

PRODUCTION OF OPEN EDUCATIONAL TEXTS: STUDY SITUATION IN THE NATURAL SCIENCES AND THEIR TECHNOLOGIES

Dra Maria Cristina Pansera-de-Araújo¹, Dr Milton
Antonio Auth² & Dr Otavio Aloisio Maldaner¹

¹UNIJUI-DBQ-GIPEC; ²UFU-PONTAL

The characteristics of textbooks, designed to provide learning contents to be transmitted to students in each grade or school year, don't meet current needs for quality education (AMARAL, 2006).

The textbooks were subject of many researches in Brazil, which identified serious flaws of various kinds and have been indicated by teachers to be read, studied and memorized by students for evaluation.


A famous saying circulate among Brazilian educators “*a matter of school comes from the textbook to the blackboard and back to the student’s notebook without passing through the mind of either of two persons*” (FROTA PESSOA, personal communication)

**The nature of the work school teacher requires
guidelines to be consulted at any time with
systematized and intentionally meaning
school knowledge.**

In Brazil, the teachers of basic education from 5th year of schooling have a workload that requires them to change many times from one classroom to another of the same school or different schools in the same day. Thus, the textbook is the possible resource!

The National Programs for Distribution of Textbooks favor this cycle, while national (SAEB; ENEM) and international (PISA) assessments of Brazilian students of basic education show a sagging performance in knowledge, skills and cognitive abilities.

**Therefore, the textbook has not made the
role to constitute the younger generations
with the knowledge required by the
technological and cultural environment**




Students come to school today with their own explanations about the phenomena of everyday life because they are subjected to lots of information, not found in textbooks.

They control practices and the mental operations supported by concepts of experience, whose meanings were produced in social interactions, with a complex mental structure.

How the mental development can happen in everyday situation and at school it has been little?

In everyday life, the learning and mind development happen mediated by the meanings produced and internalized, in the practical situation, in interaction with other individuals.



At school, the purpose is to teach, learn and develop the minds of students, mostly with idealized situations and not real.

This requires change in the traditional pedagogical practices in the classroom: to produce a rich environment interaction on a given situation.

Thus, we argue that the resource materials used by teachers and students at the school have these characteristics, as we suggested in Study Situations, elaborated in our Interdepartmental Group for Research on Science Education (GIPEC-UNIJUÍ)

The Study Situations deal with everyday situations of high experience of students and teachers, conceptually rich, from the science point of view

They were elaborated and systematized in a contextualized perspective, interdisciplinary and transdisciplinary, which allows the development of conceptual understanding significantly.

It is a didactic text open, where the scientific concepts are recognized in the situation to be systematized , as well as the skills, values, procedures and attitudes.

• **a) the authors:** public school teachers and university, their experiences and voices, accompanied by questions of his students, even implicitly;

• **b) the phases:** i. development and collective planning of the Study Situation; ii. re-elaboration of didactic material by subject, considering the contributions of different groups, who experienced the Study Situation;

**everyday
situations
students and
teachers
experiences**

**INTERDISCIPLINAR
TRANSDISCIPLINAR
INTER-RELATIONAL**

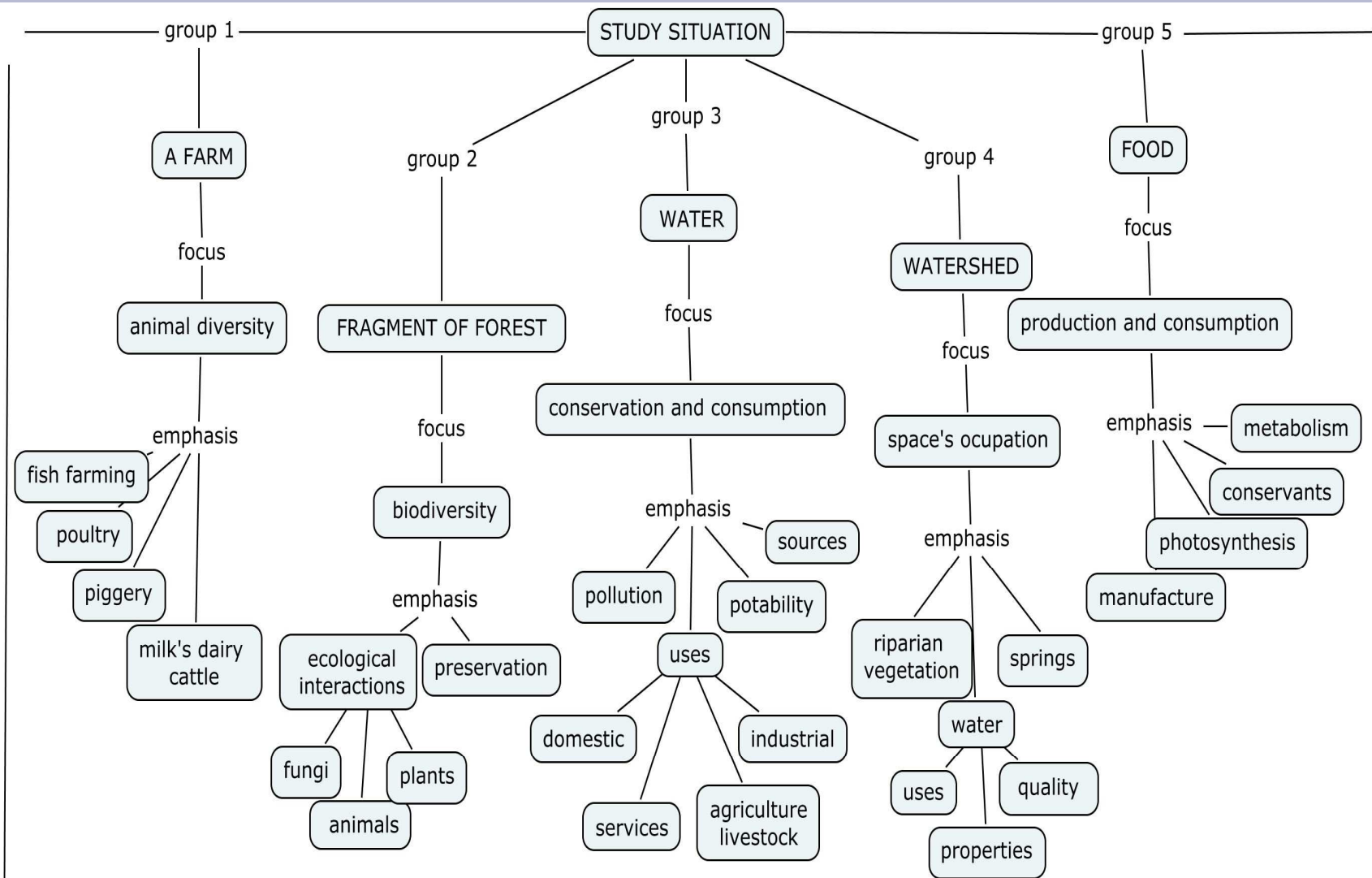
**EVOLUTION
OF THE
CONCEPTS**

STUDY SITUATION'S CHARACTERISTICS

**INITIAL AND
CONTINUING
TEACHER'S
FORMATION**

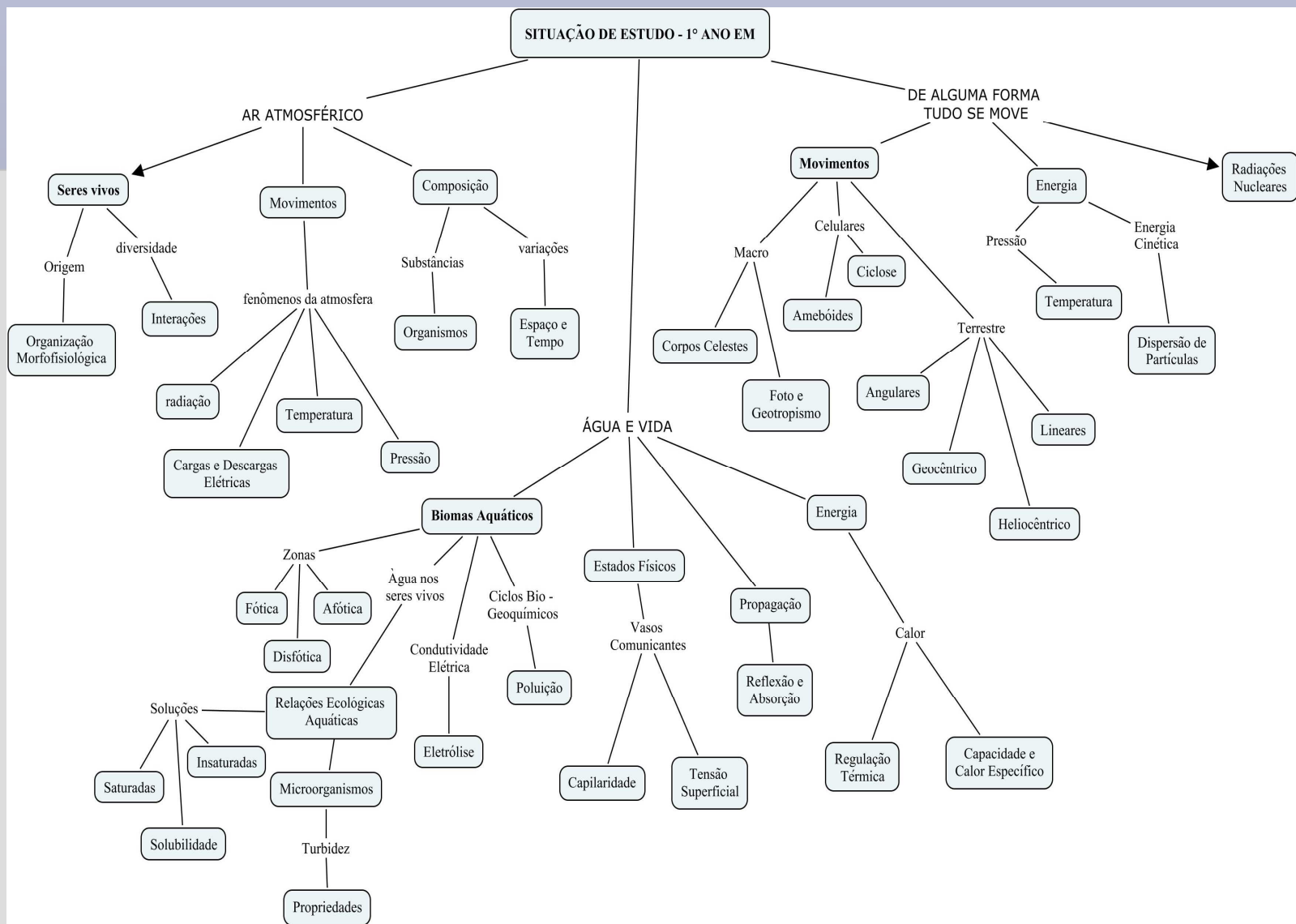
**WORLD GLOBAL
VISION.**

**SCIENCE,
TECHNOLOGY
AND SOCIETY
(STS)**



Some empirical evidence from the field show the design and development of SE in High

School (MS), which articulate the same situation from the viewpoint of biology, physics and chemistry, provide meaningful learning, from an open proposition. The study is not organized in a linear perspective, but from the necessity of understanding the scientific concepts that help shape a



The Study Situation "How everything moves" was developed in a class of first year of high school in a partner school of research conducted (Figure 2). The lessons of the three curriculum components of natural sciences and their technologies were video recorded and transcribed.

The episode EP2B Movement (selected from biology class), presented below, allows to understand how evolution occurs conceptual understanding of the relationship established by students and integrating the concepts of the curriculum components of biology, physics and chemistry.

EP2B Movement

159-T: has movement in cells? 160-Students: course 161-T: what movement? 162-Students: cells move they have their own system 163-T: (...) these cells have organelles which are small organs that carry out activities there and in cell movement really happens, it does not out of place to the other 164-Students: not as prof. the bloodstream? 165-T: ah okay, the bloodstream (....) 173-T:

The students utilized the concepts of the 3 disciplines in the Biology, Physics and Chemistry's classes, when their transition from one field to another was essential and facilitated understanding of the issues addressed in each one.