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# Interdisciplinarity as a factor promoting meaningful learning among sixth-grade pupils at "11 de Novembro" Primary School in Calulo, Libolo Municipality, Cuanza Sul, Angola

*A interdisciplinaridade como fator promotor de aprendizagens significativas aos alunos da 6ª classe da Escola do Ensino Primário "11 de Novembro" em Calulo, município do Libolo, Cuanza Sul, Angola*

*La interdisciplinariedad como factor promotor de aprendizajes significativos en los alumnos del 6.º grado de la Escuela de Enseñanza Primaria "11 de Novembro" en Calulo, municipio de Libolo, Cuanza Sul, Angola*

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**Abstract:**
This article aims to reflect on interdisciplinarity as a factor for integrating and overcoming the fragmentation of two or more curricular subjects in building student knowledge at the "11 de Novembro" Primary School, in the Municipality of Libolo, Angola. This approach serves as a methodology for integration and complementarity among curricular components within the comprehensive construct of student knowledge. Interdisciplinarity articulates subjects and awakens a holistic view of knowledge in learners, ensuring training that empowers them to act within and transform the social contexts they inhabit, from a sustainability perspective. Discovering the connecting points between these subjects depends on a pragmatic and contextualized teaching practice. Conversely, fragmented teaching deprives students of interaction with other fields, hindering them from reflecting and acting constructively within their own teaching-learning process. Furthermore, this article briefly addresses the difficulties encountered when implementing interdisciplinarity in the classroom. The primary obstacle identified is the specific training of teachers, which often fails to encourage them to reference other fields of knowledge in their practice, thereby restricting student creativity and the expansion of their knowledge.

**Keywords:**
Interdisciplinarity. Promotion. Meaningful learning.

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**Resumo:**
O presente artigo teve como propósito refletir sobre a interdisciplinaridade como fator de integração e superação da fragmentação de duas ou mais disciplinas curriculares na construção do conhecimento dos estudantes da Escola do Ensino Primário "11 de Novembro", no Município do Libolo, Angola. Essa abordagem configura-se como uma metodologia para a integração e a complementaridade entre os componentes curriculares no constructo integral do conhecimento do aluno. A interdisciplinaridade articula as disciplinas e desperta nos discentes uma visão holística do saber, garantindo uma formação que os capacite a atuar e a transformar os contextos sociais em que estão inseridos, sob uma perspectiva de sustentabilidade. A descoberta dos pontos que interligam tais disciplinas depende de uma atuação docente pragmática e contextualizada. Em contrapartida, o ensino fragmentado destitui o aluno da interação com as demais áreas, impossibilitando-o de refletir e de agir de maneira construtiva em seu próprio processo de ensino-aprendizagem. Neste artigo, realizou-se também uma breve abordagem sobre as dificuldades encontradas na efetivação da interdisciplinaridade em sala de aula. Identificou-se como principal obstáculo a formação específica do professor, a qual muitas vezes não o estimula a fazer referência a outras áreas do saber durante sua prática, limitando a criatividade e a expansão do conhecimento do estudante.

**Palavras-chave:**
Interdisciplinaridade. Promoção. Aprendizagens significativas.

**Resumen:**
El presente artículo tuvo como propósito reflexionar sobre la interdisciplinaridad como factor de integración y superación de la fragmentación de dos o más disciplinas curriculares en la construcción del conocimiento de los estudiantes de la Escuela de Enseñanza Primaria "11 de Noviembre", en el Municipio de Libolo, Angola. Esta aproximación se configura como una metodología para la integración y la complementariedad entre los componentes curriculares en el constructo integral del conocimiento del alumno. La interdisciplinaridad articula las disciplinas y despierta en los discentes una visión holística del saber, garantizando una formación que los capacite para actuar y transformar los contextos sociales en los que están insertos, bajo una perspectiva de sostenibilidad. El descubrimiento de los puntos que interconectan tales disciplinas depende de una praxis docente pragmática y contextualizada. En contrapartida, la enseñanza fragmentada priva al estudiante de la interacción con las demás áreas, imposibilitándolo de reflexionar y actuar de manera constructiva en su propio proceso de enseñanza-aprendizaje. En este artículo también se abordaron brevemente las dificultades encontradas en la efectivación de la interdisciplinaridad en el aula, identificando como principal obstáculo la formación específica del profesor, la cual muchas veces no lo estimula a hacer referencia a otras áreas del saber durante su práctica, limitando la creatividad y la expansión del conocimiento del estudiante.

**Palabras clave:**
Interdisciplinaridad. Promoción. Aprendizajes significativos.

## Introduction

Changes in the world do not allow the educational process to remain static. Today, educational activities frequently refer to interdisciplinarity, especially when preparing schools' annual plans. Subject integration features prominently in the Literacy and Accelerated

Schooling programme, but no consensus has been reached, because failure to implement these practices in classrooms stems from uncertainty about the interpretation of interdisciplinarity.

• From the nineteenth century onwards, the specialisation of scientific disciplines increasingly culminated in fragmentation of the epistemological horizon;

• Human beings sought to know increasingly more about the object;

• Knowledge became narrower;

• In the 1970s, criticism emerged of prevailing pedagogy and educational policy;

• Thereafter, many thinkers argued that no realities exist independently of other dimensions of human existence; rather, they cannot be studied individually as isolated phenomena;

• Social themes and facts should be analysed in their entirety, as a system, and viewed in relation to one another.

Thus, this article reflects on interdisciplinarity as a pedagogical dimension in integrating knowledge into teachers' classroom work. Interdisciplinary complexity in the classroom is a difficult, but not impossible, phenomenon, involving diversity of experiences, moods, cultures, social and economic classes, feelings and so forth. Interdisciplinary characteristics better prepare individuals for professional training, which increasingly requires contributions from several disciplines. A brief reflection also addresses multidisciplinarity, in which all subjects share the same hierarchical level; pluridisciplinarity, which links disciplinary domains; transdisciplinarity, which integrates several interdisciplinary systems within a broader, more general context; and, finally, examples of working from an interdisciplinary perspective.

This research began with the following scientific problem: how does interdisciplinarity promote the capacity to engage in dialogue with different sciences or disciplines, understanding knowledge as a whole rather than as separate or fragmented parts?

The analysis arose from observation of the following object of study: interdisciplinarity in the teaching and learning process.

The general objective was to connect knowledge, understanding, lived experience, school, community and the environment. This is the overall aim of interdisciplinarity, expressed in practice through collective, supportive schoolwork.

The specific objectives were: (i) to determine the role of interdisciplinarity in promoting pupils' meaningful learning; (ii) to promote the integration of content from different subjects in curricular and extracurricular activities; and (iii) to help teachers recognise interdisciplinarity as an educational practice seeking complementarity between fields of knowledge, so that the content of each subject supports learning in the others.

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Interdisciplinarity is important for linking subjects and, above all, for encouraging pupils to discover the points connecting them.

Teachers should consider interdisciplinarity an indispensable tool because it provides complementary or supplementary interaction between subjects. Such interaction may even lead to situations in which one topic encourages work on another far beyond what was planned.

Interdisciplinarity makes it possible to cross disciplinary boundaries, creating links between different fields of knowledge in a contextualised learning situation.

However, the aim of an interdisciplinary approach is not to eliminate disciplinary activities. Subject boundaries become permeable while a particular phenomenon is investigated. Nevertheless, each field of knowledge retains its identity, with ample scope for deeper learning of its specific content.

## Conceptualising interdisciplinarity

Interdisciplinarity derives from “interdisciplinary”, meaning something common to two or more disciplines. It concerns the process of connecting disciplines. It is therefore an approach in which teaching takes account of pupils’ construction of knowledge. This practice does not dissolve school subjects; it expands disciplinary work by bringing teaching activities together and linking them in coordinated action directed towards clearly defined objectives.

There are several concepts of interdisciplinarity, all focusing on “integration”, as described below from different authors’ perspectives:

“Interdisciplinarity is the interaction of two or more disciplines. These interactions may involve transferring laws from one discipline to another, sometimes giving rise to a new disciplinary field, such as Biochemistry or Psycholinguistics” (Zabala, 2002, p. 45).

“Interdisciplinarity is a term used to characterise collaboration between different disciplines or heterogeneous sectors of the same science. It involves intense reciprocity in exchanges, seeking mutual enrichment” (Fazenda, 2002, p. 86).

> “Interdisciplinarity is a research and teaching method capable of enabling two or more disciplines to interact. This interaction may range from simply communicating ideas to mutually integrating concepts, epistemology, terminology, methodology, procedures, data and research organisation” (Japiassú, 1991, p. 72).

An interdisciplinary theme, objective or approach involves two or more disciplines intentionally establishing connections and links to achieve knowledge that is broader, simultaneously diversified and unified.

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## Definition

Interdisciplinarity is an attitude, that is, an expression of a worldview that is holistic. The term holistic, from the Greek holos, meaning entirety, refers to understanding reality through integrated wholes whose properties cannot be reduced to smaller units (Fazenda, 1996).

Morin, a contemporary transdisciplinary thinker:

• Advocates connecting different fields to construct knowledge;

• Opposes reductionism;

• Values complexity.

## Classroom complexity according to Edgar Morin

The classroom is a complex phenomenon involving diverse experiences, moods, cultures, social and economic classes, feelings and so forth. It is a heterogeneous space.

The school curriculum is currently implemented in a minimalist, simplistic and fragmented way. The curriculum document contains substantive elements for pupils' comprehensive education. However, many teachers' implementation does not provide a holistic view: subjects are not taught transversally or multidisciplinarily, hindering the global perspective that supports meaningful learning.

"Reconnect knowledge", with everyone's contributions; demonstrate that we can reconnect different forms of knowledge without destroying disciplines (Morin, 2000, p. 43).

Edgar Morin regards thought as a continuous, evolving process concerning surrounding and imagined reality that leads individuals towards self-transcendence and thinking beyond the object, giving renewed meaning to learned content for subsequent use.

Another important point in Morin's work concerns contextualisation: the need to place parts within the whole, since scattered information that does not fit into an overall worldview or connect with each person's existing cognitive networks loses its significance.

For Japiassu (1976), reflection concerns the actual conditions in which interdisciplinary knowledge is produced, developed and connected, seeking convergence in understanding a phenomenon.

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**How can interdisciplinarity be practised?**

Specialists should meet not merely to exchange data, but to promote exchanges and criticism in a shared place and on a specific occasion, moving beyond the epistemological "islands" maintained by institutions still compartmentalising knowledge. Communication between specialists reduces obstacles to mutual enrichment. Researchers and teachers should create space for working together, seeking interaction between two or more disciplines through their concepts, guidelines, methodologies, epistemologies, procedures, data and so forth (Japiassu, 1976).

Interdisciplinary action brings together different fields and interests to solve problems centred on an action or decision.

Interdisciplinarity is practised through joint planning, in which teachers from different subjects design multidisciplinary strategies to solve a particular problem or select methods and techniques usable in more than one subject. They may also apply demonstrations or curricular and extracurricular activities that help pupils understand content from different subjects within a single approach.

A single teaching activity can support multiple learning outcomes while preparing pupils for concrete action.

**Central characteristics of interdisciplinarity**

Japiassu (1976), a follower of Jean Piaget, identifies the following characteristics of interdisciplinarity:

It incorporates results from several disciplines, borrowing their conceptual frameworks for analysis in order to integrate them;

It enables exchanges of information to reorganise the scientific environment;

It broadens the general education of everyone involved;

It questions scientists' possible complacency within their implicit assumptions and restricted communication, which make exchanges difficult;

It better prepares individuals for professional training, which increasingly requires contributions from several disciplines;

It prepares and engages specialists in team research so that they recognise the limits of their own methodology and can engage in dialogue to achieve synergistic action;

It challenges disciplinary fragmentation and advocates pedagogy that privileges interdisciplinary connections;

It breaks with the paradigm of fragmentation, specialisation and compartmentalisation that favours fragmented knowledge;

A sufficiently broad epistemological outlook is needed to observe relationships between a discipline and others without neglecting its specialist domain.

## Epistemological dimensions of interdisciplinarity

Defining an object still under construction is difficult and somewhat complex, since it gradually changes and transforms. Interdisciplinarity should not be seen as encyclopaedic knowledge, but as transversal knowledge affecting pupils' lives and lived contexts. Thus, every discussion of interdisciplinarity can be compared with contemporary material on the subject until it is better developed and articulated, through practice more than theory, since interdisciplinarity is taking place and a theory has developed from it: pragmatism.

An epistemological study is useful for delimiting the topic. Four particularly related words each define a scientific and educational approach.

### 1. Multidisciplinarity

• Separate bodies of knowledge without interaction;

• All remain at the same hierarchical level;

• There is no "bridge" between these disciplinary domains. Multidisciplinary and interdisciplinary relationship: to achieve systematisation of subject content and its integration with previously learned content (...) (Miranda and Echevarría, 2019, p. 189).

According to Piaget, cited by Nieman and Brandoli (2012), multidisciplinarity occurs when solving a problem requires information from two or more sciences or fields of knowledge without modifying or enriching the disciplines involved.

### 2. Pluridisciplinarity

• Interaction between bodies of knowledge;

• Links between disciplinary domains;

• Some cooperation and emphasis on relationships between those bodies of knowledge.

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## 3. Interdisciplinarity

As shown in the image below, a Portuguese language teacher is invited into a Mathematics lesson to explain mathematical theorems terminologically and conceptually, making exercises and problems in Mathematics easier to understand.

Pupils attentively follow the dialogue between the two teachers, experiencing the value of scientific humility and shared knowledge. They seek to connect skills so that constructive dialogue improves their learning pace.

The image below is particularly illustrative. It helps explain how teachers encourage pupils to seek constructive insights connecting content already learned or yet to be learned with real life, and how these insights support both understanding and easy, lasting retention in pupils' memory, allowing recall when knowledge needs to be used or applied in practice.

Interdisciplinarity is the methodological instrument of didactic and pedagogical pragmatism aimed at meaningful learning, which currently incorporates the guiding principles of "Andragogy", the educational science concerned with adult learning through active teaching and learning methodologies (De Aquino, 2011).

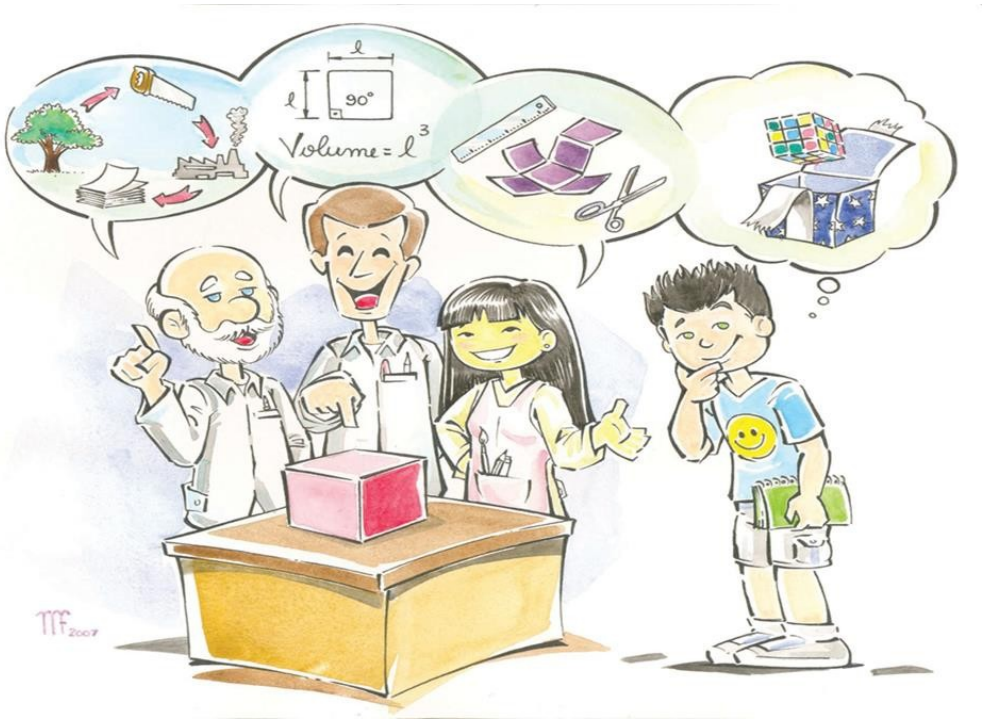


Photo: Emanuelle Oliveira/processed online. Available at: <http://vsites.unb.br/ppgec/dissertacoes/proposicoes/proposicao_jairocarlos.pdf>. Accessed: 22 April 2023.

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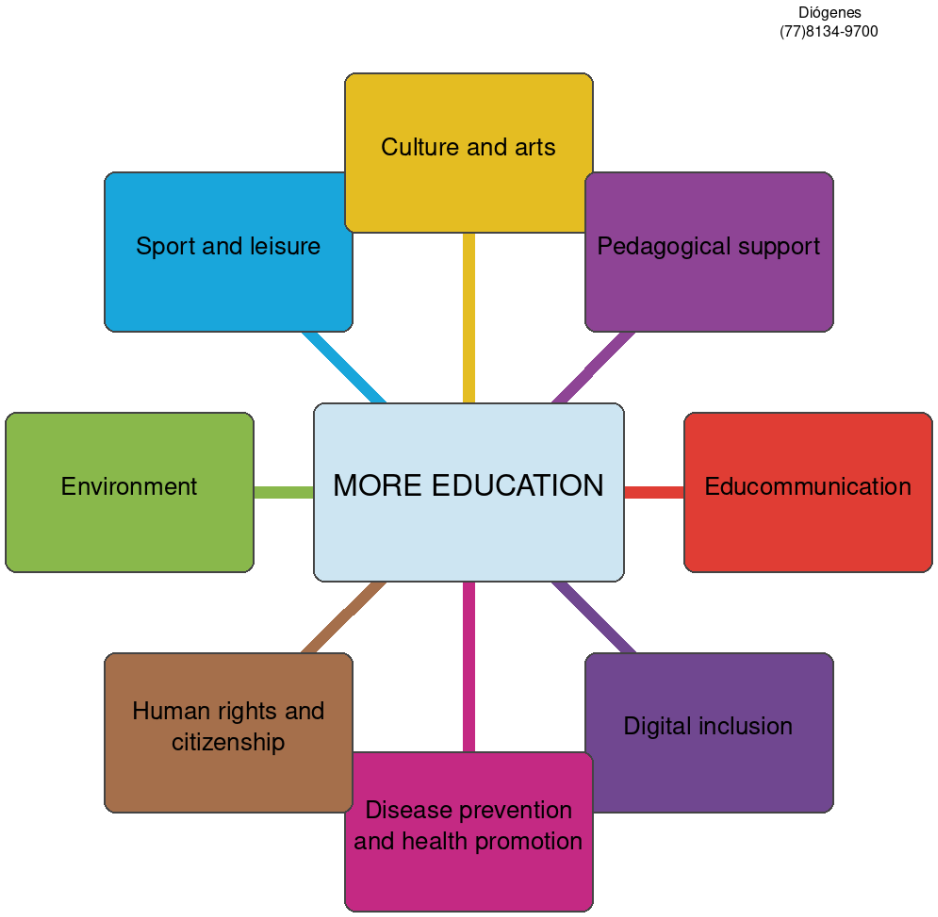
Disciplinary actions are organised and linked voluntarily and in coordination towards a common interest: pupils' learning. Interdisciplinary teaching allows more than one teacher to participate in a lesson for a single subject, because certain Portuguese language skills are necessary to understand History, which in turn supports Geography and vice versa, or Mathematics skills are essential to learning Physics or Chemistry.

This perspective underlies current discussion of "STEM" (Sciences, Technologies and Mathematics), an English acronym translated as Ciências, Tecnologias e Matemática. A project of the United Nations Educational, Scientific and Cultural Organization (UNESCO) aims to promote science and technology education for women as part of the "Education and Women's Empowerment" project.

Current educational guidelines address interdisciplinarity, as advocated by Sacristán and Gómez (2002): "understanding and transforming teaching means producing more education" (p. 73), as illustrated below:




www.google.imagem.com. Viewed on 23 March 2025.

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## 4. Transdisciplinarity

• Integration of several interdisciplinary systems within a broader, more general context;

• A more holistic interpretation of facts and phenomena.

Thus, these words share the term discipline, understood as the “slices” of scientific study and school subjects, such as Mathematics, Biology, Natural Sciences and History, together with an effort to overcome everything associated with the concept of discipline.

## Main empirical findings

The empirical investigation involved classroom observations, observations of fortnightly planning in Pedagogical Influence Zones (ZIP) and open interviews with teachers at “11 de Novembro” Primary School in Calulo, Libolo Municipality, Cuanza Sul, Angola.

The findings show that teachers do not interact as a multidisciplinary team in which they could share possibilities for work and for overcoming obstacles in planning, implementing and evaluating teaching and learning.

Neither resources nor working strategies are shared. Fortnightly meetings have served only to allocate thematic units for that period. Integrated lessons applying problem situations are not planned. Teachers do not invite colleagues to clarify aspects of their subject’s content intersecting with another colleague’s subject or field of training, resulting in fragmented understanding of the material.

Obstacles to interdisciplinary work can be reduced through teaching grounded in interdisciplinary practice, seeking to educate pupils with a global worldview who can “articulate, reconnect, contextualise, position themselves in a context and, if possible, globalise and bring together acquired knowledge” (Morin, 1977).

This worldview rests on the relationship between the whole and its parts, providing the necessary basis for interdisciplinarity. The concept relies on complexity and on addressing a theme or topic beyond disciplinary barriers, that is, attempting to address the subject as a whole.

Teachers’ training is very specialised, and universities do not prepare them for interdisciplinary work. Schools also lack spaces and time to reflect, evaluate and introduce educational innovations.

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## Examples of working from an interdisciplinary perspective

Example adapted from the Module 3 manual (2014):

When addressing the “Shape of the Earth” in Geography, teachers must discuss planets. To understand our planet Earth’s surface, we turn to Mathematics to calculate the amount of space occupied by a surface (p. 18).

Another example: discussing Angola’s current financial crisis can be linked to other “Global Financial Crises”. Integration can involve recalling other economic and political crises that also affected the whole world (p. 55).

In Geography, a discussion of continents can connect with Music Education by asking or teaching pupils to sing the African Anthem, “I feel proud to be African” (...). Grammar can be included by asking pupils to identify the root word of “proud”, and History by explaining why Africa is the cradle of humanity.

Discussing COVID-19 in Angola can begin with the country where it first emerged and the measures taken to prevent its spread. In Angola, a pupil created a commentary similar to sports commentary to explain more easily how the first case emerged worldwide and the route it followed, comparing it to a football’s trajectory, until reaching Angola. It also described how government bodies, through a multisectoral commission, managed and contained the effects of the COVID-19 pandemic in Angola through joint, active and proactive action.

Thus, interdisciplinarity is a strategy used by teachers to develop pupils’ critical skills and make teaching and learning more attractive and meaningful.

## Conclusion

Interdisciplinarity is a methodology that enables disciplines to engage in dialogue. Unity within the diversity of knowledge must be understood both in scientific research and in pedagogical relationships within our classrooms.

Working from this perspective requires teachers to adopt a stance beyond curricular programmes, taking a holistic attitude and using suitable teaching methodologies. Through interdisciplinary teaching within a historical and critical perspective, teachers can enable pupils to learn effectively and understand reality in its complexity, avoiding specialised, fragmented and compartmentalised education that prevents a global view of knowledge.

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