other people who live and work in the field, advising on biosafety care in preventing the new coronavirus (Figure 15).

FIGURE 15 - Infographic for prevention of Covid-19 in rural territories
Source: Zuin et al. (2020c)

An amount of 15 posters (Figure 16) were made for this book that rural producers could print and place in visible places on their farms or other places, such as the offices of the associations. Thus, photos and short texts were used. They could also be distributed in physical form, but all biosafety precautions related to the contagion of the new coronavirus by paper should be adopted.

FIGURE 16 - Poster for the prevention of the new coronavirus in the field
Source: Zuin et al. (2020c)

For this book, the same communication chains were proposed for the pedagogical actions used in the previous ones[92] for WhatsApp and Telegram for rural producers, combining voice messages with infographics, videos, and posters. With these two new materials, videos and posters, technicians and other members of the organizations should be aware if they were to use these materials with producers. Educators should seek to know in advance the limitations of internet network coverage on rural properties with which they would interact, as well as the cell phone models that the producer and family members had, among other technical, operational, and interactional elements (Figure 17).

92 (2020ab) Zuin *et al*.; (2020ab) Zanella et al.

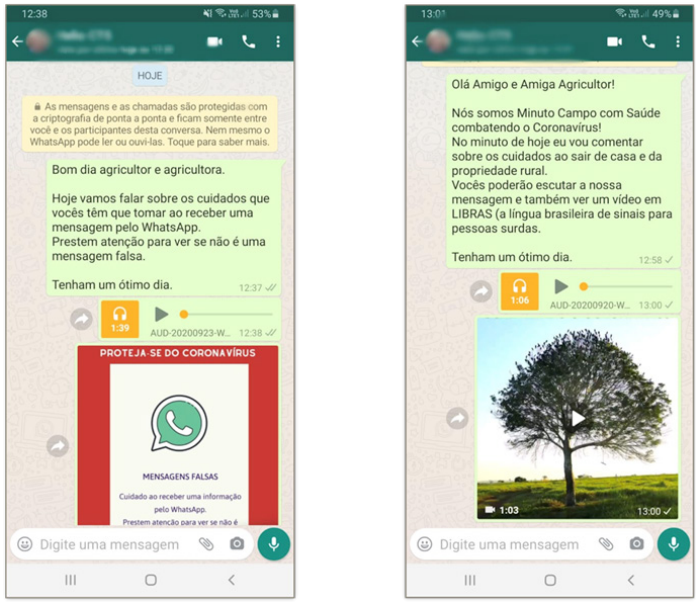

FIGURE 17 - Suggestions of communication paths for messages via WhatsApp.

Source: Zuin et al. (2020c)

For the book "Dialogues for the prevention of Covid-19 in rural territories"[93], the following quantities of teaching materials were produced: 12 voice messages; 20 infographics; 15 posters; and 12 videos. In all, 59 of these materials were developed. The book and the dialogic materials were transcribed into the Spanish language "Diálogos para la prevención de Covid-19 en territorios rurales", only the videos for people with hearing disabilities were not produced. Therefore, this book featured: 12 voice messages; 20 infographics and 15 posters[94]. Altogether it contained 47 pedagogical actions.

93 (2020c) Zuin *et al.*
94 (2020d) Zuin *et al.*

Books in Portuguese and Spanish versions and teaching materials can be viewed and downloaded at this electronic address:

- https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/cesesp/dialogos-para-prevencao-da-covid-19-nos-territorios-rurais

BOOK 7

BIOSAFETY PROCEDURES FOR CONTAGION AND PROPAGATION OF COVID-19 FOR REFRIGERATOR EMPLOYEES

The next book was offered in November 2020, aimed at preventing Covid-19 for people who work on the production lines of slaughterhouses. Entitled "Biosafety procedures for the contagion and propagation of Covid-19 for employees of slaughterhouses"[95] was published in Portuguese and its cover can be seen in Figure 18. The book was divided into two parts, one of them aimed at technical-educators, mainly slaughterhouse managers, with a more academic and technical language, and another with scripts of 16 voice messages recorded for different audiences.

95 (2020c) Zanella *et al.*

FIGURE 18 - Biosafety procedures for contagion and spread of Covid-19 for slaughterhouse employees

Source: Zanella et al. (2020c)[96]

Voice messages had an average of 70 seconds and were called "The Care WhatsApp". The informal aesthetics of the language used was also used in the making of their voice scripts. The idea was for these messages to be distributed via WhatsApp and Telegram groups so that they could be listened to during the production line employees' rest. At this time of pandemic of the new coronavirus in many meatpacking plants, cell phones were intensively used by people in these moments of rest and food. As they are just a set of voice messages and are also made available at a specific time in the working routine

96 Book's title: Biosecurity Procedures to Prevent the Contagion and Spread of Covid-19 for Slaughterhouse Employees.

of slaughterhouse employees, there was no attempt to develop a form of pedagogical action via WhatsApp and Telegram as in previous books. An example of a voice message script can be seen next, when raising awareness for the correct procedure aimed at preventing Covid-19, in collective housing of production line employees, what is common in some cities:

> **Hi! Here I am for another THE CARE WHATSAPP**. If you live in the company's collective houses, you've already seen that the business has changed for you too, right? Your bed should be two meters away from the other bed, the windows should have screens and stay open as long as possible to ventilate the place a lot and it won't turn over a lot of people stay in the room. You must wash and iron your bed and bath linen more often. What doesn't happen anymore is sharing your things, ok? No cigarette, no tea, no plate, no towels, nothing, nothing. Another super important thing. You need to take your shoes off before entering the dorm. If you come in with a contaminated shoe, it won't do any good to have done all the rest, right? And only go there after you've finished work and showered, okay? Then I'll come back with The Care WhatsApp! Take care there, I'm taking care of myself here![97]

The book and its voice messages can be viewed and downloaded at this email address:

- https://www.upf.br/FAMV/curso/medicina-veterinaria/podcasts-prevencao-ao-contagio-e-propagacao-da-covid-19-para-colaboradores-de-frigorificos

97 (2020c, p.52) Zanella *et al*. - Author's translation.

BOOK 8

DIALOGUES FOR COMBATING COVID-19 IN PRODUCTIVE ROUTINES IN DAIRY FARMS

The book "Dialogues for coping with Covid-19 in productive routines on dairy farms"[98] was offered to its audiences in April 2021, a time when a second wave of contamination occurred, both in urban areas and in the countryside. Unlike other production routines present in rural territories, a producer of bovine milk may have daily contact with people outside his property, interacting mainly with employees of the companies that will collect the result of his production (Figure 19).

The book was divided into three parts. The first offered the reader a theoretical approach to Covid-19, being written in an accessible way for people who live and work in the field. The second part included a set of pedagogical actions: 18 voice messages and 14 infographics aimed at preventing Covid-19 in the productive routines of dairy farms. The third part made available to the technician-educator a table with suggestions of themes for pedagogical actions and combinations of their teaching materials that would be treated with their audience.

98 (2021) Sousa *et al*.

FIGURE 19 - Book "Dialogues for coping with Covid-19 in productive routines on dairy farms"
Source: Sousa et al. (2021)

For example, Figure 20 shows this voice message and infographic script that describes some prevention procedures for Covid-19 at the time of milking on rural properties. The messages had an average duration of one minute.

> **MV9**. Hello dairy producer! It's time for our meeting: **COVID's Minute of confrontation at the dairy farm**. Another important aspect of production is the milking time, both to avoid contamination among people who are working. It is ideal that only one person is in the milking room, but in cases where this is not possible, the milking should be divided, so that each person is in a different space and away from their colleague. During milking, rubber boots and an apron must be worn, which must be sanitized and stored in places with a low risk

of contamination. Disposable gloves and masks should also be used. After the end of milking, all the plumbing and containers, in addition to other utensils used during the process, must be sanitized with 70% alcohol, soap and water or another sanitizer, as the virus survival time on these surfaces can be of several hours. Consult the equipment manual to find out which type of product should be used. Let's take care of ourselves and until our next Covid prevention meeting on your milk production![99]

FIGURE 20 - Infographic for prevention of Covid-19 in the productive routines of dairy farms
Source: Sousa et al. (2021)

As already reported, a table with suggestions for combinations of pedagogical actions and teaching materials

99 (2021, p.71) Sousa *et al.* - Author's translation.

was prepared and made available to the technician-educator, categorized with the emphasis to be given to disease prevention in the dairy farm (Figure 21).

Quadro 01 - Proposta de combinações para uso das ações pedagógicas

Tema	Ação Pedagógica	
	Mensagem de voz	Infográfico
Introdução à Covid-19	MV.01	---
Sintomas e Diagnósticos	MV.02	INF.14
Em casos de sintomas: Procure um médico	MV.03	INF.05
Transmissão da Covid-19: Use máscara	MV.04	INF.01
Os animais transmitem Covid-19?	MV.05	INF.08
Alimentos podem transmitir Covid-19?	MV.06	---
Recomendações gerais	MV.07	INF.02
Entrada e saída da propriedade	MV.08	INF.13
Momento da ordenha	MV.09	INF.12
Compartilhamento de banheiros	MV.10	---
Compartilhamento de refeitório	MV.11	INF.04
Visitas técnicas: Não dê apertos de mãos	MV.12	INF.07
Visitas técnicas: Higienize os equipamentos e ferramentas	MV.13	INF.09
Coleta do leite: Evite aglomerar	MV.14	INF.06
Moradores da propriedade que trabalham fora: Precauções	MV.15	INF.03
Uso de EPIs na ordenha	MV.16	INF.11
Uso de EPIs	MV.17	---
Importância de tomar a vacina	MV.18	INF.10

Fonte: propria autora

FIGURE 21 - Pedagogical framework offered to technical educators in rural territories

Source: Sousa et al. (2021)

Figure 22 shows a suggestion for sending via WhatsApp to rural milk producers regarding the importance of social distancing, in order to prevent the new coronavirus. The technician-educator could copy the text offered and send it to their students.

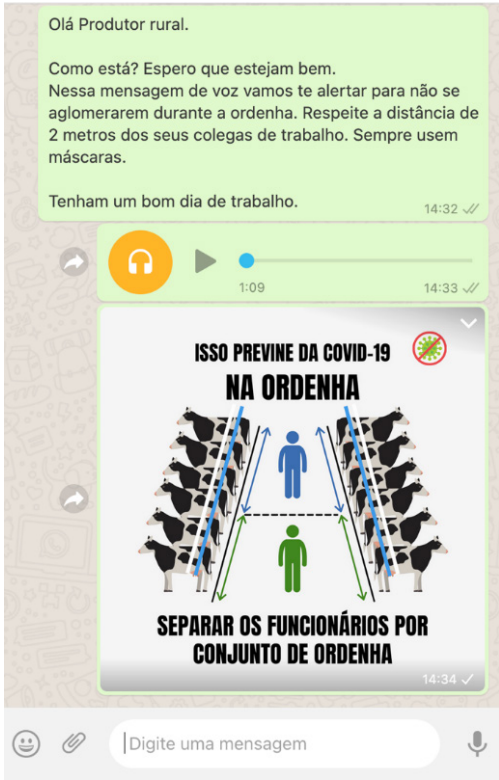

FIGURE 22 - Suggestion of communication paths for messages via WhatsApp

Source: Sousa et. al. (2021)

The book and its voice messages can be viewed and downloaded at the following email address:

- https://pedroejoaoeditores.com.br/site/dialogos-para-o-enfrentamento-da-covid-19-nas-rotinas-produtivas-em-granjas-leiteiras/

BOOK 9

DIALOGUES FOR LAW AND CITIZENSHIP IN THE FIELD

Aiming to expand the scope of the subjects dealt with by the Participatory Digital ATER's pedagogical methodology, in May 2021 the book "Dialogues for Law and Citizenship in Countryside"[100] was launched (Figure 23). Professors and students from three faculties of the University of São Paulo participated in this book: Faculty of Animal Science and Food Engineering; Faculty of Law of Ribeirão Preto; and Faculty of Economics, Administration and Accounting of Ribeirão Preto. The object of the book was to take basic knowledge about a set of subjects related to credit lines, taxes, rural retirement, among other topics; that would be useful for rural producers and their families linked to family farming. From a methodological point of view, it was divided into two parts. In the first one, it presented a participatory pedagogical methodology for Digital ATER, which would be used by the technician-educator with rural producers, as well as general recommendations on how to acquire rural credit. In the second part, the sets of teaching materials that were developed for this work were exposed.

100 (2021) Trentini *et al.*

FIGURE 23 - Book "Dialogues for Law and Citizenship in the Country"
Source: Trentini et al. (2021)

For this book, 31 voice messages, 30 posters and 31 infographics were developed. As can be seen in the voice script of the exemplified message, the definitions that characterize family farming are described. Along with it, it was suggested that a poster be sent (Figure 24) to value and bring together the content being worked on. An alternative would be to send an infographic along with the voice message, as in the case of Figure 25. The messages had an average duration of 1.5 minutes. The voice message script itself could be used as a text-based instruction to be sent via social networks.

> **MV1**. Hello, producers. **We are the "Law Minute and Citizenship in the Country"**. Today we are going to talk about whether you fit in as a rural family producer. This is very important because it gives access to some credit lines in banks with lower interest rates. But it has more benefits. First, only you, with

your wife, husband, and children, manage the property. It can also be together with cousins, uncles, and aunts, but it must have blood ties. Second: most of the work routine must be done by you and your family, but sometimes people can be hired for a short time. And lastly, you must own the machines, animals, seeds, everything that is necessary to produce the food or other product. You don't need to own the land; it can be leased. For more details, always look for a rural extensionist at the farmhouse or the manager of your bank or unions for more information. **Producers, when you know your rights, you produce with more security and opportunities**.[101]

FIGURE 24 - Example of poster in the book "Dialogues for Law and Citizenship in the Country"

Source: Trentini et al. (2021)

101 (2021, p.32) Trentini *et al.* - Author's translation.

FIGURE 25 - Example of an infographic in the book "Dialogues for Law and Citizenship in the Country"

Source: Trentini et al. (2021)

An innovative element added in this book was a table with suggestions for didactic referrals of pedagogical actions and their teaching materials. In each matrix where the teaching materials were exposed there was a link that the reader clicked and was directed to access them on a shared drive. In the book, there was also the option of downloading them, facilitating the assembly of their pedagogical actions.

In Figure 26, two suggestions for sending the book's pedagogical actions to rural producers are presented: two combined with voice messages, one with posters and the other with infographics, which could be used by educators.

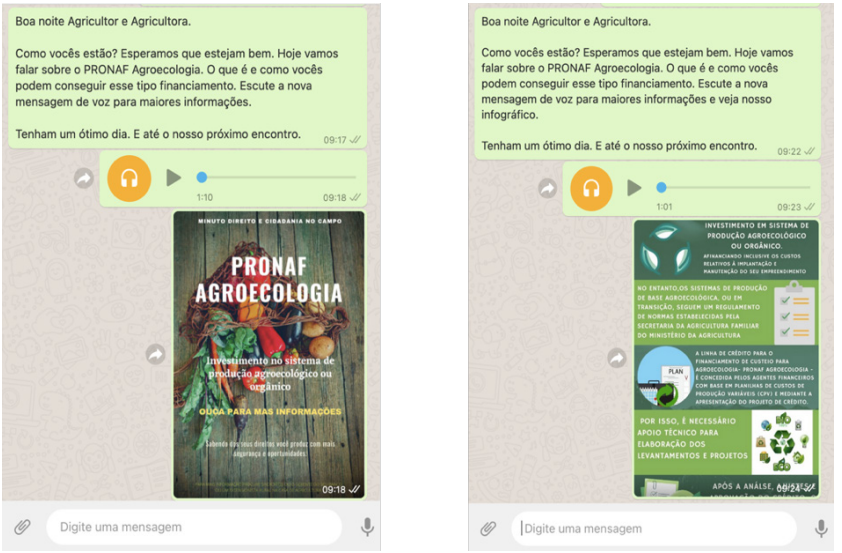

FIGURE 26 - Suggestions for sending pedagogical actions via WhatsApp
Source: Trentini et al. (2021)

The book and its voice messages can be viewed and downloaded at this email address:

- http://pae.direitorp.usp.br/dialogos-para-o-direito-e-cidadania-no-campo/

BOOK 10

DIALOGUES FOR GOOD PRACTICES IN THE USE OF VETERINARY PRODUCTS IN ANIMAL PRODUCTION

FIGURE 27 - Cover of the book "Dialogues for good practices in the use of veterinary products in animal production"
Source: BRAZIL-MAPA (2021a)

In July 2021, the book "Dialogues for good practices in the use of veterinary products in animal production"[102] was made available to the public. This book addressed a set of recommendations for the correct use of veterinary products, such as antiparasitic and antibiotics, in the productive routines of rural properties that have farm animals (Figure 27). The book sought to make people who live and work in the countryside aware of the correct use of these and other products, avoiding negative impacts on the environment, on their own health, on the consumers of their

102 (2021a) BRAZIL-MAPA.

products and on animal health. A study[103] reported a worrying situation: in Europe 33 thousand people die each year from infections caused by bacteria that are resistant to antibiotics.

For this book, 50 voice messages, 46 text messages, 9 infographics, 23 posters in A4 format and 19 posters in the size of the social network Instagram were produced to be shared via WhatsApp. All these media could be disseminated individually or together, as in previous books. Messages lasted an average of 1.5 minutes. The work began with the preparation of voice message scripts and, later, their contents were detailed into other teaching materials. The following is an example of voice messages:

> **MV1**- Hello rural producer and producer. All right with you? We are the MINUTE HEALTH FOR EVERYONE IN THE FIELD. Have you ever heard of One Health in the Field? It is when each one of us produces food following good agricultural practices, such as using veterinary products correctly. And today, people in cities are increasingly interested in knowing how the food they are buying was produced and valuing producers who take good care of animals, providing healthy and safe food. All of this is linked to everyday life in the countryside: from creation to care for the environment. After all, everything is connected and reflects the harmony of the health of man, animals, and nature. If we always seek balance in our activities, we avoid various diseases, such as the coronavirus that has already caused so much harm to humanity. So don't forget, friend and producer friend: One Health in the Field reflects on the quality of the food on our tables. This is a good reason for the appreciation of our agriculture. **Thinking about One Health and using veterinary products correctly, we**

103 (2019) Cassini *et al*.

> **collaborate to produce healthy food, and we take care of the health of people, animals, and nature. Ministry of Agriculture, Livestock and Supply. Federal government.**[104]

The text messages developed in this study had more details regarding the ways of correct use of veterinary products on farms. They had a more formal semantic construction and could be used to support voice messages. They could also be archived and accessed on the electronic devices of educators and learners. The following is an example of a text message:

> **MT2**. Hello, producers! We are the **MINUTE HEALTH FOR EVERYONE IN THE FIELD**. Did you know that misuse of medicines in farm animals can make microorganisms stronger, rather than killing them? When we use drugs wrongly, microorganisms learn how they work and start to develop resistance. We select super strong and drug resistant microorganisms. From then on, everything gets complicated... These microorganisms can be in meat, milk, eggs, fish, and honey and can cause illness in people. And when people need medicine like the ones you gave to animals, they won't work. Neither in people nor in animals. By following our recommendations, you will learn how to prevent the selection of resistant microorganisms, and the foods you so lovingly produce will be safer and healthier. We appreciate your support and partnership in the fight against drug misuse. **When we employ "One Health" in the field, we produce healthy food for everyone: animals, nature, and people. Ministry of Agriculture, Livestock and Supply. Federal government.**[105]

104 (2021a, p.45) BRAZIL-MAPA. - Author's translation.
105 (2021a, p.97) BRAZIL-MAPA. - Author's translation.

The graphic materials developed for this book, such as infographics and posters, would be used both on the walls of the farms, and in other production systems or organizations that support rural production. For all these graphic materials, voice messages were also suggested to be used as a support. They would also be sent individually, depending on the pedagogical strategy employed by the technician-educator (Figures 28 and 29).

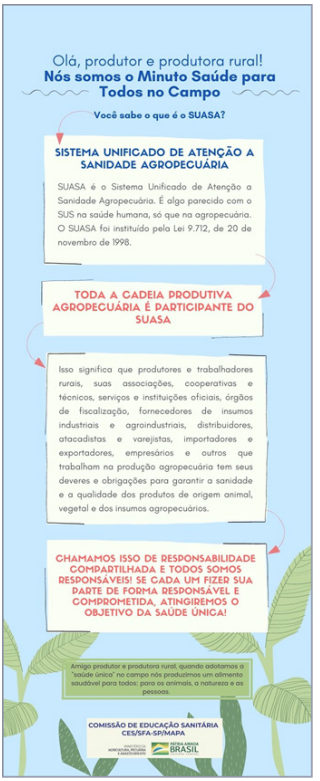

FIGURE 28 - Infographic reporting basic concepts of Suasa[106]
Source: BRAZIL-MAPA (2021a)

106 Unified Agricultural Health Care System

FIGURE 29 - Animal welfare and unique health poster
Source BRAZIL-MAPA (2021)

Another innovation available to educators were two sets of posters, in one of them recommended actions for the productive routine in the theme of the book. The other set showed photos and texts of various situations not recommended according to good practices in the use of veterinary products in the field (Figure 30).

FIGURE 30 - Posters about wrong and correct activities for the development of animal welfare and unique health on the rural property
Source: BRAZIL-MAPA (2021)

Figure 31 shows one of the tables offered in the book with the pedagogical actions, teaching materials, suggested combinations, and links to download them by theme. For this, the technician-educator would need to download the book and access the didactic materials that they would use in their pedagogical practice through these links in the tables. One of the innovations brought in this material was a set of four female voices that each recorded the same contents of the 50 messages, totaling 200 messages, featuring different voice timbres. The technician-educator could choose, among the voices, which would be the most suitable to use with the audience he would relate to.

Quadro 1 - Sugestões de combinações das ações pedagógicas para uso nos processos de ensino-aprendizagem nos territórios rurais.

Tema	Mensagem de Voz	Mensagem de Texto	Infográfico	Cartaz
Saúde Única	MV1,MV2, MV47	MT1, MT2, MT42, MT46	—	CART8, CART10, CART13
Os 5 somentes	MV3, MV4, MV5, MV6, MV7, MV8, MV9, MV10	MT3, MT4, MT5, MT6, MT7, MT8, MT9	—	CART1, CARTW/T15, CARTW/T16, CARTW/T17, CARTW/T18, CARTW/T19
Período de Carência	MV11, MV12, MV21	MT11, MT13, MT20	—	CART6, CART15
PAN-BR AGRO	MV13	MT12	INFO4	—
Resistência a antimicrobianos	—	MT38	INFO8	CART14
Resíduos dos Produtos nos Alimentos	MV2, MV14	MT14	INFO3	CART13, CART14
PNCRC	MV15	MT15	—	CART21
Consulte Médico Veterinário	MV16, MV17	MT16, MT17	INFO2	CART16
Uso correto, compra de medicamentos e boas práticas do uso dos produtos veterinários	MV17, MV18, MV19, MV20	MT10, MT17, MT18, MT19, MT20	INFO2, INFO7	CART6, CART9, CART22, CARTW/T1, CARTW/T3, CARTW/T4, CARTW/T5, CARTW/T7, CARTW/T8, CARTW/T9, CARTW/T11, CARTW/T12
Controle parasitário - Vermes	MV28, MV30, MV32, MV34	MT16, MT24, MT26, MT28, MT30	—	CART2, CART16, CART17, CART20

Fonte: adaptado de [19][20]

Figure 31 - Example of a Table with different pedagogical resources offered to educators

Source: BRAZIL-MAPA (2021a)

In this book, a flowchart was also offered to the technician-educator with a chain of pedagogical activities that describes the actions of planning, developing, applying, and verifying the contents worked with the students. Contents of books that would be used in the routines of routines of agricultural production. This flowchart would direct the preparation, by the educator, of their own pedagogical actions. It can be seen in Figure 5, in Chapter 4.

As in previous works, the pedagogical actions were suggested for dissemination in WhatsApp groups, Telegram groups or social networks, as shown in Figure 32.

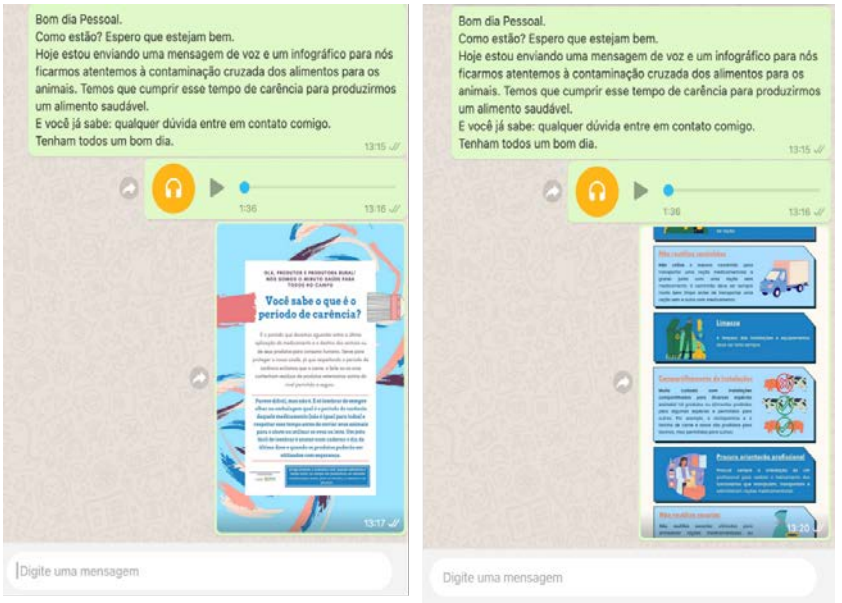

FIGURE 32 - Suggested ways to send educational actions via WhatsApp to rural producers, family members and employees
Source: BRAZIL-MAPA (2021a)

The book and its voice messages can be viewed and downloaded at this email address:

- https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/cesesp/publicacoes/livros/dialogos-para-boas-praticas-no-uso-de-produtos-veterinarios-na-producao-animal/view

BOOK 11

DIALOGUES FOR THE PREVENTION OF THE 4 TROPICAL RACES OF FUSARIOSIS IN BANANA TREES

The book "Dialogues for the prevention of Tropical Race 4 of Fusarium disease in banana plants"[107] (Figure 33) was written due to the increasingly imminent possibility of the arrival, in rural and urban Brazilian territories, of the Fusarium Race 4 Tropical fungus, which attacks banana plants, killing the plant and making its production impossible for more than 40 years[108] in the affected area. Several regions of Brazil can be significantly affected by this disease, such as Vale do Ribeira, located in the State of São Paulo. This location is considered the largest producer of bananas not only in the state, but also in the country. The arrival of this fungus in this region indicates a catastrophic scenario for the economy and well-being of the people who live and work in it. This book was launched at the same time as the book "Dialogues for good practices in the use of veterinary products in animal production"[109].

The objective of the book on combating the Fusarium Race 4 Tropical fungus was to provide information and raise awareness among people who live and work in rural areas to prevent and remain vigilant about the possibility of the arrival of this disease in the region. At the time of its release there was neither a pesticide nor a resistant banana variety to contain this pathogen. The path and pedagogical content developed in the

107 (2021b) BRASIL-MAPA.
108 (2018) BRASIL-MAPA.
109 (2021a) BRASIL-MAPA.

teaching materials were based on the book "Dialogues for the prevention of Covid-19 contagion in rural territories", since the scope of the two works was the same: to prevent the arrival of a pathogen in the countryside. The two contents, one on the preservation of human health and the other on plant health, are in line with the One Health precepts in rural territories reported by FAO-UN[110].

FIGURE 33 - Cover of the book "Dialogues for the prevention of Tropical Race 4 of Fusarium disease in banana plants"
Source: BRAZIL-MAPA (2021b)

For this book, 11 voice messages, 11 text messages, 9 infographics, 8 posters in A4 size and 11 posters in Instagram format were made. As reported, the aesthetics of books on protection against the new coronavirus were rescued, which sought to prevent a disease in the field, through referrals linked to biosafety, as can be seen in the didactic materials developed.

110 (2021) FAO-UN.

Starting with the voice message script shown below, they had an average duration of 1.5 minutes.

> **MV1**. Hi, producers. You are listening to **MINUTE VEGETABLE SANITY IN THE FIELD**. We are concerned about a new pest of banana plantations that could reach Brazil if we do not unite to fight it. This pest is called Tropical Fusarium of the Banana Race 4 or Foc R4T. It has, in addition to a difficult name, a superpower to damage the entire plant. It is a soil fungus that infects the plant from the bottom up and does not let water and nutrients circulate from the rhizome to the leaves, which will wither, turn yellow and, unfortunately, die. All varieties of bananas planted in Brazil can be greatly affected by this pest. It is, in fact, the new breed of a fungus, and it has already arrived in Colombia and Peru, countries close to Brazil. And since we don't have any resistant variety, our only alternative is to have access to quality information so as not to let this fungus affect our banana plantations. If you want to know more about this pest, see the Technical Announcement nº 149/2020 of Embrapa West Amazon, available on the Embrapa and MAPA websites! **Remember that Good Agricultural Practices are the beginning of prevention! For the Foc R4T there is no control, prevention is the solution! Ministry of Agriculture, Livestock and Supply. Federal government.**[111]

Once again, the text messages could be used to support voice messages or graphic materials. For example, the text below reports the importance of not bringing any plant seedlings and

111 (2021b, p.43) BRAZIL-MAPA. - Author's translation.

handicrafts made with banana leaves from other countries. The fungus could be on these products.

> **MT2** - Hello, producers. We are the Agricultural Defense bringing important information to you at **MINUTE SANIDADE VEGETAL IN THE FIELD**. The topic of the moment is the prevention of Tropical Race 4 of the Fusarium of the Banana tree. A pest that does not occur in Brazil, but is destroying banana plantations in Southeast Asia, Africa, and the Middle East. Unfortunately, this new breed of fungus is approaching us, it has already arrived in Colombia and Peru. We need to prevent their entry into our country and our properties, adopting some preventive measures. After all, good agricultural practices are the beginning of prevention! If you travel to any of these countries, do not visit the banana plantations and do not bring ornamental plants or handicrafts made from banana straw. It is forbidden to bring banana seedlings from these countries to Brazil. If you have visited a banana plantation, do not return with the shoes used during the visit. Throw away! They will bring the fungus contaminated soil to your property. All the clothes you wore on the trip must be washed thoroughly before returning to Brazil. Race 4 of this fungus is powerful, remaining alive for over 40 years in soil and on the surface of other materials. **You can make all the difference. It is necessary to know the problem to be able to fight. Now that you know and recognize the dangers of Foc R4T for banana plantations, do your job! We are not going to let this fungus reach Brazil. For Foc R4T there is no control, prevention is the solution! Ministry of Agriculture, Livestock and Supply. Federal government.**[112]

112 (2021b, p.56) BRAZIL-MAPA. - Author's translation.

The infographic is a didactic tool that concentrates, in a linked way, a set of subjects, as shown in Figure 34. In this didactic material, a search is made through various questions, which could be made by rural producers, exposing the details of this disease in a combined form of pictures and text. This teaching material could be sent via social media and messaging apps, as well as being printed and placed on the walls of the buildings on rural properties and ATER organizations.

FIGURE 34 - Infographic to be sent via social networks
Source: BRAZIL-MAPA (2021b)

The last pedagogical action developed for this book were two types of posters: one in A4 format and the other aimed at the size of the social network Instagram. Both could be printed and placed on the walls of sheds on rural properties, cooperatives, associations, and agencies of ATER. Sending through WhatsApp allowed the content to be exposed directly to the producer, highlighting the theme heard by the voice message (Figures 35 and 36).

FIGURE 35 - A4 format poster to be used on the walls of sheds in the field, unions, associations and ATER

Source: BRAZIL-MAPA (2021b)

FIGURE 36 - Poster in layout optimized for both Instagram and WhatsApp environments
Source: BRAZIL-MAPA (2021b)

For this book, a table was also proposed containing the access links of suggestions, for the technician-educators, of sets of pedagogical actions and their teaching materials, such as infographics, posters, text, and voice messages (Figure 37).

Quadro 1 - Sugestões de combinações de ações pedagógicas e materiais didáticos para uso nos processos de ensino-aprendizagem nos territórios rurais.

Tema	Mensagem de Voz	Mensagem de Texto	Infográfico	Cartaz
Conhecendo a Raça 4 Tropical da Fusariose da bananeira	MV1	MT1	INFO1	CART5, CARTW/T1, CARTW/T8
Medidas preventivas para viagens ao exterior	MV2	MT2	INFO1	CART1
A importância de comprar somente mudas com RENASEM	MV3	MT3	INFO2	CART2, CARTW/T3, CARTW/T9
O solo como fonte de contaminação	MV4	MT4	INFO3	CART3, CART4
A importância de comprar somente mudas com PTV	MV5	MT5	INFO4	CARTW/T5
Ações preventivas pelo MAPA	MV6	MT6	INFO5	CARTW/T6

Fonte: adaptado de [13][14]

FIGURE 37 - Example of Pedagogical Framework offered in the book for use by educators
Source: BRAZIL-MAPA (2021b)

Instant electronic messaging applications, such as WhatsApp, continued to be the main means of dissemination for pedagogical actions and their teaching materials. This can be seen in Figures 38 and 39, where four ways of suggesting the sending of teaching materials are exposed:

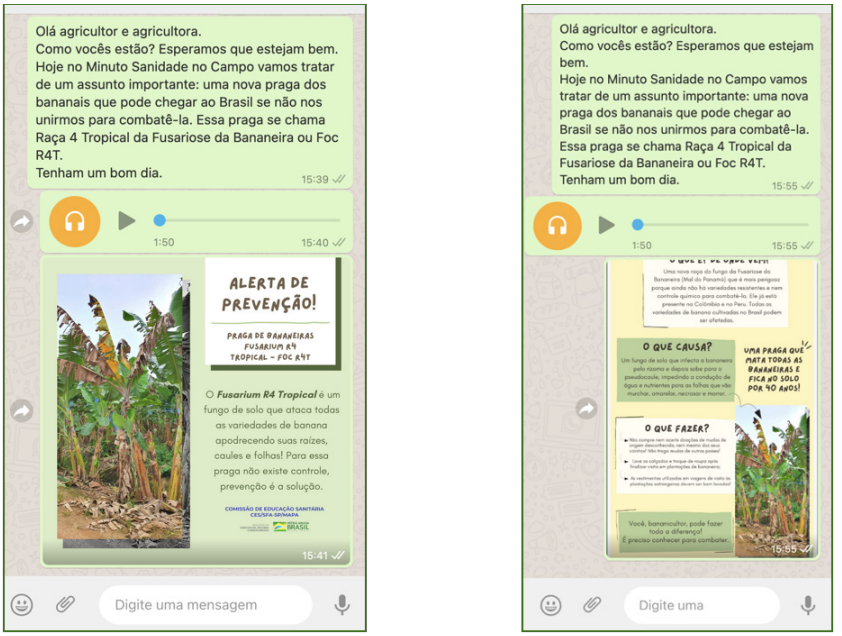

FIGURE 38 - Suggestions on how to send, via WhatsApp, the media for educational actions to rural producers, family members and employees.
Source: BRAZIL-MAPA (2021b)

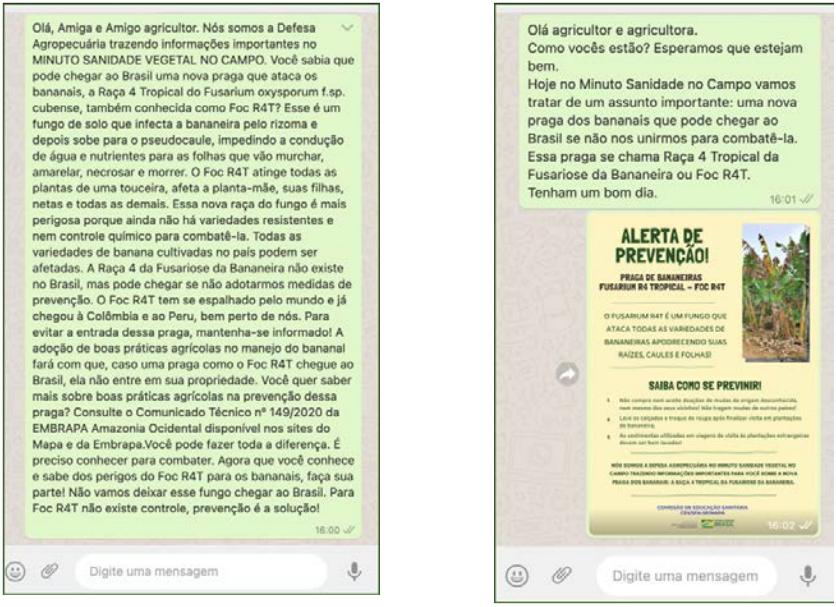

FIGURE 39 - Suggestions for ways to send, via WhatsApp, pedagogical actions to rural producers, family members and employees
Source: BRAZIL-MAPA (2021b)

The book and its voice messages can be viewed and downloaded at this email address:

- https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/cesesp/publicacoes/livros/dialogos-prevencao-da-fusariose-em-bananeiras/view

BOOK 12

DIALOGUES ON CREDIT AND DEBT

The last book released was the "Dialogues on Credit and Indebtedness"[113] (Figure 40), and this work is part of the first work done in partnership with professors from the Faculty of Law and Faculty of Economics and Administration, both belonging to the University of São Paulo, Ribeirão Preto campus. The first book produced jointly was "Dialogues for Law and Citizenship in the Country"[114].

In this new book, the authors considered that the subject "credits and indebtedness" was of collective interest for all people living in rural and urban spaces, but especially for retired people and pensioners. This choice of public took place because 60% of the volume of contracting of one of the payroll-deductible credit modalities is carried out by them[115]. Of course, other audiences would also benefit from the information contained in the book. The purpose of the book was to inform people of the impacts on their lives and wealth of borrowing money and the consequences of not being able to repay it. For this purpose, sets of teaching materials were made in which the rights that people have in this type of transaction were informed, with a view to protecting their assets and quality of life. As can be seen on the cover of the book in Figure 42, it was developed in partnership with the Indebtedness Support Program of the University of São Paulo (PAE-USP). This group is linked to the Provost of Culture

113 (2021) Ribeiro *et al.*
114 (2021) Trentini et al.
115 (2021) Brazilian Central Bank.

and Extension of the Faculty of Law of Ribeirão Preto and has the goal of offering legal counseling services for indebted people.

FIGURE 40 - Cover of the book "Dialogues on credit and indebtedness"[116]
Source: Ribeiro et al. (2021)

For this book, 27 voice messages were developed with the aim of educating the interlocutor on the ways to acquire credit and their rights during this process. A new strategy was to introduce, before signing the message "We are the Indebtedness Support Program of the University of São Paulo", the topic that would be addressed "Hello, do you have debts or are you looking for credit?". The book's authors believed that this would draw the interlocutor's attention to listen to the rest of the message, which lasted around 1 min.

> **MV1**. Hi, do you have debt or are you looking for credit? **We are the Indebtedness Support Program of the University of São Paulo**. In

116 Author's translation.

this message we are going to talk about personal credit. Did you know that personal credit is a loan that does not need collateral? The amount of interest you will pay is calculated based on the financial movement in your bank account. But it can also be a hit at the agency that will lend you the money. The interest rate varies a lot between banks, and it can happen that the same bank has different values, ranging from 0.86% to 26% per month. Therefore, before hiring, research alternatives with lower interest rates, such as those found in credit unions. Knowing your rights is the first step to protecting your assets. Avoid debt.[117]

Supporting voice messages, 27 posters were produced in Instagram format and 27 infographics, as shown in Figures 41 and 42.

FIGURE 41 - Poster on the theme of the payroll loan in the format of Instagram to send via WhatsApp or Telegram
Source: Ribeiro et al. (2021)

117 2021, p.27) Ribeiro *et al*. - Author's translation.

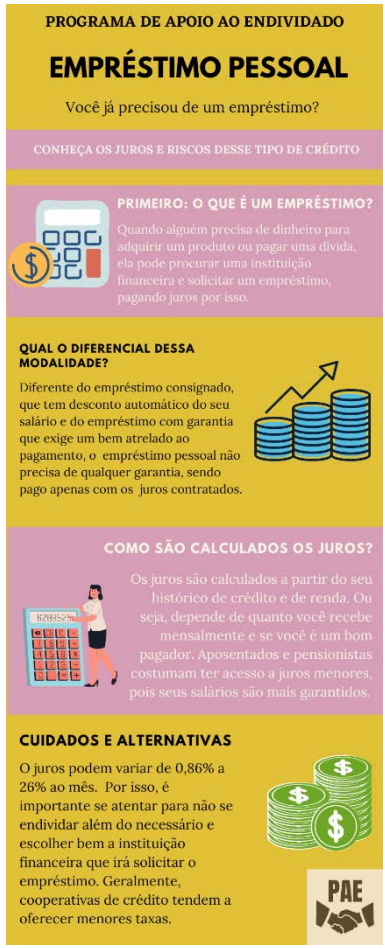

FIGURE 42 - Infographic that helps in understanding the basic information on the characterization of family farming for Pronaf

Source: Ribeiro et al. (2021)

In this book, educators were also offered a table categorized by themes and resources, to be combined according to their application contexts (Figure 43).

Quadro 1 - Propostas de combinações de ações pedagógicas e materiais didáticos para uso nos processos de ensino-aprendizagem na cidade e campo.

TEMA	MENSAGENS DE VOZ	CARTAZES	INFOGRAFICOS
1. CRÉDITO PESSOAL	MV.1- ÁUDIO CRÉDITO PESSOAL	Cartaz 1 - Crédito Pessoal.png	Infográfico 1 - Crédito Pessoal.png
2. CUSTO EFETIVO TOTAL	MV.2 - ÁUDIO CUSTO EFETIVO TOTAL	Cartaz 2 - Custo Efetivo Total.png	Infográfico 2 - Custo Efetivo Total.jpg
3.CRÉDITO CONSIGNADO	MV.3 - ÁUDIO CRÉDITO CONSIGNADO	Cartaz 3 - Crédito Consignado.png	Infográfico 3 - Crédito Consignado.jpg
4. EMPRÉSTIMO COM BEM EM GARANTIA	MV.4 - ÁUDIO EMPRÉSTIMO COM BEM EM GARANTIA	Cartaz 4 - Empréstimo com bem em garantia.png	Infográfico 4 - Empréstimo com bem em garantia.jpg
5. FINANCIAMENTOS	MV.5 - ÁUDIO FINANCIAMENTOS	Cartaz 5 - Financiamentos.png	Infográfico 5 - Financiamentos.jpg
6.ALTERNATIVAS DE FINANCIAMENTOS PARA PEQUENOS EMPRESÁRIOS	MV.6 - ÁUDIO ALTERNATIVAS DE FINANCIAMENTOS	Cartaz 6 - Alternativas de financiamentos para pequenos empresários.png	Infográfico 6 - Alternativas para pequenos empresários.jpg
7.CHEQUE ESPECIAL	MV.7 - ÁUDIO CHEQUE ESPECIAL	Cartaz 7 - Cheque Especial.png	Infográfico 7 - Cheque Especial.jpg
8. ROTATIVO E PARCELADO DO CARTÃO DE CRÉDITO	MV.8 - ÁUDIO ROTATIVO E PARCELADO DO CARTÃO	Cartaz 8 - Rotativo e Parcelado do Cartão.png	Infográfico 8 - Rotativo e parcelado do cartão.jpg
9.IMPENHORABILIDADE DE BENS	MV.9 - ÁUDIO IMPENHORABILIDADE DE BENS	Cartaz 9 - Impenhorabilidade de bens.png	Infográfico 9 - Impenhorabilidade de bens.jpg

Fonte: adaptado de [4][5]

19

FIGURE 43 - Example of a table with proposed themes for the pedagogical actions and their teaching materials[118]
Source: Ribeiro et al. (2021)

Similarly, to previous books, teaching materials were produced to be sent via WhatsApp and Telegram messaging apps, via social networks and also via radio, as in the case of voice messages (Figure 44).

118 The content of this figure will not be translated as it refers to particular financial terms of the Brazilian financial system and because they are complex to translate.

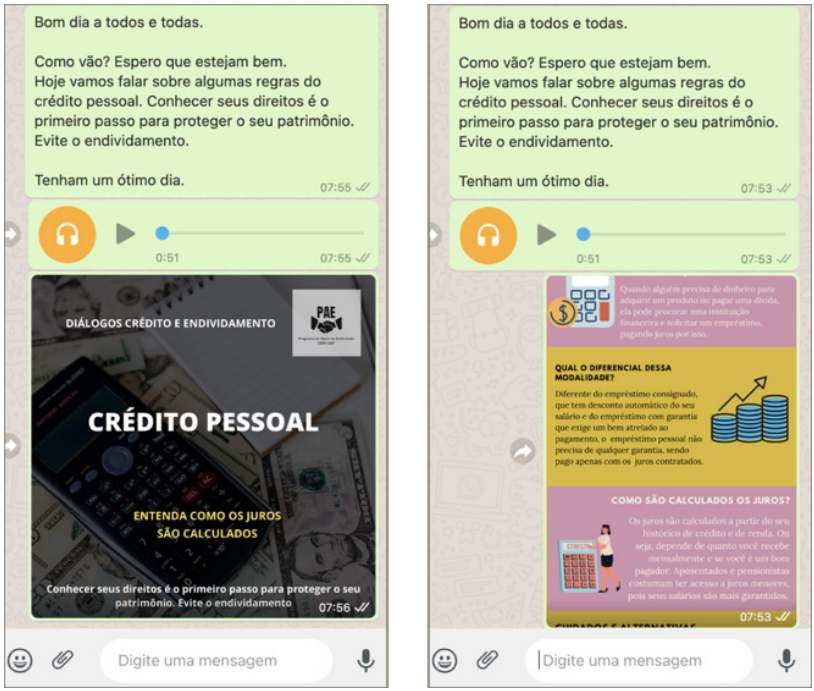

FIGURE 44 - Suggestions for sending pedagogical actions and their teaching materials via WhatsApp application.
Source: Ribeiro et al. (2021)

The book and its voice messages can be viewed and downloaded at this email address:

- http://pae.direitorp.usp.br/livro-dialogos-sobre-credito-e-endividamento/

CHAPTER 6 - METHODOLOGICAL AND PROCEDURAL PATHS FOLLOWED BY THE GROUP OF PEDAGOGICAL ACTIONS DEVELOPMENT IN THE DEVELOPMENT OF BOOKS

The development of the 12 books[119] and all the pedagogical actions was only possible because of a group of people with multidisciplinary backgrounds, who made up the Pedagogical Action Development Teams (PADTs). People who brought to the work looks, knowledge and positions that complemented each other in the production of materials. During the production of the books, each subject offered the group an experience, a reflection, contributing and complementing the work of the other, sometimes bringing together and, at other times, distancing the meanings and senses of each content developed. The teams were made up of professors from Brazilian and international universities and colleges, who work in the technical areas of animal and plant production, transmissible diseases, applied social sciences, pedagogy, and journalism. We also have the participation of researchers and Embrapa employees, who, in addition to investigating the technical and managerial aspects of

119 (2020abcd) Zuin *et al*; (2020abc) Zanella *et al*; (2021) Sousa *et al*; (2021) Trentini *et al*; (2021ab) Brasil - MAPA; (2021) Ribeiro *et al*.

rural production, offer extension programs for the socioeconomic development of rural bovine milk producers. In making the books, we also had as partners, different groups of public servants who work in the inspection of agricultural products in the countryside and in national and foreign agribusiness.

The making of all books by their PADTs followed similar trajectories, systematized in three stages: planning, development and dissemination of books, their pedagogical actions and teaching materials, as can be seen in Figure 45.

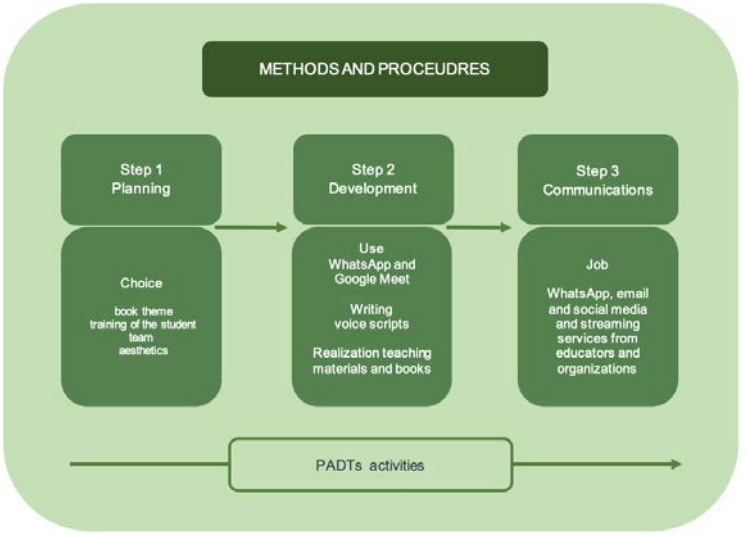

FIGURE 45 - Steps, methods and procedures used by PADTs to produce the books and teaching materials

Source: the authors.

Step 1
Planning

Broadly, in all 12 works made, the first planning activity began with the definition of the theme of the book, the groups of students we wanted to interact with and the aesthetics that would be chosen. The definition of the students' audience is important to delimit what would be the contents present in the teaching materials, which are produced in the second stage, that of development. In the first book, swine farmers and their families were the selected audience. In the second, rural extension workers and inspection agents, who did not stop going into the field with the arrival of the Covid-19 pandemic. In the following book "Dialogues for the prevention of Covid-19 in rural territories", all people who live and work in the countryside were covered. Two other books focused on biosafety for the new coronavirus in the work of employees in the production lines of the slaughterhouses and dairy plants. In the work launched below, aspects related to law and citizenship in the countryside were addressed. In the next two books released by MAPA, people who work in the field were once again sought to foster care in the use of veterinary products in animal production and also in the prevention of a new disease in banana plantations. The developments in both scenarios can be significantly negative for One Health in rural territories. The last book made available spoke about the dangers to the lives and assets of people contracting credit and becoming indebted.

Although the recommendations on the prevention of Covid-19 are similar (social distancing, use of masks and hand and surface hygiene), an attempt was made, in the books, to contextualize these guidelines for the routines of people in various productive systems in the field and refrigerators. The

theme described in the works acquired a more particular and dialogic look, comparing its contents with the actions and activities carried out by the selected audiences.

The aesthetics used in the construction of the pedagogical actions sought to bring the theme closer to the audience that each book contemplated. The Pedagogical Action Development Teams sought to insert elements in the figures and sentences of the teaching materials. This pedagogical path was chosen so that each audience could identify with the media offered, increasing the possibilities for subjects to fully interact with them. With the definition of the theme and audience, it was possible to form the Pedagogical Action Development Teams for each book. For this, people with skills that complemented each other during the execution of the work were selected.

In the last activity of this stage, an email was made for each book, and its respective virtual drive was used to store the pedagogical materials produced. The drive is a synchronized storage location for files, which can be downloaded with the author's permission. In the last four books released, a drive was created for each one, serving as a backup and dissemination of teaching materials. This resource is essential for the provision of teaching materials that are displayed in the tables that suggest the pedagogical actions of each book to educators.

Step 2
Development

All work involving the production of books was carried out remotely between the members of the PADTS. For team communication, two applications were used: Google Meet and WhatsApp. Each had a goal. The first, Google Meet, was used

to hold meetings with the entire group, especially during the planning stage. At this time, the members of Pedagogical Action Development Teams were introduced and known, starting the work of the first stage, selecting, and delimiting the themes and contents of the teaching materials that would be developed. The other application, WhatsApp, was used in the most frequent, daily communications between Pedagogical Action Development Teams members. A unique group for each book was created in this app. In the work routines, this application shared studies, news and information that served as the basis for the collective construction of pedagogical actions and their teaching materials (voice messages, text, posters, videos, and infographics). At a later stage of the production of these media, they were made available to the group to be analyzed and corrected and, if applicable, proposed new directions. The agility in the production of books, pedagogical actions and teaching materials was only possible using these instantaneous communication technologies.

All pedagogical actions and teaching materials began with the development of voice message scripts. For this, the Google Docs application was used, which allowed collective and dialogic constructions of the texts. An author wrote about another author's text, without their identification. It was proposed to the members of the Pedagogical Action Development Teams that the text belonged to everyone, without the need to always justify the decisions that led to changes and choices of content. For this discussion of content selections and proposals for new directions for teaching materials, the WhatsApp group was used, when necessary. Due to the originality of the proposal, the voice message scripts were made with a variety of constructions of utterances, some more formal and others more colloquial. Generally, voice message scripts had a first version written by technicians (veterinarians, agronomists, zootechnicians, among

others). This version received a rereading by a journalist, who sought to make it more accessible, colloquial. Afterwards, they were submitted again to the technicians, aiming at their validation in terms of scientific rigor. Only later were the messages destined for recording, when the background music that contributed to the proposal and themes of the books was chosen. There are several sites on the web that offer free music for jobs, which have also been made available free of charge. The messages from the voice scripts developed by the technicians were used as texts, to be used as a complement to the audios, sent via social networks or applications such as WhatsApp. The activity of preparing the voice scripts was the one that took the longest to be carried out, probably because the people who made up the Pedagogical Action Development Teams did not know each other and were also unaware of remote work technologies and the contents of the topic in its entirety. In the beginning, the work was like assembling a "puzzle" game.

With the utterances of the voice messages ready, the contents were deployed in the development of other teaching materials, such as infographics and posters. In some books, posters were produced in different layouts according to their placement. All teaching materials would be aligned in terms of content, to be used jointly and in a complementary manner when distributed to selected audiences. With the material ready, the distribution of books, teaching activities and teaching materials began.

Step 3
Communication

In the stage of communication and dissemination of the material, three communication paths were used, through WhatsApp, by email and through social networks, mainly of technicians who work in the field, throughout Latin America. They were also publicized through lectures at technical events (workshops) and radio calls.

At first, in these remote interaction sites, a brief text was made available, explaining the proposal of the books and their contents, and a link where the book, suggestions for pedagogical actions and teaching materials could be downloaded for free.

In a second moment, mainly in the last four works, the Pedagogical Action Development Teams understood that the book could be a "pedagogical tool". The teaching materials would be viewed and downloaded from the book through links and suggestion tables, allowing educators to work on their contents in the field. The Pedagogical Action Development Teams found it a good didactic path to offer the contents of the books in this way, facilitating the composition of pedagogical actions by educators in rural territories. In some books, voice messages were also made available via a streaming service such as Spotify.

The dissemination of the materials sought to bring people closer together with the objective of not only getting informed about the issues dealt with, but also seeking to raise awareness among the interlocutors and, thus, acting to change their reality.

CONCLUSION

The set of 12 books released over the years 2020 and 2021 was responsible for developing the Participatory Digital ATER pedagogical methodology, aimed at people who live and work in the countryside. The construction and offer of this methodology are necessary for the work in rural territories to seek the joint elaboration of productive environments that advocate the fulfillment of the goals of the 17 Sustainable Development Goals of the UN and of the One Health related to the countryside.

The application in productive routines of a participatory Digital ATER in rural territories, including that of other Latin American countries, where these publications have arrived, will depend on a set of dialogic interactions that have several constitutive elements. These elements are related to the forms, contents and paths that run through the relationships of people who live and work in the countryside. The educator seeks to be aware that remote communication with these people requires a series of care and reflections. In the proposal of this book, a series of questions are suggested for the technician-educator to answer, which contemplate the four dimensions of Digital ATER: pedagogical, inclusion, technical and interactional. Once its elements are defined, only then can solid and meaningful pedagogical bonds be built with the people who will interact in the field.

Thinking, developing, and implementing pedagogical actions with people in rural areas are activities that will be carried out together with them. In a collective and dialogic way, the Participatory Digital ATER will constitute an interactional path for a dialogic teaching-learning methodology, to be used remotely and in person with people in rural territories. The intention and choice for the dialogic posture of the technician-educator, in the field, reveal the various paths and contents of the dialogues that occur during the dialogue with the producers.

In the encounter during the dialogue, in person or remotely, in a synchronous or asynchronous time, it is expected that there is in teaching both a consensus and a contradictory sense and meaning. There is the role of the educator in mediating these voices to obtain a new balance. Remotely, care and planning with these interactions is important, according to the fundamentals presented throughout this book.

A "new rural" is being built every day in the countryside, among the people and organizations who live and work there, always receiving information from the most varied sources. It is up to the technician-educator to help the rural producer in the action of choosing these contents, guiding him. For this, he will need to know and win the producer's trust, a relationship that is only built in a dialogic way and over time. The paths of interactions can change over the course of a coexistence, from in-person to digital, from a short conversation to WhatsApp. But the needs, apprehensions, fears, and dreams will always be present in the dialogue between the technician-educator and the rural producer. With this perspective, an attempt was made here to bring the senses and meanings between these people together, with the aim of building a rural territory with social justice and that is also environmentally and socioeconomically sustainable.

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ANNEXES

ANNEX 1 – Book series "Dialogues in the countryside": texts translated from the figures on the 12 volumes

FIGURE 8 - Set of infographics offered in the manual for swine farmers, p.

Banner 1:

How to make a homemade mask to protect yourself from the coronavirus:

- Choose the right fabric: the recommended fabrics for homemade masks are, in order of decreasing ability to filter viral particles: vacuum bag fabric, cotton, cotton fabric, and antimicrobial fabric pillowcases.
- Sew or glue: with two pieces of fabric of 25 cm x 15 cm, place them one on top of the other and sew or use fabric glue. On the larger side, fold in 0.5 cm. From the smaller side, fold the mask hem 1 cm inwards. After that, sew the ends of the hem, remembering to leave space for the straps.
- Make the straps: make the straps using rubber bands or pieces of fabric. Place them inside the side hems that were sewn. Tie the ends of the elastics tightly.

Banner 2:

- Using masks, you reduce the probability of contamination of Covid-19: very high, high, medium and low.

Banner 3:

- Use PPE: Personal Protective Equipment;
- Some PPE may differ depending on the position of the worker? R: Boots; Helmets; Gloves; Overalls; Glasses and Mask;
- The importance of using PPE: PPE is important to protect individual professionals, reducing any type of threat or risk to the worker.

FIGURE 11 - Infographics made available to extension workers and inspection agents for meetings in rural territories with producers, pg. XX

Banner 1:

Meeting on the farm: Only the rural producer will find the extensionist/inspection agent. Other people, such as wives and children, cannot be together:

- Distance 2m; Wash your hands before and after the visit; Do not accept any drinks. - Would you like a cup of coffee? - Not. Thank you very much!

Banner 2:

Farmer meeting with rural extensionist or inspection agent:

- You have to come alone. Don't bring anyone to our meeting.
- The visit must be canceled if one of us presents any symptoms that indicate the disease.
- We have to wash our hands or pass alcohol gel or liquid 70% before and after the visit.

Banner 3:

Biosecurity procedure for after the visit or inspection of the rural extensionist or inspection agent on the farmer's property:

- Tools and equipment used in the visit must be cleaned with soap and water, cloth with 70% alcohol or a mixture of 7 tablespoons of bleach to 1 liter of water. Always consult the equipment manual to perform the cleaning correctly.
- Discard all waste (still wearing gloves and mask). Then remove the gloves, wash your hands and remove the mask by the straps.
- If the mask is disposable, throw it in the trash in a plastic bag. If it's cloth, keep it in a bag and wash it at home. Wash your hands again.

FIGURE 12 - Ways to offer pedagogical actions to rural producers via WhatsApp, pg. XX.

Banner 1:

- Good morning rural producer
- I'm sending you a set of recommendations so that our meeting on your property is safe from contagion to the coronavirus. If you don't follow the recommendations, I won't be able to go to your property to help you. Please follow the instructions.
- Have a good day.
- And see you soon.
- Extensionist or inspection agent cannot be with other people, such as wives and children.

Banner 2:

Good morning, farmer. I hope you and your family are healthy. If you want to meet me at my office in the city, we'll have to be careful. Please pay attention:

- You must arrange a time with me before going to my office. I have to prepare myself to meet you. You can call me or use WhatsApp.
- You have to come alone. This is important to reduce the risk of people getting contaminated.
- When you arrive, you and I will wash our hands or pass alcohol in gel 70%.
- Both of us will have to wear a mask during the entire time of our meeting.

- In no way we can hug and shake hands, from the moment you arrive and also when you leave.
- At our farewell, we will both wash our hands or pass 70% alcohol gel.
- Let's try to use sheets of paper as little as possible, because the virus can stay on it. I will send the documents to your WhatsApp. Ask your wife and children for help. I'll wait for you in my office, but only if it's really necessary.
- You have to come alone.
- Don't bring anyone to our meeting.
- Distance 2m; The visit must be canceled if one of us has any symptoms suggestive of illness.

FIGURE 15 - Infographic for prevention of Covid-19 in rural territories, p.

Protect yourself from coronavirus:

- Keep physical distance
- As long as there is no vaccine for this disease, we need to keep the distance from people (at least 2 meters) and also always avoid agglomerations, both inside and outside your property.

FIGURE 16 - Poster for the prevention of the new coronavirus in the field, pg. XX

Ways of contagion of covid-19:

- The second way we can catch the coronavirus is by touching contaminated surfaces, such as tools, tables, agricultural implements, among others. Imagine: a

person contaminated by the virus sneezing or coughing on top of a tool.

- Right after that you get this tool to work and then you scratch your nose or put your hand over your mouth. At that moment you can get infected.
- The coronavirus can be active, ready to contaminate you for up to three days on plastic and stainless-steel surfaces. On cardboard it can stay for a whole day.
- That's why it's important to clean objects and always wash your hands when we're working with other people in the same place.
- And we should also stay at least 2 meters away from these people.
- Print and paste in a visible place.

FIGURE 17 - Suggestions of communication paths for messages via WhatsApp, p.

Banner 1:

- Messages and calls are protected with end-to-end encryption and are only between you and the participants in this conversation. Not even WhatsApp can read or hear them. Tap to learn more;
- Good morning farmer;
- Today we are going to talk about the care you have to take when receiving a message on WhatsApp. Pay attention to see if it is not a fake message.
- Have a good day;
- Protect yourself from coronavirus;

- Fake messages;
- Be careful when receiving information by WhatsApp pay attention to see if it is not;
- Type a message.

Banner 2:

- Hello, farmer friend;
- We are Minute Field with Health fighting the coronavirus. Today I will comment on the care when leaving the house and the rural property. You will be able to listen to our message and also watch a video in LIBRAS (The Brazilian Sign Language for deaf people);
- Have a great day;
- Type a message.

FIGURE 20 - Infographic for prevention of Covid-19 in the productive routines of dairy farms, pg. XX.

- This prevents Covid-19 in milking
- Separating employees by milking set

FIGURE 21 - Pedagogical framework offered to technical educators in rural, p.

Column 1:

Theme:

- Introduction to Covid-19
- Symptoms and diagnoses

- In case of symptoms: See a doctor
- Covid-19 transmission: wear a mask
- Do animals transmit Covid-19?
- General recommendations
- Entry and exit from the property
- Milking time
- Shared bathrooms
- Sharing cafeterias
- Technical visits: No handshakes
- Technical visits: Sanitize equipment and tools
- Milk collection from milk: Avoid crowding
- Residents of the property who work outside: Precautions
- Use of PPE during milking
- Use of PPE
- Importance of getting the vaccine

Column 2:

Pedagogical Action:

- Voice Message
- Infographic

FIGURE 22 - Suggestion of communication paths for messages via WhatsApp, p.

Text Message:

- Hello farmer.
- How are you? I hope you're all right. In this voice message we will warn you not to crowd during milking.

Respect the distance of 2m from your co-workers. Always wear masks.

- Have a nice day at work.

Infographic:

- This prevents Covid-19 in milking;
- Separating employees by milking set.

FIGURE 24 - Example of poster in the book "Dialogues for Law and Citizenship in the Country", p.

- Minute law and citizenship in the field.
- You fit as a rural producer of family agriculture?
- Depends on the family structure, organization…
- Listen and learn more knowing your rights you produce more security and opportunity.
- For more information, look for unions or your bank manager or a rural extensionist at the agricultural house.

FIGURE 25 - Example of an infographic in the book "Dialogues for Law and Citizenship in the Country", pg. XX.

- Minute law and citizenship in the field
- Family farming concept used for pronaf
- Knowing your rights, you produce with more security and opportunities.
- Know the family structure. What is considered family for Pronaf? First, just you with your wife, husband, and

kids, who run the property. It can also be together with cousins, uncles, and aunts, but it has to be blood ties.

- Can you hire someone? Most of the work should be done by you and your family, but sometimes short-term hires can be made.
- The characterization of rural and family producers depends on control and management. they have to own the machines, animals, seeds, whatever is needed to produce the food or other product.
- This framework entitles you to lower interest benefits on financing!
- Is it necessary to own the land? no. ownership is not a mandatory title for pronaf. may be a squatter, tenant, partner or concessionaire of the national agrarian reform program.
- For more details always look for a rural extensionist at the farmhouse or manager of your bank or unions. Farmer, knowing your rights, you produce with more security and opportunities.
- Sources: Law no. 11326/2006 and law 6746/79, Arts 4, 5, 11. 49 and 50 of the land statute (Law no. 4504 of november 30, 1964)

FIGURE 26 - Suggestions for sending pedagogical actions via WhatsApp, pg. XX.

Banner 1:

Text messenger:

- Good evening, farmer.

- How are you? We hope you are well. Today we are going to talk about pronaf Agroecology. What is it? How can you get this type of funding? Listen to the new voice message for more information. Have a great day and see you in our next meeting.

Infographic:

- Minute right and citizenship in the field
- Pronaf agroecology
- Investment in agroecological or organic production system
- Listen for more information
- Knowing your rights, you produce with more security and opportunities.

Banner 2:

Text messenger:

- Good evening, farmer.
- How are you? We hope you are well. Today we are going to talk about PRONAF Agroecology. What is it? How can you get this type of funding? Listen to the new voice message for more information and view our infographic.
- Have a great day and see you in our next meeting.

Infographic:

- Investment in agroecological or organic production system

- Including financing the costs related to the implementation and maintenance of your enterprise
- However, production systems based on agroecology, or in transition, follow a set of rules established by the department of family agriculture of the ministry of agriculture.
- The line of credit for financing the cost of agroecology - Pronaf agroecology - is granted by financial agents based on spreadsheets of Variable Production Costs (vpc) and upon presentation of the credit project.
- Therefore, technical support is necessary for the preparation of surveys and projects.
- After analysis...

FIGURE 28 - Infographic reporting basic concepts of Suasa, p.

- Hello, farmer! We are Health Minute for Everyone in the countryside
- Do you know what SUASA is? Unified Agricultural Health Care System
- SUASA is the Unified Agricultural Health Care System. It is something similar to the SUS in human health, but in agriculture. SUASA was established by Law Nº 9712 of November 20, 1998.
- The entire agricultural production chain participates in Suasa.
- This means that rural producers and workers, their associations, cooperatives and technicians, official services and institutions, inspection bodies, suppliers of industrial and agro-industrial inputs, distributors, wholesalers and retailers, importers and exporters,

entrepreneurs and others who work in agricultural production, have their duties and obligations to guarantee the health and quality of products of animal and plant origin and agricultural inputs.

- We call this shared responsibility and we are all responsible! if everyone does their part in a responsible and committed way, we will achieve unique health goals!
- Dear rural producer, when we adopt the unique health in the countryside, we produce healthy food for everyone: for animals, nature, and people.
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 29 - Animal welfare and unique health poster, p.

- Hello, farmer! We are Health Minute for Everyone in the countryside
- Did you know that when you guarantee the well-being of animals, you are also improving the quality of livestock products and our own health?
- It's like a chain of good things, where one thing leads to another... When we meet the needs of animals, facilitating their adaptation to the production environment and improving the health of the herd, the animals' stress is reduced and the need for medicines, as well.
- As a result, we have better quality products and all this is related to lower product disposal, lower economic losses for the entire production chain and lower risk of antimicrobial resistance.

- And there's more! Research shows that where there is a greater degree of animal welfare, keepers work more satisfied, directly improving unique health.
- Dear rural producer, when we adopt the unique health in the countryside, we produce healthy food for everyone: for animals, nature, and people.
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 30 - Posters about wrong and correct activities for the development of animal welfare and unique health on the rural property, p.

Banner 1:

- This is not a good practice to use veterinary products!
- Dirty environment with little natural light.
- Animals can get sicker.
- Wrong practice.
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

Banner 2:

- This is a good practice of using veterinary products!
- Animals in freedom are less stressed and sick.
- Correct practice.

- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

Figure 31 - Example of a Table with different pedagogical resources offered to educators, pg. XX.

- Table 1 - Suggestions for combinations of pedagogical actions for use in teaching-learning processes in rural territories

Column 1

- Theme
- Unique health
- The five only
- Grace period
- PAN-BR AGRO
- Resistance and antimicrobials
- Residues from products in food
- PNCRC
- Consult a veterinarian
- Correct use, purchase of medication and good practices in the use of veterinary products
- Parasitic control – Worms

Column 2

- Voice Message

Column 3

- Text Message

Column 4

- Infographic

Column 5

- Banner

FIGURE 32 - Suggested ways to send educational actions via WhatsApp to rural producers, family members and employees, p.

Banner 1

Text Message:

- Good morning, everyone!
- How are you? I hope you're all right.
- Today I'm sending a voicemail and an infographic for you to be aware of cross-contamination in animal feed. We have to fulfill this grace period to produce heal,thy food.
- And, you already know, any questions, please contact me.
- I wish you all a good day.

Infographic:

- Hello, farmer.
- We are Health Minute for Everyone in the field
- Do you know what the grace period is?
- It is the period that we must wait between the last application of the drug and the destination of the animals or their products for human consumption. It serves to protect our health as, respecting the grace period, we prevent meat, milk, or eggs from containing residues of veterinary products above the permitted and safe level.
- It seems difficult, but it is not. Just remember to always look on the packaging for the grace period for that medication (it is not the same for all products) and respect this time before sending your animals to slaughter or using eggs or milk.
- An easy way to remember is to write down in a notebook the day of the last dose and when the products can be used safely.
- Dear rural producer, when we adopt the unique health in the countryside, we produce healthy food for everyone: for animals, nature, and people.
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government.

Banner 2:

Text Message:

- Good morning, everyone!
- How are you? I hope you're all right.

- Today I'm sending a voicemail and an infographic for you to be aware of cross-contamination in animal feed. We have to fulfill this grace period to produce healthy food.
- And, you already know, any questions, please contact me.
- I wish you all a good day.
- Do not reuse trucks

Infographic:

- Do not use the same truck to transport a bulk medicated feed together with a non-medicated feed. The truck must always be very well cleaned before transporting a feed without and another with medication.
- Cleaning: Cleaning of facilities and equipment must always be carried out.
- Facilities sharing: Be careful with shared facilities for different species of animals! There are products or foods that are prohibited for some species and allowed for others. For example, ractopamine and meat and bone meal are prohibited for cattle but permitted for pigs.
- Seek professional guidance: Always seek the guidance of a professional to carry out the training of employees who handle, transport, and administer medicated rations.
- Do not reuse bags: Do not reuse bags used to store medicated rations or...

FIGURE 34 - Infographic to be sent via social networks, p.

- New pest in banana plantations
- The Banana Fusariosis Race 4 does not exist in Brazil, but it can arrive unless we adopt preventive measures.
- What is it? Where does it come from? A new race of the banana fusariosis fungus (Panama disease) that is more dangerous, as there are still no resistant varieties and no chemical control to combat it. It is already present in Colombia and Peru. All banana varieties grown in Brazil can be affected.
- What causes? A soil fungus that infects the banana plant through the rhizome and then climbs to the pseudo stem preventing the conduction of water and nutrients to the leaves that will wither, yellow, necrose and die.
- A pest that kills all banana trees and stays in the ground for 40 years!
- What to do? Do not buy or accept donations of seedlings of unknown origin, not even from your neighbors. Do not bring seedlings from other countries. Wash the sidewalks and change clothes after finishing a visit to banana plantations. Clothing used on trips to visit foreign plantations must be washed well.
- You, banana farmer, can make all the difference! It is necessary to know well the problem to be able to fight against it.
- Now that you know the dangers of R4T for banana plantations, do your part!
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 35 - A4 format poster to be used on the walls of sheds in the field, unions, associations and ATER, p.

- Prevention alert!
- Banana pest fusarium r4 tropical - foc r4t
- Fusarium r4t is a fungus that attacks all bananas varieties, rotting their roots, stems and leaves!
- Learn how to prevent yourself! Do not buy or accept donations of seedlings of unknown origin, not even from your neighbors! Do not bring seedlings from other countries! Wash your shoes and change your clothes after finishing your visit to the banana plantations. Clothes used when visiting foreign plantations must be washed well!
- We are the agricultural defense at plant health minute in the field bringing you important information about the new plague of banana plantations: the tropical race 4 of banana fusariosis.
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 36 - Poster in layout optimized for both Instagram and WhatsApp environments, p.

- Prevention alert!
- Banana pest fusarium r4 tropical - foc r4t.
- Do not bring seedlings from other countries!
- The Fusarium R4 Tropical is in countries close to Brazil. It is a soil fungus, so be sure to clean shoes and vehicle wheels while still at the entrance to the property. Clean

implements and tools whenever you use them on another property!

- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 37 - Example of Pedagogical Framework offered in the book for use by educators, pg. XX.

- **Table 1** - Suggestions for combinations of pedagogical actions and teaching materials for use in teaching-learning processes in rural territories

Column 1

- Theme
- Getting to know the Banana Fusariosis Tropical Race 4
- Preventive measures for traveling abroad
- The importance of buying only seedlings with RENASEM
- Soil as a source of contamination
- The importance of buying only seedlings with PTV
- Preventive actions by MAPA

Column 2

- Voice Message

Column 3

- Text Message

Column 4

- Infographic

Column 5

- Banner

Source: Adapted from [13/14]

FIGURE 38 - Suggestions on how to send, via WhatsApp, the media for educational actions to rural producers, family members and employees, p.

Banner 1

Text messenger:

- Hello, farmer!
- How are you? We hope you are well. Today at Field Sanity Minute we are going to address an important issue: a new plague of banana plantations that could reach Brazil if we don't unite to fight it. This pest is called Race 4 Tropical of Banana Fusariosis or Foc R4T. Have a good day.
- Prevention alert
- Banana Fusarium R4 Tropical Tropical - foc r4t.
- Fusarium R4 Tropical is a soil fungus that attacks all banana varieties by rotting their roots, stems, and leaves! There is no control for this pest, prevention is the solution.

- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

Banner 2

Infographic

- Hello, farmer!
- How are you? We hope you are well. Today at Field Sanity Minute we are going to address an important issue: a new plague of banana plantations that could reach Brazil if we don't unite to fight it. This pest is called Race 4 Tropical of Banana Fusariosis or Foc R4T. Have a good day.
- What causes? A soil fungus that infects the banana plant through the rhizome and then climbs to the pseudo stem preventing the conduction of water and nutrients to the leaves that will wither, yellow, necrose and die.
- A pest that kills all banana trees and stays in the ground for 40 years!
- What to do? Do not buy or accept donations of seedlings of unknown origin, not even from your neighbors. Do not bring seedlings from other countries. Wash the sidewalks and change clothes after finishing a visit to banana plantations. Clothing used on trips to visit foreign plantations must be washed well.
- You, banana farmer/producer, can make all the difference! It is necessary to know well the problem to be able to fight against it.

- Now that you know the dangers of R4T for banana plantations, do your part!
- Prevention is the solution!
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 39 - Suggestions for ways to send, via WhatsApp, pedagogical actions to rural producers, family members and employees, p.

Banner 1

- Hello, dear farmer.
- We are the Agricultural Defense bringing important information in the Field Sanity Minute in the Field. Did you know that a new pest that attacks banana plantations, the Fusarium oxysporum f.sp cubense, also known as Foc R4T, may arrive in Brazil? This is a soil fungus that infects banana trees through the rhizome and then climbs to the pseudo stem, preventing the conduction of water and nutrients to the leaves, which will wither, yellow, necrose and die. Foc R4T affects all plants in a clump, affects the mother plant, its daughters, granddaughters and everyone else. This new breed of fungus is more dangerous because there are still no resistant varieties and no chemical control to combat it. All varieties of bananas grown in our country could be affected. The Banana Fusariosis Race 4 does not exist in Brazil but it can arrive if we do not adopt preventive measures. Foc R4T has spread around the world and has already reached Colombia and Peru, very

close to us. To prevent this pest from entering, stay informed! The adoption of good agricultural practices in the management of banana plantations will ensure that, if a pest such as Foc R4T arrives in Brazil, it will not enter your property. Do you want to know more about good agricultural practices in preventing this pest? See EMBRAPA West Amazon's Technical Communication nº 149 of 2020 available on Mapa and Embrapa websites. You can make all the difference. It is necessary to know to be able to fight. Now that you know and understand the dangers of Foc R4T for banana plantations, do your part! We will not let this fungus reach Brazil. For Foc R4T there is no control, prevention is the solution!

Banner 2

- Hello, farmer!
- How are you? We hope you are well. Today at Field Sanity Minute we are going to address an important issue: a new plague of banana plantations that could reach Brazil if we don't unite to fight it. This pest is called Race 4 Tropical of Banana Fusariosis or Foc R4T. Have a good day.
- Prevention alert!
- Banana pest fusarium r4 tropical - foc r4t
- Fusarium r4t is a fungus that attacks all bananas varieties, rotting their roots, stems and leaves!
- Learn how to prevent yourself! 1.Do not buy or accept donations of seedlings of unknown origin, not even from your neighbors! Do not bring seedlings from other countries! 2. Wash your shoes and change your clothes

after finishing your visit to the banana plantations. 3. Clothes used when visiting foreign plantations must be washed well!

- We are the agricultural defense at plant health minute in the field bringing you important information about the new plague of banana plantations: the tropical race 4 of banana fusariosis.
- Prevention is the solution!
- Sanitary education commission CES/SFA-SP/MAPA. Ministry of Agriculture, Livestock and Supply Beloved Homeland, Brazil, Federal Government

FIGURE 41 - Poster on the theme of the payroll loan in the format of Instagram to send via WhatsApp or Telegram, p.

- Dialogues on credit and indebtedness
- PAE - Debt Support Plan
- FDRP/USP
- Payroll loan!
- Be aware of the limit imposed by law!
- Knowing your rights is the first step to protecting your assets. Avoid indebtedness.

FIGURE 42 - Infographic that helps in understanding the basic information on the characterization of family farming for Pronaf, p.

- Debt support program
- Personal loan
- Have you ever needed a loan? Come and learn about the interest and risks of this type of credit.

- First: what is a loan? When someone needs money to buy a product or pay off a debt, they can go to a financial institution and apply for a loan, paying interest for it.
- What makes this mode different? Unlike the payroll loan, which has an automatic discount from your salary, and the secured loan, which requires a good linked to the payment, the personal loan does not need any collateral, being paid only with contracted interest.
- How is interest calculated? Interest is calculated from your credit and income history. That is, it depends on how much you earn monthly and if you are a good payer. Retirees and pensioners usually have access to lower interest rates, as their salaries are more guaranteed.
- Care and alternatives. Interest can range from 0.86% to 26% per month. Therefore, it is important to be careful not to go into debt beyond what is necessary and to choose the financial institution from which you will apply for the loan. Generally, credit unions tend to offer lower rates.
- PAE - Debt Support Plan
- FDRP/USP

FIGURE 44 - Suggestions for sending pedagogical actions and their teaching materials via WhatsApp application, p.

Banner 1

Text messenger:

- Good morning, everyone.
- How are you? I hope they are well. Today we are going to talk about some personal credit rules. Knowing your

rights is the first step to protecting your assets. Avoid indebtedness.

- Have a great day.
- Dialogues on credit and indebtedness
- PAE - Debt Support Plan
- FDRP/USP

Infographic:

- Personal credit.
- Be aware of the limit imposed by law!
- Knowing your rights is the first step to protecting your assets. Avoid indebtedness.

Banner 2

Text messenger

- Good morning, everyone.
- How are you? I hope they are well. Today we are going to talk about some personal credit rules. Knowing your rights is the first step to protecting your assets. Avoid indebtedness.
- Have a great day.

Infographic:

- When someone needs money to buy a product or pay off a debt, they can go to a financial institution and apply for a loan, paying interest for it.

- What makes this mode different? Unlike the payroll loan, which has an automatic discount from your salary, and the secured loan, which requires a good linked to the payment, the personal loan does not need any collateral, being paid only with contracted interest.
- How is interest calculated? Interest is calculated from your credit and income history. That is, it depends on how much you earn monthly and if you are a good payer. Retirees and pensioners usually have access to lower interest rates, as their salaries are more guaranteed.

ANNEX 2 - Book series "Dialogues in the countryside": list of authors

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Some of the authors are present in more than one book, others in just one. Consult the bibliographic references to see each participation in the works they contributed.

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Sobre o livro

Projeto Gráfico, Editoração e Capa	Leonardo Araújo
Formato	15 x 21 cm
Mancha Gráfica	11 x 16,8 cm
Tipologias utilizadas	Iowan Old Style 12 pt

We present an educational methodology aimed at a participatory Digital ATER in One Health, Sustainability and Social Equity, with examples and availability of educational resources. When the three main elements of One Health (man, biomes, and agricultural production) are expanded and deployed, they can be categorized into four major areas. They determine the sanitary quality of countryside standards: location, economy, interactions, and social behaviors. When collating One Health approach and the agricultural production, it is possible to have a clearer view in the processes of understanding, planning, development and implementing actions that constantly aim at sanitary control and prevention in the countryside. This book helps in the planning, development, and application of various pedagogical contents via digital teaching-learning ecosystems in the countryside territories, in this new productive reality.

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