



**CITAD 8: 8th International Conference on the
Anthropological Theory of the Didactic**

19-23 Jan 2026 Bellaterra, Barcelona (Spain)

**Enquiring and questioning
works to be taught:
the state of the art in the ATD community**

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Introduction

A message from the IPC chair

- “present the work done so far by the ATD community in the axis, a sort of "state of the art", with a particular focus on research praxeologies”.

Axes of the conference

- (1) Society and the curriculum problem: enquiring and questioning works
- (2) Society and the curriculum problem: enquiring and questioning the world
- (3) The professions

Our goal: To construct the state of the art of research in the ATD community that addresses curricular issues related to the works

Scientific theme of Axis 1

ATD based research has taken, and takes, several different angles on the curriculum problem (Gascón & Nicolás, 2023):

- *Descriptive studies*: how specific works are included in curricula and/or treated in different textbooks for a given school system or comparing different school systems.
- *Retrospective studies*: how specific works have been prescribed and treated in a given school system at different points in time, and how this explains the working of current school systems.
- *Prospective studies*: theoretical or experimental research on alternative curricula (or elements of curricula), understood as regulations of how the study of works is organised in a given school system.

(Presentation and scientific theme of CITAD 8)

The notion of work

“A work (French *œuvre*) is any intentional product of human activity. Two types of works are of special interest to ATD. The first one is that of *questions* (which are indeed products of human activity); the second one is that of *praxeologies*” (Chevallard & Bosch, 2019, p. xxxvii)

Different kinds of works:

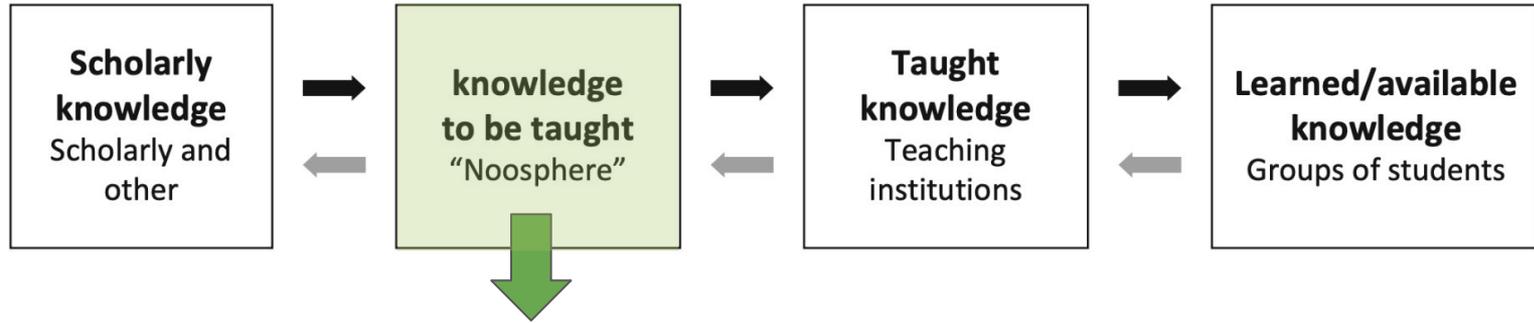
- Questions
- Disciplinary works (e.g., mathematics, physics)
- Professional works (e.g., didactic, engineering)
- ...

The notion of curriculum

“To speak of a curriculum, one must now assume a training institution, I , that implements this curriculum. Denoting by e the position of the ‘learner’ within I , a curriculum (or course of study) is defined as a sequence of pairs $C_I = (o_p, R_I(e; o_p))_{p \in P}$, where $R_I(e; o_p)$ is the institutional relation to o_p for subjects of I occupying position e . Following the curriculum C_p and thus studying the objects o_p within I , requires x to be subjected to the institutional relations $R_I(e; o_p)$. This subjection is in principle intended to bring his personal relations $R(x; o_p)$ into conformity with the institutional relations $R_I(e; o_p)$.” (Chevallard, 1997, p. 3; our translation)

- The research we investigate studies C_I or a part of it.
- Identify $R_I(e; o_p)$ is to identify a work found within a given institution at a given time.

The notion of noosphere

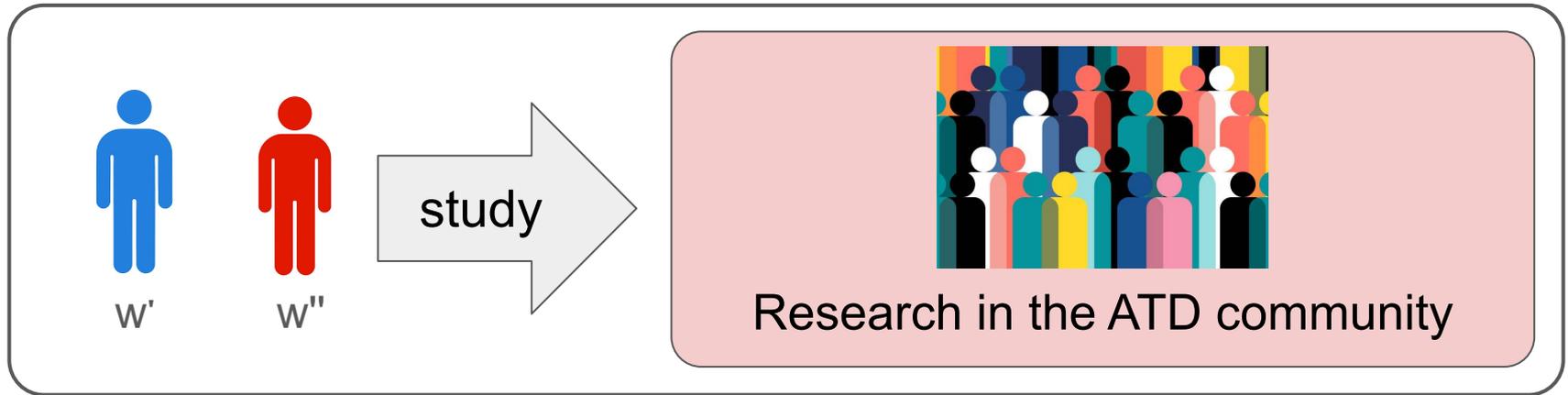


- works to be taught within I at a given time
- the C_I prescribed and designed by the noosphere for e

By *noosphere* — the sphere “where one thinks” — one refers to the set of institutions that surround the School without being part of it *stricto sensu* and that devote themselves to “reflecting” on the School: criticizing it, making suggestions, driving forward or hindering the changes that affect it or could affect it.” (Wozniak, 2005, p. 145, our translation)

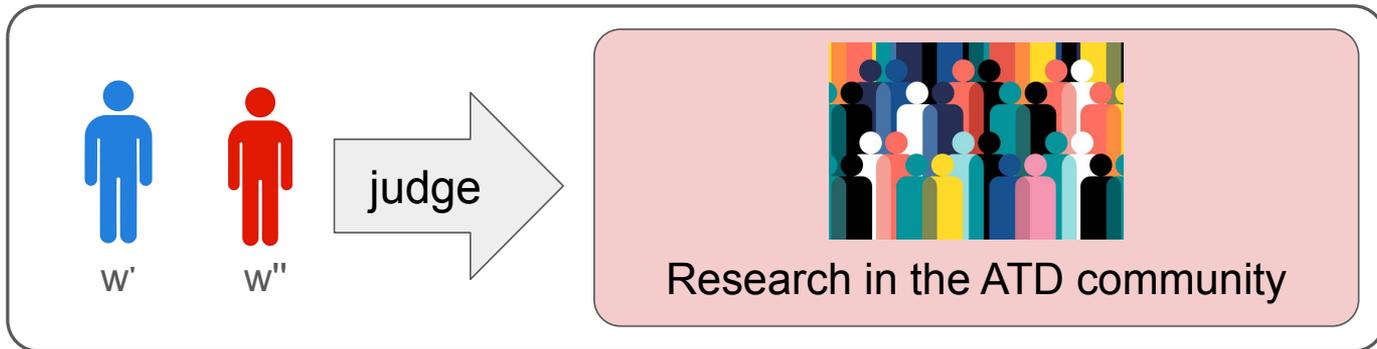
Our research objective

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught



The notion of judgment

“When we say — as we have done above — that one has $R_1(p, o) \neq \emptyset$, who is this “one”? The classic answer, within the framework of an exposition claiming scientific validity, is that this “one” is the author who speaks or writes insofar as they are a researcher [...]. Instead of the statement “one has $R_1(p, o) \neq \emptyset$ ”, we therefore consider the statement “according to \hat{w} , $R_1(p, o) \neq \emptyset$ ” which can also be written symbolically as $\hat{w} \vdash R_1(p, o) \neq \emptyset$. For this latter statement to be true, it is of course necessary that $R(\hat{w}, R_1(p, o)) \neq \emptyset$ ” (Chevallard, 2017, p. 5)



Research Praxeology

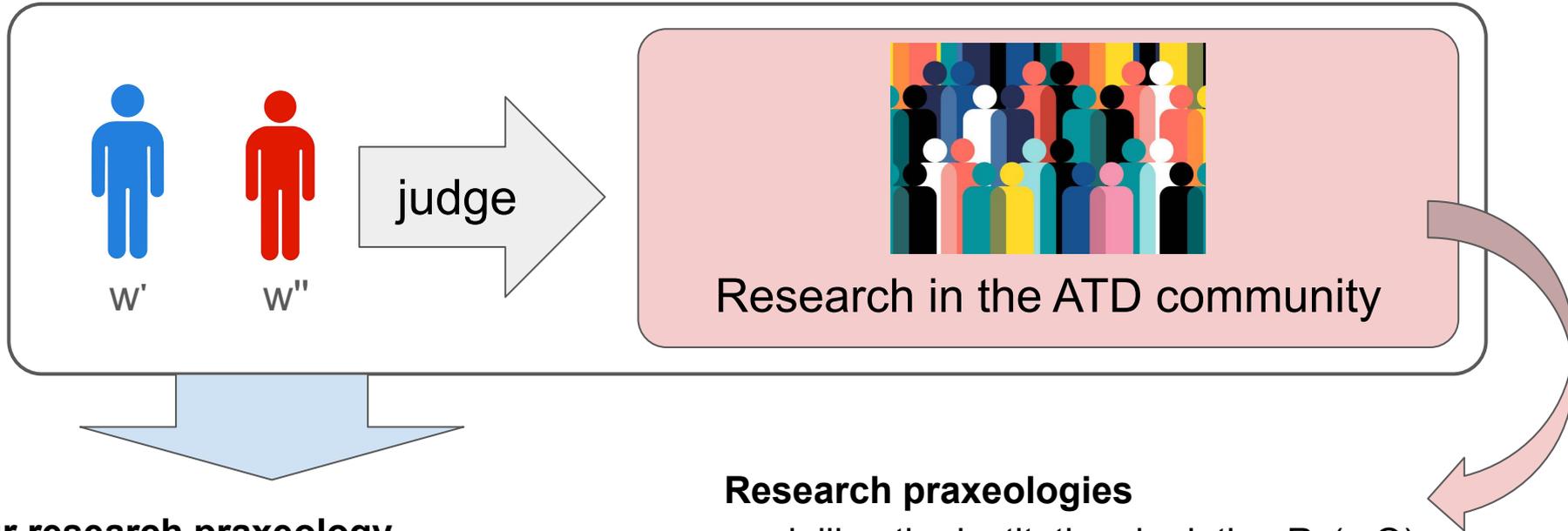
Concept introduced at CITAD3 - 2009 (Artigue, Bosch & Gascón 2011; Artigue & Bosch 2014)

“As any other praxeology, research praxeologies are composed of an amalgam of pieces that can be described by a set of four elements [T, τ, θ, Θ]”. (Artigue & Bosch 2014, p. 251)

- “the **types of tasks** are mainly composed of the research **questions and problems** approached”
- “The **techniques** correspond to the different possible “**ways of doing**” that can be used to carry out a task of a given type”
- “It [**technology**] includes the **methodological discourse** used for explaining and justifying the choices made in terms of research methods”
- “It [**theory**] is made up of the main **principles, notions, and properties** that are considered as unquestionable”

<i>Global praxeologies</i>	{Discipline: Didactics}	$\begin{aligned} & \sum \sum \sum [T_{ijk} / \tau_{ijk} / \theta_{jk} / \Theta_k] \\ & \sum \sum [T_{ij} / \tau_{ij} / \theta_j / \Theta] \\ & \sum [T_i / \tau_i / \theta / \Theta] \\ & [T / \tau / \theta / \Theta] \end{aligned}$
<i>Regional praxeologies</i>	{Domain: ATD}	
<i>Local praxeologies</i>	{Sector: Study of works to be taught}	
<i>Pinpoint praxeologies</i>	{Theme}	
	{Subject}	

Two kinds of Research Praxeologies



Our research praxeology

modelling our judgement/personal relation

$w \vdash R_{\Delta}(r, Q)$ or $R(w, R_{\Delta}(r, Q))$

w : individual researcher (Danielly or Takeshi)

Research praxeologies

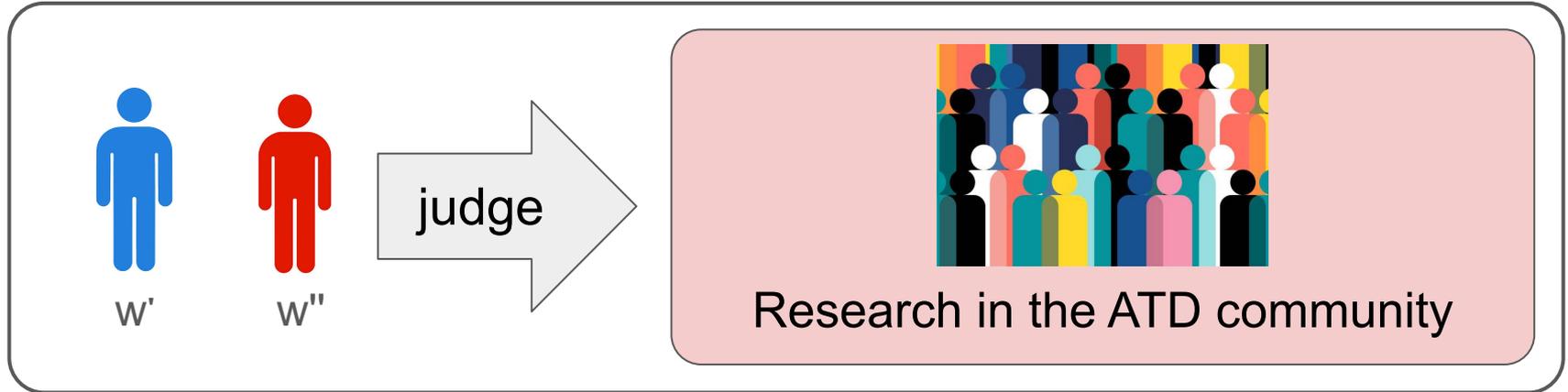
modelling the institutional relation $R_{\Delta}(r, Q)$

Δ : Research institution of ATD

r : position of the researchers

Q : Curricular questions related to the works to be taught

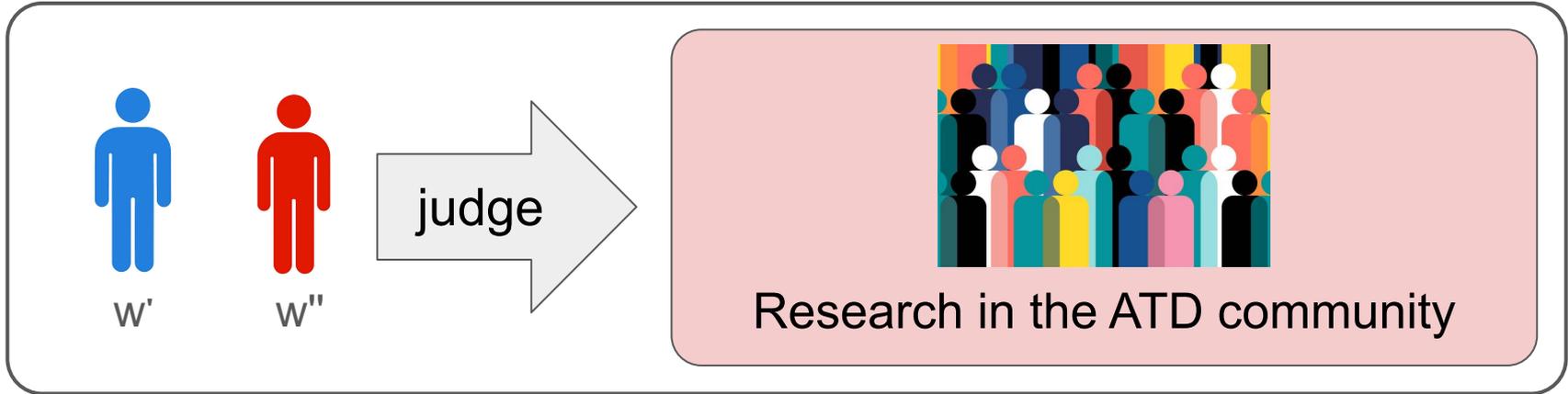
Research Praxeology as a methodological tool



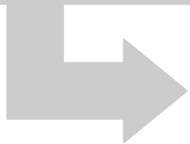
Two roles of the notion of research praxeology

- As an element of our logos block that provides us with research tasks
- As a tool used in our research techniques

Our research objective

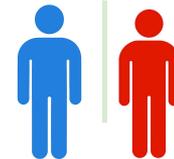


To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught



Task 0

Methodology in our Research Praxeology



Technique of Task 0

Task 0

Task 1

Task 2

Task 3

Task 4

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

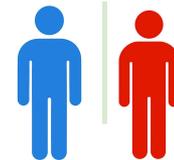
To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

To identify the **types of tasks** of the research praxeology in the corpus

To identify the **techniques** of the research praxeology in the corpus

To identify the **logos block** of the research praxeology in the corpus

Methodology in our Research Praxeology



$[t, \tau, \theta, \Theta]_{1.n}$

$[t, \tau, \theta, \Theta]_{2.n}$

$[t, \tau, \theta, \Theta]_{3.n}$

$[t, \tau, \theta, \Theta]_{4.n}$

Task 0

Task 1

Task 2

Task 3

Task 4

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

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To identify the **logos block** of the research praxeology in the corpus

Methodology in our Research Praxeology



Results: Research praxeologies in the ATD community

Task 0

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

Task 1

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

Task 2

To identify the **types of tasks** of the research praxeology in the corpus

Task 3

To identify the **techniques** of the research praxeology in the corpus

Task 4

To identify the **logos block** of the research praxeology in the corpus

Task 1: Build a corpus

Task 1: Build a corpus

$[t, \tau, \theta, \Theta]_{1..n}$



Task 0

Task 1

Task 2

Task 3

Task 4

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

To identify the **types of tasks** of the research praxeology in the corpus

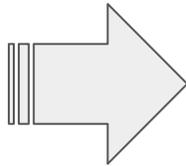
To identify the **techniques** of the research praxeology in the corpus

To identify the **logos block** of the research praxeology in the corpus

Task 1: our technique

Task 1

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught



Technique of Task 1 :

Task 1.1: Identify the publication sources of research in ATD.

Task 1.2: Select articles addressing curricular issues related to the works to be taught.

Task 1.1: Identify the publication sources

Technique of Task 1.1 :

Use the main publication sources of research within the ATD community

We have chosen to limit ourselves to sources that have exclusively published within the ATD community: the proceedings of CITAD conferences and thematic book volumes.

In total, 9 sources have been considered:

- Proceedings of CITAD 1 to CITAD 7
- Two book volumes
 - Bosch, M., Chevallard, Y., García, F. J. & Monaghan, J. (Eds.) (2019). *Working with the anthropological theory of the didactic in mathematics education. A comprehensive casebook*. Routledge.
 - Chevallard, Y., Barquero, B., Bosch, M., Florensa, I., Gascón, J., Nicolás, P., & Ruiz-Munzón, N. (Eds.) (2022). *Advances in the Anthropological Theory of the Didactic*. Springer International Publishing.

Task 1.1: Identify the publication sources

Technique of Task 1.1 :

Use the main publication sources of research within the ATD community

CITAD1	CITAD2	CITAD3	CITAD4	CITAD5	CITAD6	CITAD7	Working with ATD (2019)	Advances in ATD (2022)	Total
36	41	41	44	36	60	52	13	27	350

Task 1.2: Select target articles

Our target: articles addressing **curricular issues related to the works to be taught.**

Alpha technique

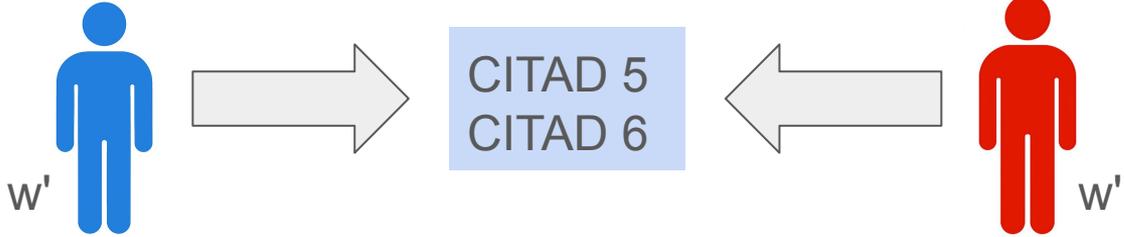
Keywords: *curriculum, textbooks, programs, noosphere, knowledge to be taught, works, comparison of educational systems, dominant model*

I. Title Reading	1	2	3
II. Abstract Reading	1	2	3
III. Full Article Reading	1	2	3
IV. Discussion between w' and w''	1	2	

- 1) Retained: it explicitly uses the keywords from the defined universe.
- 2) Excluded: it explicitly addresses a subject deemed peripheral.
- 3) Indeterminate: it does not allow a clear determination of the article's relevance to the field of study.

Task 2.1: Reliability of *Alpha* technique

An exercise



I. Title Reading	1	2	3
II. Abstract Reading	1	2	3
III. Full Article Reading	1	2	3

Blue arrows point from the '3' cell in the first row to the '1' cell in the second row, and from the '3' cell in the second row to the '1' cell in the third row.

- This exercise highlighted two different behaviors on the part of w' and w'' :
 - To make a decision, w' had to go to step III about three times more often than w'' .
 - Different decisions were found in a significant proportion of cases (approximately 20%).

Alpha technique is not reliable! But why?

Task 2.1: Observations of *Alpha* technique

I. Title Reading

II. Abstract Reading

- 1) Retained: it explicitly uses one or more keywords from the defined universe.
- 2) Excluded: it explicitly addresses a subject deemed peripheral.
- 3) Indeterminate: it does not allow a clear determination of the article's relevance to the field of study.

Taking too
high a risk !

In most cases!

- Absence of uniformity : we don't always find the same information ;
- A substantial discrepancy exists between the objectives of the research project and the paper.
- When an article was written in a less familiar language : “Did I understand correctly? ”

Task 2.1: Hypotheses on *Alpha* technique



w'

A: {curriculum, textbooks, programs, noosphere, knowledge to be taught, works, comparison of educational systems, dominant model}



w''

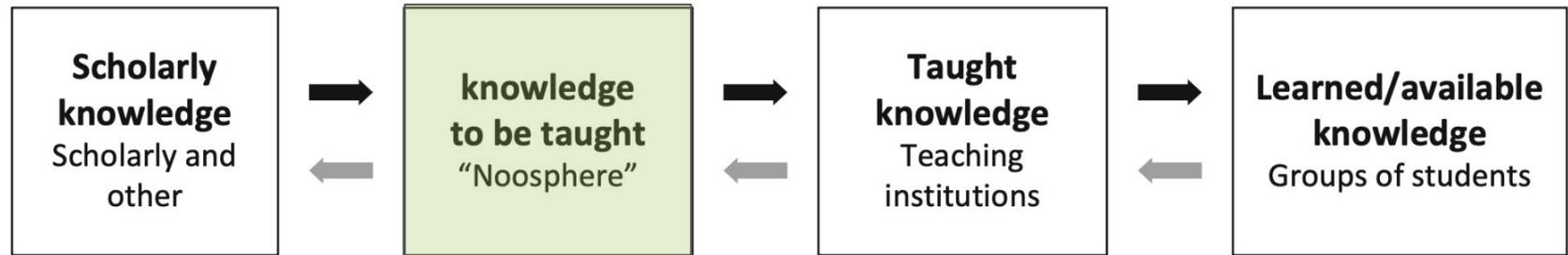
Hypothesis 1 : $R(w', A) \cong R(w'', A)$

Hypothesis 2 : for $w \vdash R(r, A)$, $R(w', R(r, A)) \cong R(w'', R(r, A))$

The *judgments* made by w' and w'' regarding the research presented in the article (with r denoting the researcher) are not identical.

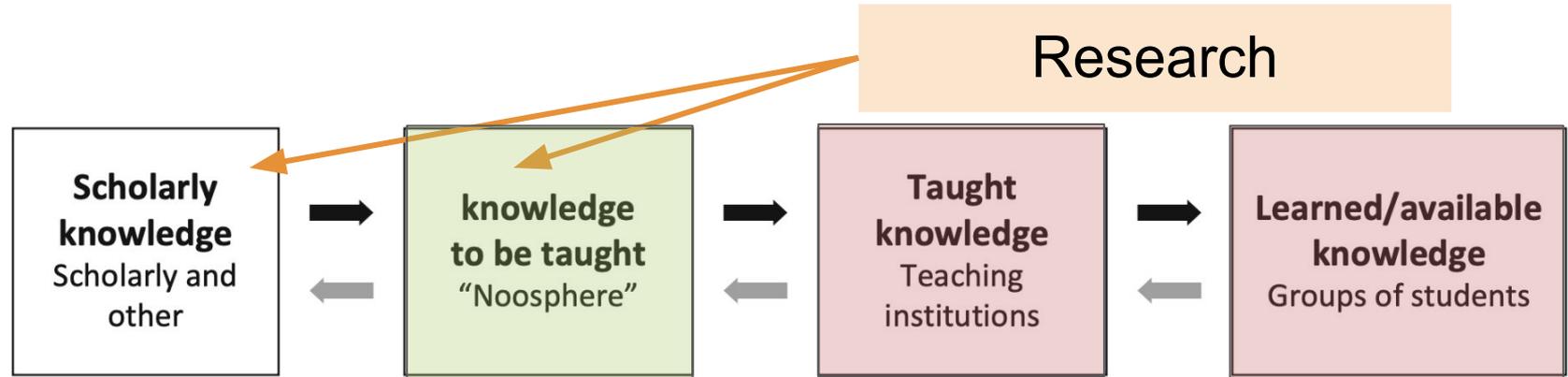
Task 1.2: Development of our technological environment

Need for the development of **a common technological environment** to improve the technique to select articles addressing curricular issues related to the works to be taught.



“External didactic transposition : Where scholarly knowledge [...] is selected, adapted and declared as "matter to be taught", resulting in documents such as syllabi, textbooks and other resources and regulations for teaching.” (Bosch et Winsløw, CITAD 6)

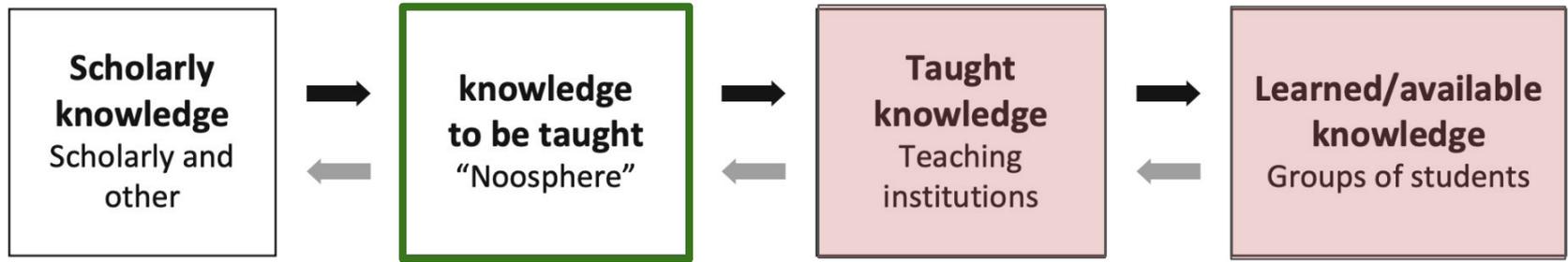
Task 1.2: Decision on the didactic transposition



Exemple

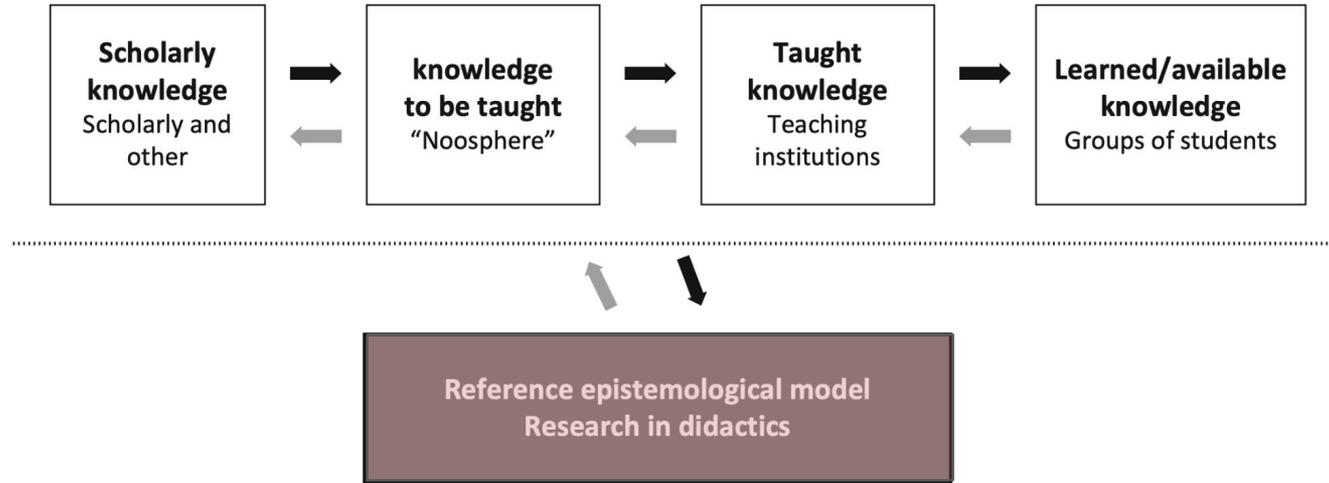
Molinas and Gonzales (2024) – CITAD 7, considered the possibility of implementing a didactic engineering approach. The article focuses primarily on the first phase (preliminary analysis), in which the researchers carry out a 'documentary analysis' of several books frequently used in higher education. This analysis makes it possible to access a kind of dominant model of what is expected to be taught.

Task 1.2: Decision on the didactic transposition



- ❖ Articles that use and analyze the prescribed curriculum only incidentally, as contextual data for the research problem, are excluded.

Task 1.2: Decision on the epistemological model



- ❖ Epistemological analyses of knowledge explicitly shed light on the works to be taught, but also on all other phases of didactic transposition.
- ❖ The articles that only aim to present an epistemological model were not considered in our corpus.

Task 1.2: some decisions

Exclude prospective studies

- Theoretical or experimental research on alternative curricula (or elements of curricula), understood as regulations of how the study of works is organised in a given school system, are not considered in our study.

Limit the types of institutions

- We restrict our analysis to official school didactic systems, from kindergarten to higher education. Curricula developed by continuing education institutions or museums, for example, are not considered in our study. This choice is admittedly arbitrary but is justified by the fact that it helps reduce the complexity of the article selection process.

Task 1.2: *Beta* technique

The beta technique reproduces the gestures of the Alpha technique, but the classification of articles is based on more explicit criteria, **even if the judgments coming from w' and w'' always involve non-public technological elements.**

- 1) Retained
 - 2) Not retained
 - 3) Indeterminate: it does not allow a clear determination of the article's relevance to the field of study.
- 

It focuses primarily on the knowledge to be taught, and the observables are drawn from products of the noosphere that are representative of the dominant model of one or more institutions at a given time (curricula, textbooks, official documents, etc.).

- **The emphasis placed on this analysis is considered significant**
- **The work or works to be taught are identifiable**
- **The institution is identifiable**

Task 1.2: *Beta* technique

The beta technique reproduces the gestures of the Alpha technique, but the classification of articles is based on more explicit criteria, **even if the judgments coming from w' and w'' always involve non-public technological elements.**

- 1) Retained
 - 2) Not retained
 - 3) Indeterminate: it does not allow a clear determination of the article's relevance to the field of study.
- 

The paper **explicitly** aims to develop theoretical concepts and methodological aspects related to curricular questions concerning the works to be taught.

(Any theoretical or methodological article can potentially provide concepts and tools useful for the analysis of the works to be taught. However, we consider only those that explicitly have this as their objective.)

Results of Task 1.2: Selected articles

CITAD1	CITAD2	CITAD3	CITAD4	CITAD5	CITAD6	CITAD7	Advance courses: 2019	Working with ATD: 2020	Total
36	41	41	44	36	60	52	27	13	350
4	10	6	7	7	10	8	1	1	54

Task 2: Identify the types of tasks

Task 2: Identify the types of tasks

$[t, \tau, \theta, \Theta]_{2..n}$

Task 0

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

Task 1

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

Task 2

To identify the **types of tasks** of the research praxeology in the corpus

Task 3

To identify the **techniques** of the research praxeology in the corpus

Task 4

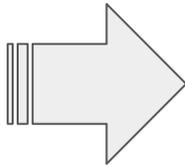
To identify the **logos block** of the research praxeology in the corpus

Task 2: our technique (to identify types of tasks)

“[...] the types of tasks are mainly composed of the research questions and problems approached.” (Artigue & Bosch, 2014, p. 251)

Task 2

To identify the **types of tasks** of the research praxeology in the corpus



Technique of Task 2 :

Task 2.1: Categorize the articles according to types of tasks of the regional level.

Task 2.2: Characterize each study in terms of the institutional relation to the work ($R_1(e; o)$), when specified in the articles.

Task 2.3: Characterize each study only in articles with theoretical or methodological contributions.

Task 2.1: our technique (to categorize the articles)

Technique of Task 2.1 :

We identify the types of tasks at the regional level of research praxeologies. We did not have a reference model with types of tasks that is defined a priori. The types of tasks presented here were therefore described a posteriori. However, the technological environment of ATD could probably have enabled us to identify most of these types of tasks in advance.

	{Discipline: Didactics}	
<i>Global praxeologies</i>	{Domain: ATD}	
<i>Regional praxeologies</i>	{Sector: Study of works to be taught}	$\sum \sum \sum [T_{ijk} / \tau_{ijk} / \theta_{jk} / \Theta_k]$
<i>Local praxeologies</i>	{Theme}	$\sum \sum [T_{ij} / \tau_{ij} / \theta_j / \Theta]$
<i>Pinpoint praxeologies</i>	{Subject}	$\sum [T_i / \tau_i / \theta / \Theta]$
		$[T / \tau / \theta / \Theta]$

Results of Task 2.1: Five regional types of tasks

T1) To study **the works to be taught** at a given time within an institution *I*.

T2) To study **conditions and constraints** related to the works to be taught at a given time within an institution *I*.

T3) To develop **theoretical contributions** in ATD for the study of phenomena related to the works to be taught.

T4) To develop **methodological contributions** in ATD for the study of phenomena related to the works to be taught.

T5) *Others*

T1	T2	T3	T4	T5
42	12	3	6	1

One article of T5 studies the transposition of a research praxeology about a work to be taught (physics) for teacher training.

“Epistemological vigilance and textbooks: On the didactic transposition of physics knowledge” (Ricardo & Pietrocola, CITAD 3)



Task 2.2: Characterize each study of T1 and T2

Technique of Task 2.2:

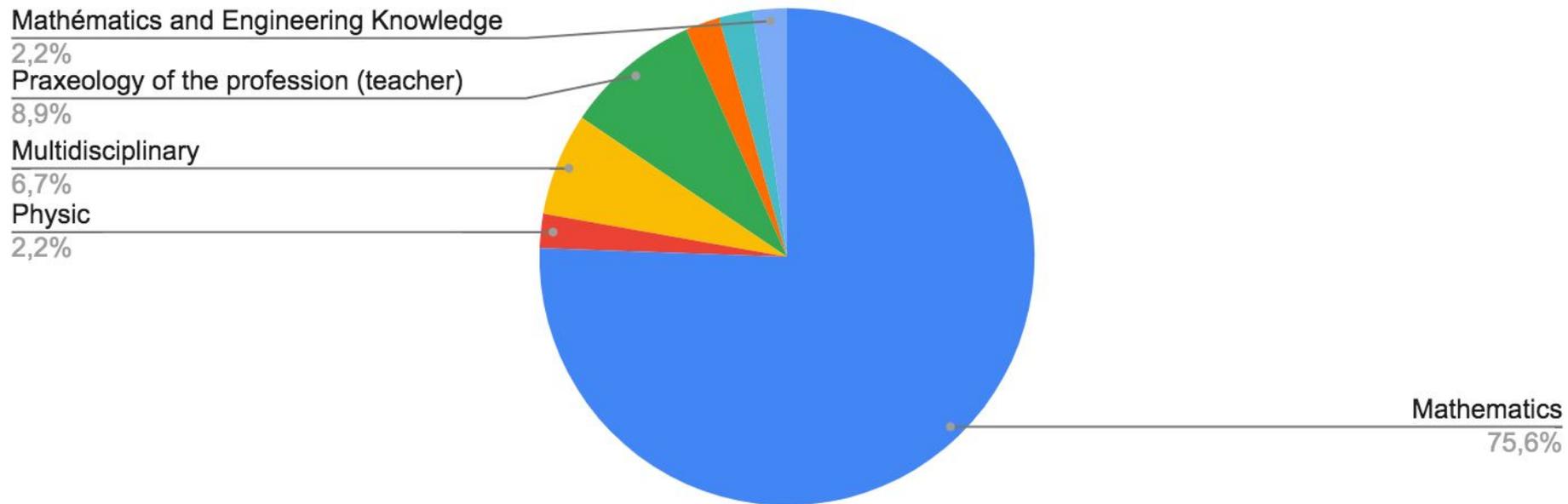
- Identify the elements that constitute the works to be taught or $R_I(e; o)$: discipline and domain of the works, the type of institutions, and the time frame

T1) To characterize **the works to be taught** at a given time within an institution I .

T2) To study **conditions and constraints** related to the works to be taught at a given time within an institution I .

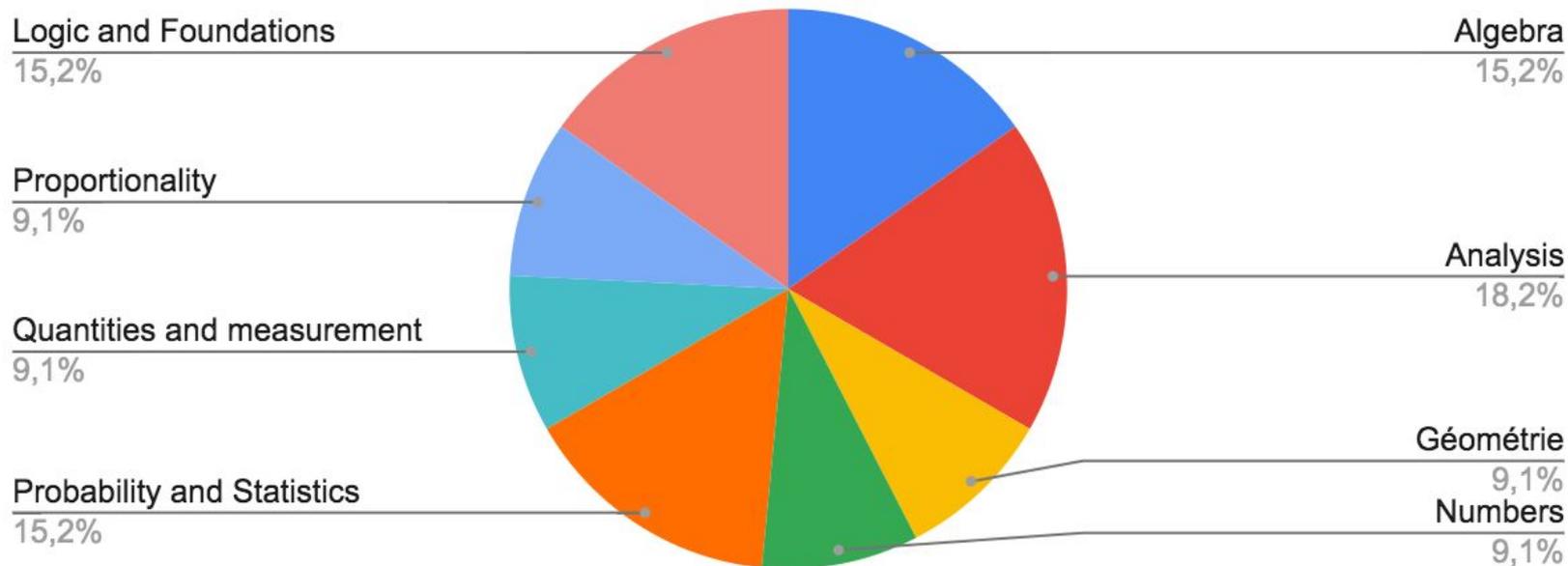
Works	Institutions	Time
<ul style="list-style-type: none">- Disciplinary work- Professional work	<ul style="list-style-type: none">- Educational level- Country	<ul style="list-style-type: none">- Current- Past

Results of Task 2.2: disciplines of works to be taught

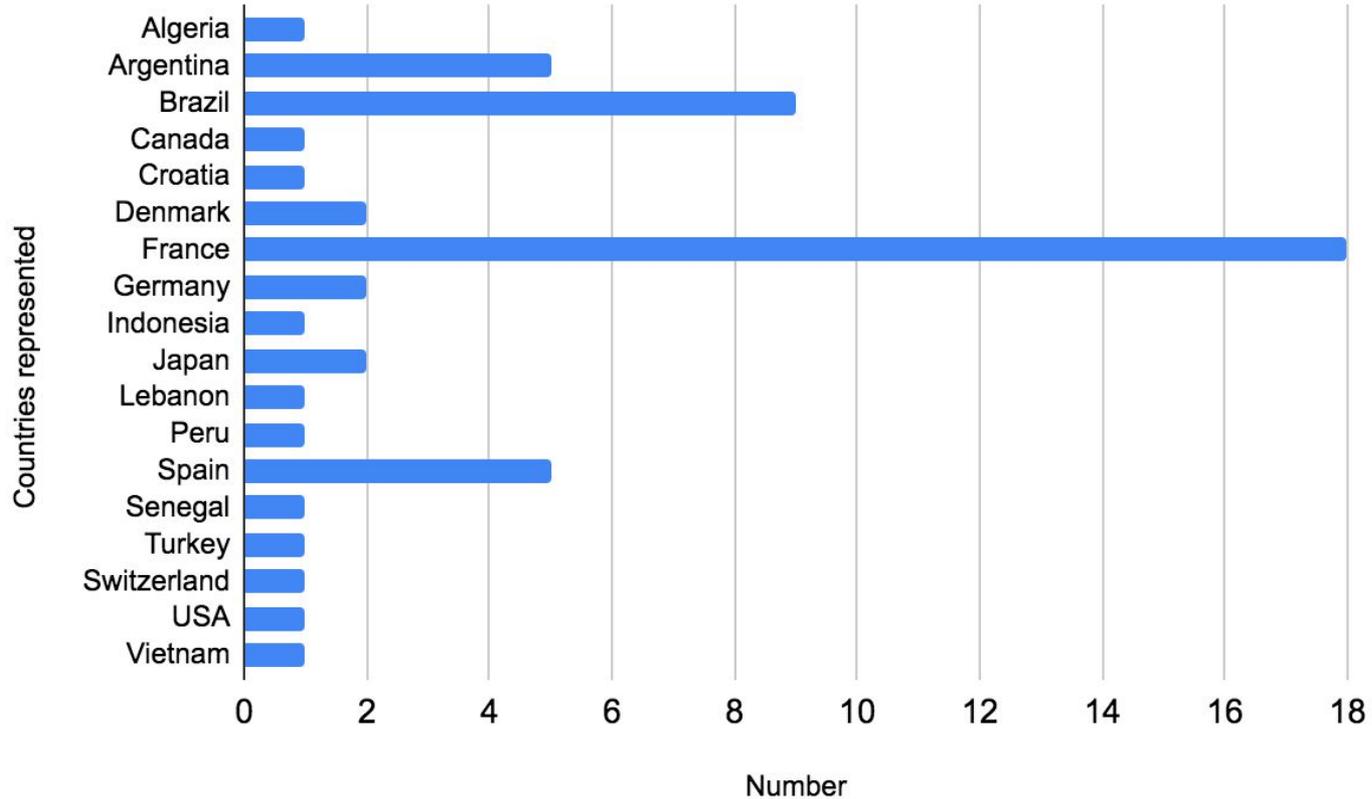


Results of Task 2.2: domains of mathematical works

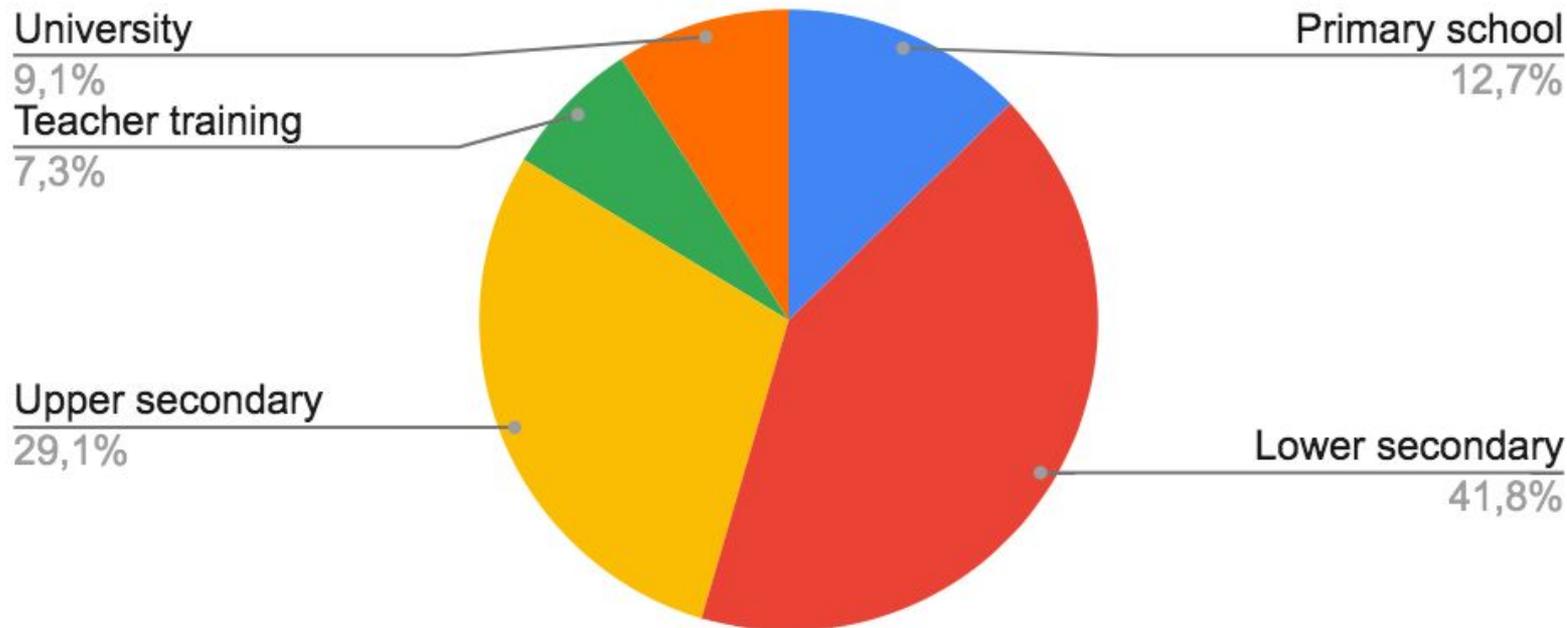
Mathematics :



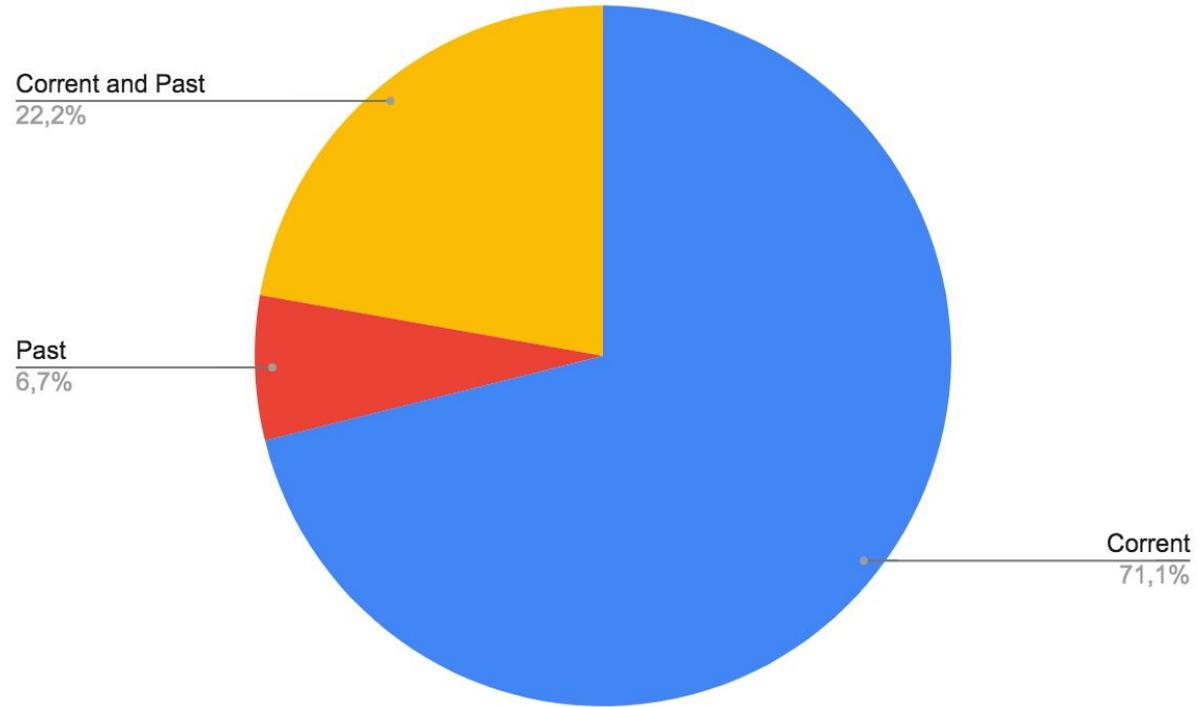
Results of Task 2.2: institutions (countries)



Results of Task 2.2: institutions (levels)



Results of Task 2.2: time frame



Task 2.3: Characterize each study of T3 and T4

Technique of Task 2.3:

- Characterize the studies of T3 and T4 in terms of the research praxeology.
- Examine each article and identify which aspect of the research praxeology it contributes to developing.

T3) To develop **theoretical contributions** for the study of phenomena related to the works to be taught.

T4) To develop **methodological contributions** for the study of phenomena related to the works to be taught.

Theoretical or methodological articles

T3: 3 articles

T4: 6 articles

Results of Task 2.3: Characterize each study of T3 and T4

T3 contributes to **the logos block** of the research praxeology through theoretical development, articulation, and reorganisation of specific aspects or phenomena related to curricular issues.

❖ Curricula related to Questioning the world

- “Paradigmas didácticos y reforma curricular: el caso de la teoría antropológica de lo didáctico” (Gascón & Nicolás, CITAD 6)
- “What is Questioning the World? Towards an Epistemological and Curricular Break” (Chevallard, CITAD 7)

❖ Noosphere related to teacher practice

- “The Paradidactic: A (Would-Be) Fundamental Theory of Noospheres” (Otaki, CITAD 7)

Results of Task 2.3: Characterize each study of T3 and T4

T4 contributes to **the praxis block** of research praxeology through the development of analytical methods or tools for investigating phenomena related to curricular issues.

- ❖ Proposition of a method/procedure of analysis (types of tasks or techniques):
 - “L’analyse du rôle des manuels dans l’approche anthropologique” (Chaachoua & Comiti, CITAD 2)
 - “Une proposition pour l’analyse de manuels” (Bittar, CITAD 6)
 - “Relations entre deux institutions noosphériennes : effets d’un système d’évaluation de manuels didactiques” (Kaspary, CITAD 6)
 - “The external didactic transposition of mathematics at the university level: dilemmas and challenges” (Bosch & Winslow, CITAD 6)
 - “The Analysis of Dominant Praxeological Models with a Reference Praxeological Model: A Case Study on Quadratic Equations” (Chaachoua et al., Advances)
- ❖ Proposition of an analytical tool that can be used in the techniques
 - “Un modèle de description de ressources, basé sur des critères didactiques et inscrit dans une perspective EIAH” (Jollivet, CITAD 6)

Task 3: Identify the techniques

Task 3: Identify the techniques

[t, τ, θ, Θ]_{3.n}

Task 0

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

Task 1

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

Task 2

To identify the **types of tasks** of the research praxeology in the corpus

Task 3

To identify the **techniques** of the research praxeology in the corpus

Task 4

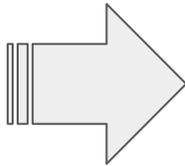
To identify the **logos block** of the research praxeology in the corpus

Task 3: our technique (to identify techniques)

“The *techniques* correspond to the different possible “ways of doing” that can be used to carry out a task of a given type”
(Artigue & Bosch, 2014, p. 251)

Task 3

To identify
the
techniques of
the research
praxeology in
the corpus



Technique of Task 3 :

Only for
T1 and T2

Task 3.1: identify the conceptual/technological tools used.

Task 3.2: identify the resources and/or data used or analysed.

Task 3.1: Identify the technological tools

Technique of Task 3.1:

- Identify, in each article, theoretical notions that are explicitly stated or used as tools for analysis.

Technology

- “For the researcher, theories are above all tools that respond to needs.” (Artigue, 2020, p. 72, our translation)

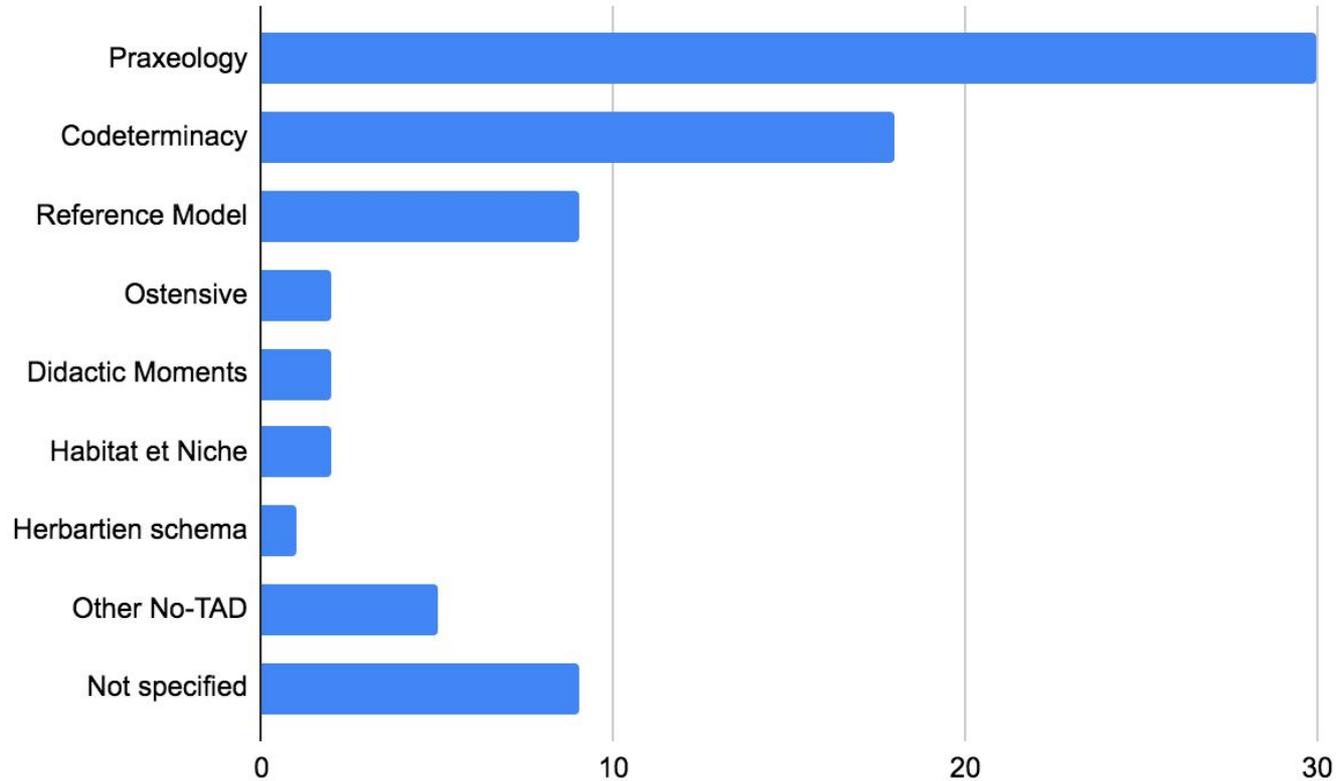
T1) To characterize **the works to be taught** at a given time within an institution *I*.

T2) To study **conditions and constraints** related to the works to be taught at a given time within an institution *I*.

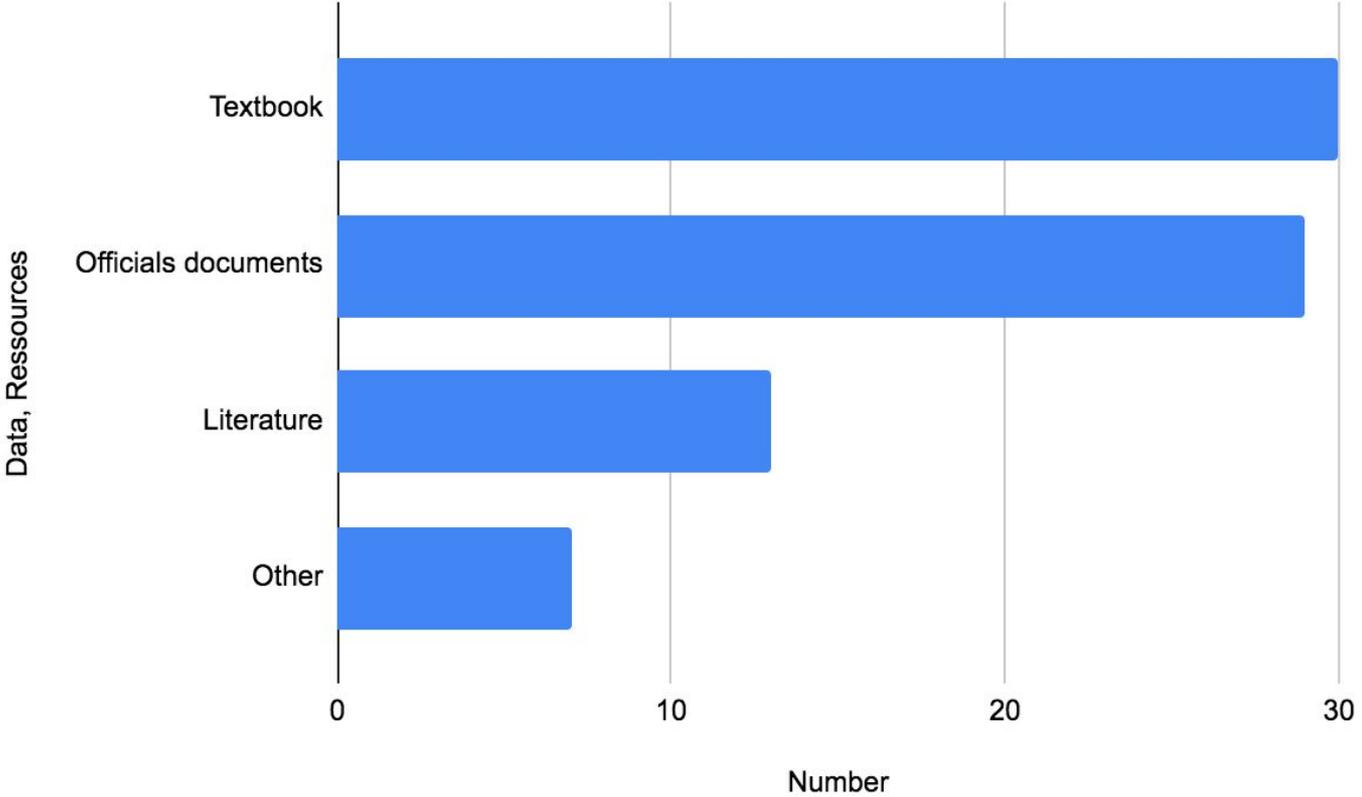
Task 3.1 and 3.2: Identify tools and resources/data

	A	B	C	D	F	G	H	I	J	K
1	Source	Authors	Title	Paç	Type	œuvres à ens	Institution d'enseign	Descriptive	Data, resources	Tool
	CITAD4	Anne Crumière	probabilités	785	T1 et T2	Probability	Grade 9 / France	Descri...	Textbook	moments
29	CITAD5	Dyana Wijayanti	Linking proportionality of arithmetic, algebra and geometry domains in Indonesian lower secondary textbooks	74	T1	Mathématiques / Proportionality	lower secondary / Indonésie	Descri...	Textbook	Praxeology / Codeterminacy
30	CITAD5	Koji Otaki	Frequentist probability in Japanese school curricula	100	T1 et T2	Mathématiques / Probability	Lower secondary school / Japan	Descri...	Textbook	Praxeology / Reference model / Codeterminacy
31	CITAD5	Jean-Marcel Strock, Michèle Artaud	Du logos des organisations algorithmiques dans l'enseignement secondaire	185	T1	Mathématiques / Algorismics	Upper secondary school / France	Descri...	Official document / Other (exam)	Praxeology
32	CITAD5	Míriam do Rocio Guadagnini, Marlene Alves Dias	Factorisation des polynômes. Une étude basée sur le développement d'un PER	201	T1	Mathématiques / Calculation of polynomials	Upper and lower secondary schools / Brasil	Descri...	Official document / Textbook	Praxeology / Reference model
33	CITAD5	Marlene Alves Dias, Sirlene Neves de Andrade, Tânia Maria Mendonça Campos	La notion de fonction : les praxéologies prescrites pour être enseignées lors de l'articulation entre le collège et le lycée à São Paulo	298	T1	Mathématiques / Function	Secondary schools (14-15 years old) / Brasil	Descri...	Official document / Textbook (including workbooks)	Praxeology / Ostensive / Codeterminacy / Others (setting, point of view)
34	CITAD5	Mirène Larguier	Le développement de la pensée algébrique dans le curriculum officiel en France et au Québec	311	T1	Mathématiques / Algebraic thinking	Primary schools / Canadá and France	Descri...	Official document	Reference model / Praxeology
35	CITAD5	José Valério Gomes da Silva, Marlene Alves Dias	Magnitudes y medidas: un recorrido de estudio e investigación para la práctica profesional	370	T1	Mathématiques / Perimeter and area	Secondary schools and professional courses (SENAI - cours technique) / Brasil	Descri...	Official document / Textbook	Praxeology / Ostensive / Codeterminacy / Reference model / Others (setting, point of view)
36	CITAD6	Marilena Bittar	Une proposition pour l'analyse de manuels	54	T4	Not concerned	Not concerned	Not co...	-	-

Results of Task 3.1: technological tools used for T1 and T2



Results of Task 3.2: Identify the resources and data used



Task 4: Identify the logos block

Task 4: Identify the logos block

[t, τ, θ, Θ]_{4.n}

Task 0

To construct the state of the art of research in the ATD community that addresses curricular issues related to the works to be taught

Task 1

To build a **corpus** of articles in the ATD community that address curricular issues related to the works to be taught

Task 2

To identify the **types of tasks** of the research praxeology in the corpus

Task 3

To identify the **techniques** of the research praxeology in the corpus

Task 4

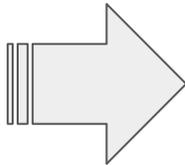
To identify the **logos block** of the research praxeology in the corpus

Task 4: Our technique (to identify the logos block)

“It [theory] is made up of the main principles, notions, and properties that are considered as unquestionable”

Task 4

To identify the **logos block** of the research praxeology in the corpus



Technique of Task 4 :

Task 4.1: Construct a set of ATD concepts

Task 4.2: Systematically identify the emergence of ATD concepts in each article

Results of Task 4.1: a list of ATD concepts

- 1 Didactic transposition
- 2 Institution
- 3 Noosphere
- 4 Institutional/personal relation
- 5 Praxeology
- 6 Ostensive/non-ostensive
- 7 Reference model
- 8 Dominant model
- 9 Ecology
- 10 Habitat and niche
- 11 Codeterminacy
- 12 Raison d'être
- 13 Economy
- 14 Didactic moments
- 15 Monumentalism
- 16 Questioning the world
- 17 SRP
- 18 SRA
- 19 Herbartien schema

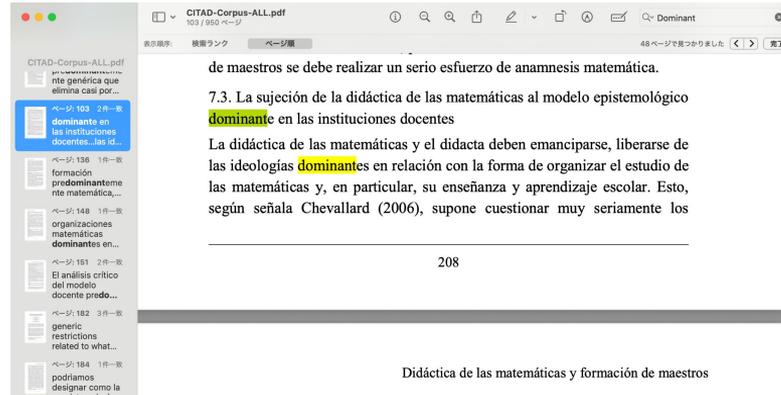
- ❖ We selected ATD concepts based on their frequency of use in studies addressing curricular issues related to the works to be taught.
- ❖ A single term may cover several concepts; for example, praxeology covers types of tasks, techniques, technologies, organisations, praxis, and logos.

Task 4.2: Systematic search (our technique)

- 1 Didactic transposition
- 2 Institution
- 3 Noosphere
- 4 Institutional/personal relation
- 5 Praxeology
- 6 Ostensive/non-ostensive
- 7 Reference model
- 8 Dominant model
- 9 Ecology
- 10 Habitat and niche
- 11 Codeterminacy
- 12 Raison d'être
- 13 Economy
- 14 Didactic moments
- 15 Monumentalism
- 16 Questioning the world
- 17 SRP
- 18 SRA
- 19 Herbartien schema

Technique of Task 4.2

1. Create a single electronic file containing all the articles in the corpus (950 pages).
2. Search for the terms (in English, French, and Spanish) one by one within this file.
3. Identify articles according to the following criteria:
 - The term is used in the sense of an ATD concept;
 - The term is used in the body text (not only in citations or footnotes)

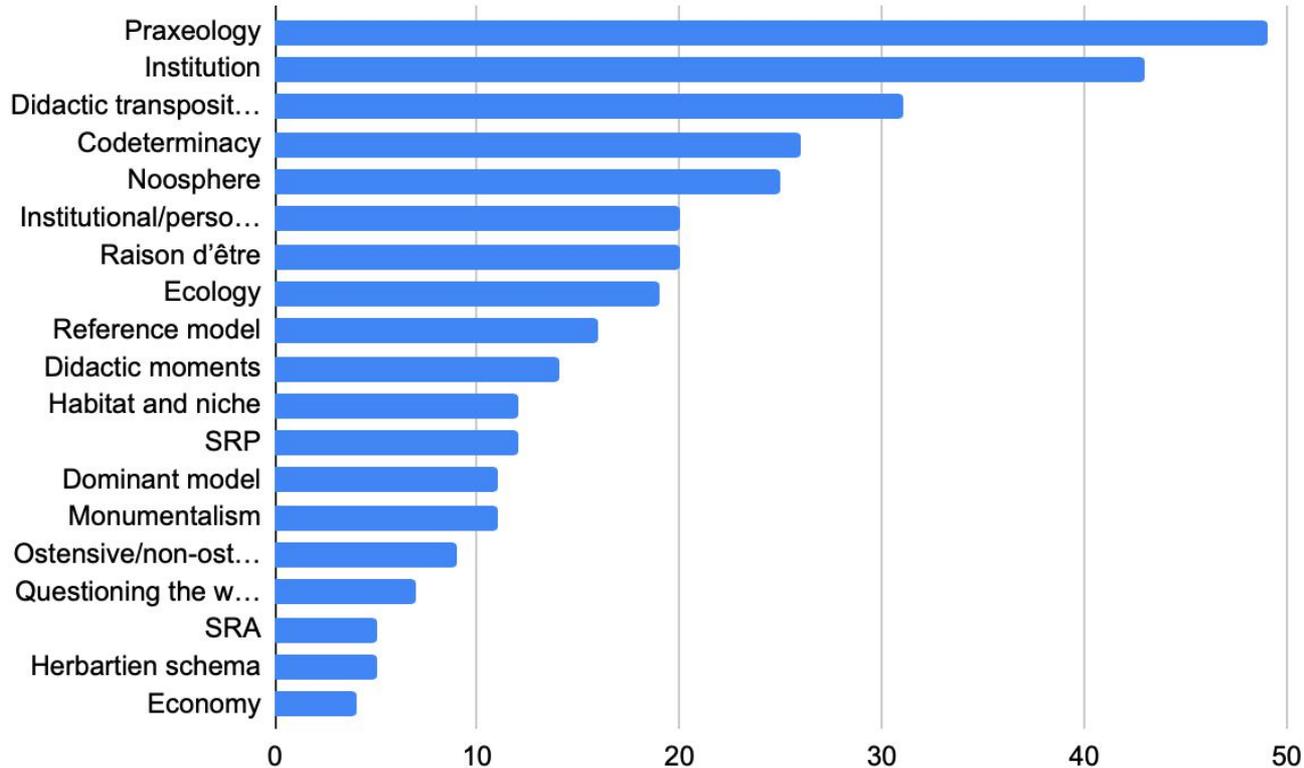


Results of Task 4.2: ATD concepts in Research Praxeologies



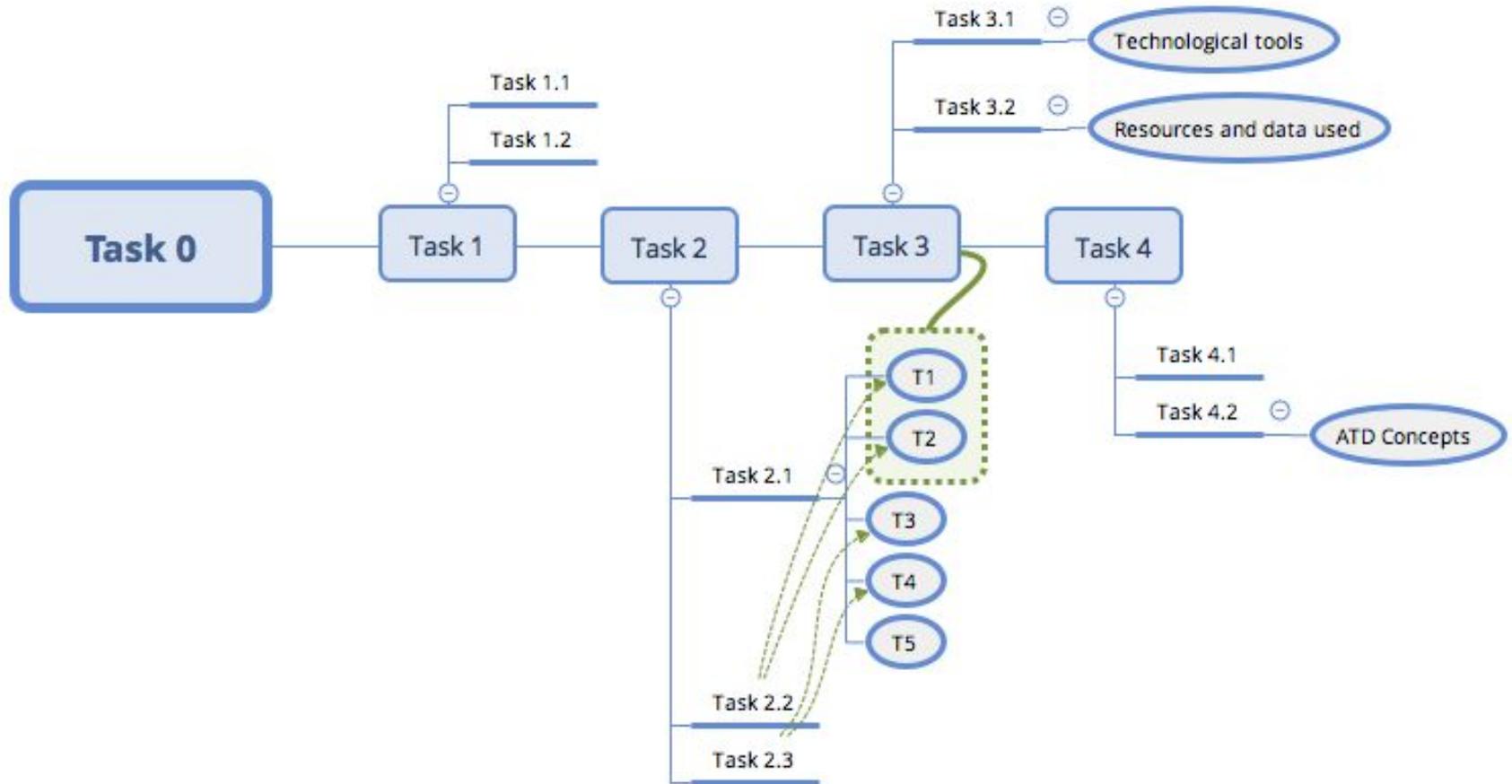
(Frequencies by a text mining tool)

Results of Task 4.2: ATD concepts in Research Praxeologies



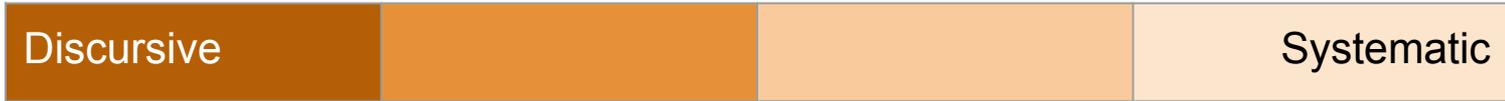
Discussion and conclusion

Organisation of our research praxeology



Diversity of research practices and type of articles

Communication



Research technique



Support



Adherence to ATD



Diversity of research practices and type of articles

Communication

Discursive

The article is structured around a guiding thread chosen by the researcher (this does not mean that the structure reflects the path actually taken by the researcher)

Systematic

The article is structured as follows:

- Introduction
- Theoretical framework
- Methodology
- Results
- Discussion

Research technique

Invisible

Visible

Diversity of research practices and type of articles

Support

Resources

Empirical data

(Bourgade et al., 2024) - CITAD 7

(Llanos & Otera, 2024) - CITAD 7

1.1 Experimentation and Theorization in Textbooks: An Example

Textbooks are only one material, among others, to be used most teachers use them as resources to select exercises also use them to design “introductory activities” or the on students’ notebooks. We choose here to study a text next to the praxeological components presented (Wijayar clues of possible organizations of their study. The aim is technological-theoretical environment related to probabil tracks provided for the realization in class of the moment technological-theoretical environment (Chevallard, 1999). presentation in a textbook of an experimental protocol.

Activités

2 Une histoire de pensée

Objectif Faire les liens entre fréquence et probabilité.

Lorsque l'on lance une pièce de monnaie bien équilibrée, on sait d'avance que l'on a une chance sur deux d'obtenir pile et une chance sur deux d'obtenir face. Mais dans certaines situations, on se console pas la probabilité théorique. C'est dans l'eau d'aujourd'hui !

On lance en fait une pièce plate. Cette pièce peut tomber soit sur la pile, soit sur la face.

On souhaite déterminer la probabilité qu'une pièce tombe sur la pile. Pour ce faire, on lance la pièce et on note le résultat dans la colonne correspondante du tableau ci-dessous.

Nombre de lancers	Nombre de piles	Total
10	5	10

Partie B Mise en contexte

On veut en connaître les résultats en complétant la colonne B du tableau ci-dessous.

Nombre de lancers	Nombre de piles	Nombre de faces	Nombre de lancers consécutifs	Probabilité théorique
10	5	5	10	0,5
20	10	10	20	0,5
30	15	15	30	0,5
40	20	20	40	0,5

Partie C Analyse des résultats

- Compléter les cellules B1, B2 et B3.
- En B1, quelle formule pose en écrit et doit être complétée la colonne B ?
- En B2, quelle formule pose en écrit et doit être complétée la colonne B ?
- En B3, quelle formule pose en écrit et doit être complétée la colonne B ?
- Tracer le graphique des fréquences cumulées en fonction du nombre de lancers consécutifs.

Notes Le nombre de lancers consécutifs, que l'on pose en écrit, est le nombre de lancers consécutifs obtenus.

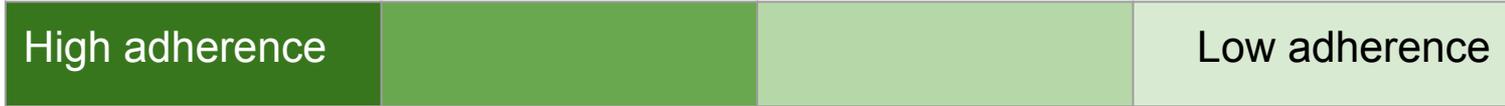
2 Methodology

188 math textbooks for the secondary level published between 1940 and 2020 are intentionally selected. The books are classified according to the criteria that contemplates the period of their first edition; and four periods related to substantial changes in curricular designs and educational reforms in Argentina are generated:

- Period 1, 20 texts edited between 1940 and 1973;
- Period 2, 34 texts edited between 1974 and 1994,
- Period 3, 84 texts edited between 1995 and 2007,
- Period 4, 49 texts edited between 2008 and 2020.

Diversity of research practices and type of articles

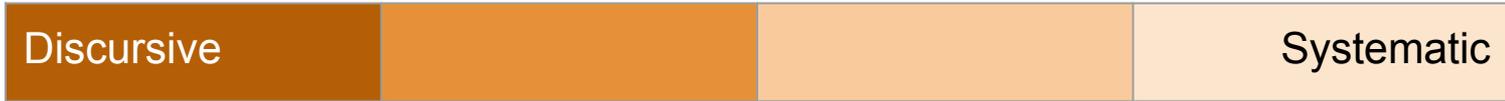
Adherence to ATD



- Observations on the logos block in the corpus
 - 339 occurrences of ATD concepts across 54 articles (mean = 6.27; SD = 2.61)
- The extent to which the study reported in each article relies on the ATD framework varies considerably:
 - 4 articles among 54 use more than 10 kinds of ATD concepts.
 - 4 articles use only 2 ATD concepts; praxeology is used without institution.

Diversity of research practices and type of articles

Communication



Research technique



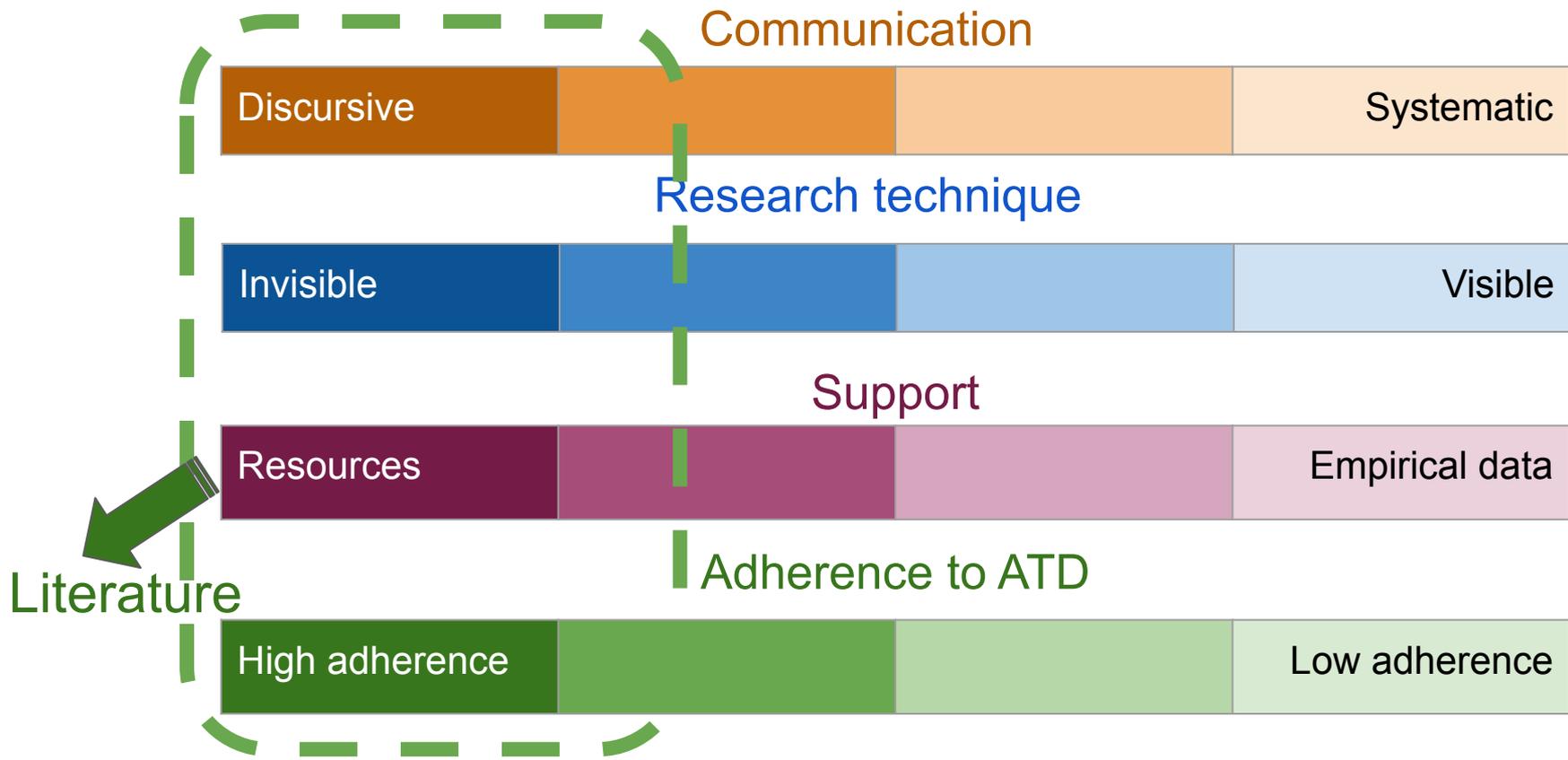
Support



Adherence to ATD



Articles of T3 and T4



Conclusion and questions

Summary of the results

- With respect to the internationalisation of the community, some countries are far more represented than others.
- Praxeology is the main tool used to model dominant models, and current dominant models attract more interest than past ones.
- Mathematics is the most represented discipline.
- The paradigm of questioning the world is rarely mentioned.
- Lower and upper secondary education are the most frequently studied levels.

Questions regarding the diversity of $R_{\Delta}(r, Q)$ (not $R_I(e; o)$)

- What research practice is legitimate or expected?
- What institutional positions exist?
- What theme/question is legitimate or expected?
- What degree of adherence to ATD is expected? (conformity of $R(w, \Theta)$ to $R_{\Delta}(r, \Theta)$?)
- How and to what extent do the research practices in other research institutions ($R_{\Delta}(r', Q')$) affect our research practices?

References

- Artigue, M. (2020). Networking de theories : enjeux, conceptualisation et pratiques. In A. Chesnais & H. Sabra (Eds.) *Actes du séminaire de didactique des mathématiques de l'ARDM – année 2020* (pp. 68-87). ARDM.
- Artigue, M., & Bosch, M. (2014). Reflection on Networking Through the Praxeological Lens. In A. Bikner-Ahsbahr & S. Prediger (Eds.), *Networking of Theories as a Research Practice in Mathematics Education* (pp. 249-265). Springer International Publishing. https://doi.org/10.1007/978-3-319-05389-9_15
- Chevallard, Y. (2007). Omettre ou transmettre ? Les choix curriculaires et leurs enjeux. Exposé présenté à la IXe école d'été de didactique des mathématiques (Houlgate, 19-27 août 1997). Paru dans les actes, ARDM, s.l.n.d., p. 78-90.
- Chevallard, Y. (2017). Observer le didactique : quoi ? comment ? et pourquoi ? Notes issues d'un exposé présenté à Toulouse le jeudi 19 octobre de l'UMR éducation, formation, travail, savoirs (EFTS), dans le cadre conjoint de l'université. Toulouse Jean Jaurès et de l'école Nationale Supérieure de Formation de l'Enseignement Agricole (ENSFEA).
- Chevallard, Y., & Bosch, M. (2019). A short (and somewhat subjective) glossary of the ATD. In M. Bosch, Y. Chevallard, F. J. García, & J. Monaghan (Eds.), *Working with the anthropological theory of the didactic in mathematics education. A comprehensive casebook* (pp. xviii-xxxvii). Routledge.
- Wozniak, F. (2005). *Conditions et contraintes de l'enseignement de la statistique en classe de seconde générale. Un repérage didactique*. Thèse de doctorat, Université Lyon 1, Lyon. [En ligne](#).