MIRA

Metacognition · Interiority · Resilience · Agency

Teaching-Learning Model

Technical reference document

For leadership teams and pedagogical coordinators
Schools in the process of implementing the MIRA model

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Contents

I. What the MIRA Teaching-Learning Model is

The MIRA Teaching-Learning Model —articulated in four interdependent conditions: Metacognition, Interiority, Resilience and Agency— is not an assessment system. Assessment is a consequence of the model, not its purpose. Nor is it a one-off training programme or a methodology added to the existing curriculum: it is the internal architecture that organises how teaching and learning take place in the classroom.

Each condition of MIRA operates on two planes that should not be confused: as a condition, it asserts what makes deep learning possible; as an object of assessment, it is recorded through the degree to which it becomes visible in the student's evidence (A–D criteria; YES/PARTLY/NO). The condition lives in the design of the unit; the degree, in the evidence.

> *What makes MIRA systemic is that it works in two directions that continuously feed back into each other: the teacher direction (what is designed in each condition) and the student direction (what is done in each condition). Both travel the same cycle. What the student produces on each turn generates evidence that informs the teacher's design on the next.*

The two directions of the cycle

Each condition has an expression in the teacher direction and an expression in the student direction. The teacher's design determines what is possible for the student; the student's response informs how the design must evolve. Neither direction makes sense without the other.

	Teacher direction — what does it design?	Student direction — what does it do?
M	Designs tasks that require planning before acting, monitoring during the process and adjusting the strategy if it does not work. It includes explicit questions about the process, not only about the product.	Reflects on how they are learning. They ask which strategy they are using, whether it is working and what they would change. They adjust without waiting for the teacher to point out the error.
Metacognition		
I	Generates moments where the content can be connected with the student's experience, interests or personal questions. It does not impose the connection: it creates the space for it to happen.	Pauses and asks why what they are learning matters to them. They identify what arouses their curiosity, resistance or enthusiasm. They put that connection into words in a journal, a written reflection or a conversation.
Interiority		
R	Designs tasks with real and unavoidable difficulty: problems without a single solution, projects with foreseeable obstacles, situations where the first attempt is insufficient by design.	Confronts difficulty without avoiding it. Manages error as information, not as failure. Persists, looks for alternatives and regulates their emotional state when blocked.
Resilience		

A	**Teacher direction — what does it design?** Designs authentic products with real decisions: the student chooses, decides and produces something that has consequences beyond the classroom or for others. The task cannot be completed without real autonomy.	**Student direction — what does it do?** Acts without waiting for instructions. Makes their own decisions about the process and the result. Produces something that was not there before: an object, an intervention, a solution, an argument.
	Agency	

The feedback loop: how the system self-regulates

The model is systemic because it has explicit feedback loops. The closing point of the loop is always condition A: the student's authentic product is the most complete evidence that the cycle has worked. If A is simulated —if there are no real decisions or authentic consequences— the loop does not close and the system does not learn.

What the system generates	What sustains it
The student completes condition A (produces something real) → that evidence feeds back into the teacher's M for the next cycle: did the design generate enough autonomy? What do I adjust? The student's self-assessment in each condition informs the teacher in real time, without waiting for the final assessment.	The teaching team periodically reviews whether the four conditions are present in their planning or whether any is systematically weak. Improvement is not one-off but structural: each cycle leaves evidence that allows patterns to be compared, identified and pedagogical decisions to be made with real data.

II. Why it arises: a response to current conditioning factors

MIRA does not arise as a theoretical proposal detached from context. It arises as a response to a precise diagnosis: there are four external factors that the school cannot control but can address, and that structurally hinder students from developing capacities for deep and lasting learning.

The four conditioning factors of the environment

Conditioning factor	Expression in the student	What it blocks
① Digital immediacy	Difficulty sustaining prolonged effort. Pursuit of immediate gratification. Low tolerance of boredom and uncertainty.	Blocks perseverance and Agency: the student cannot act with sustained autonomy if they do not tolerate delay.
② Family overprotection	Avoidance of error and failure. The student arrives in the classroom without having learned to manage difficulty or to make decisions with real consequences.	Blocks Resilience and Agency: without the experience of managed error, the student cannot be a transformer.
③ Low tolerance of failure	Error is experienced as a threat to identity, not as information. Frustration generates withdrawal, not a revision of strategy.	Blocks Metacognition: a student who avoids error cannot reflect on their own learning process.
④ Emptiness of meaning	A culture of immediacy and surface leaves the student without a vital anchor: lack of purpose, unwanted loneliness and growing anxiety.	Blocks Interiority: without a connection between knowledge and one's own life, learning neither takes root nor generates commitment.

The model's response: four conditions, four conditioning factors

MIRA operationalises the school's response to these four conditioning factors. It does not seek to eliminate the environment —that is not possible— but to compensate for it structurally through pedagogical design.

Condition	Name	Conditioning factor it answers	Implication for design
M	Metacognition	Digital immediacy	The teacher's design includes deliberate cognitive friction: tasks without a direct solution, open problems, explicit reflection on the process. It is not enough for the student to produce; they have to know how they produced it.
I	Interiority	Emptiness of meaning	The model creates spaces where the student connects knowledge with their own life, their questions and their purpose. Interiority is the pedagogical antidote to emptiness: not as therapy, but as a vital anchor.
R	Resilience	Overprotection / low tolerance of	Difficulty is not an accident of the

		failure	design: it is a constitutive element. The teacher plans it; the student goes through it. Without real difficulty, condition A is a sham.
A	Agency	Immediacy / absence of real consequences	The final product of the cycle is a real action with authentic consequences. If A is simulated, the system does not close: there is no real evidence to feed back into M in the next cycle.

III. How MIRA articulates with your school's educational project

MIRA does not replace your school's educational project or compete with it. It operates at a different level: where the educational project defines the formative horizon —what kind of person the school wants to form, what values orient it, what exit profile it pursues—, MIRA defines how that horizon becomes concrete, observable and assessable in the classroom, condition by condition.

> *Without MIRA, a well-formulated educational project is a valuable but hardly verifiable declarative horizon in classroom practice. With MIRA, each feature of the exit profile has a corresponding condition, observable evidence and descriptors that allow the teaching team to know whether that horizon is actually being activated.*

School educational project	MIRA Teaching-Learning Model
Defines the formative horizon, the values and the profile of the person the school wants to form. It is the higher level: it gives meaning to everything else. Stable over time.	Defines how that horizon becomes concrete, observable and assessable in the classroom, condition by condition. Without it, the educational project is declarative. With it, each feature of the profile has verifiable evidence.

How each condition makes a formative horizon concrete

The following table shows how the four conditions of MIRA correspond to the formative dimensions that any serious educational project pursues, regardless of its character or pedagogical tradition:

Condición	Formative dimension	How it makes it pedagogically concrete
M	Self-knowledge / learning to learn	Metacognition turns the formative purpose into sustained learning: the student who knows how they learn can redirect their energy autonomously instead of depending on external stimulus.
I	Interiority / meaning / identity	Interiority is the pedagogical condition of any proposal that aspires to integral formation: without space to connect knowledge with one's own life, learning is superficial and does not transfer.
R	Perseverance / growth mindset	Resilience operationalises perseverance: it is not about enduring, but about managing error as information and adjusting strategy. It gives perseverance assessable descriptors differentiated by level.
A	Commitment / transformation / citizenship	Agency is the pedagogical proof of commitment: a value that does not materialise in observable action is not assessable. It requires authentic production with real consequences beyond the classroom.

A teacher who uses MIRA without knowing their school's educational project in depth applies a good pedagogical model. A teacher who knows that project and uses MIRA applies the model with an awareness of the formative purpose that underpins it. That difference is what turns practice into school culture.

IV. Empirical basis: why it works

MIRA is not a new proposal: it is an operational synthesis of what the most robust research identifies as the conditions of deep and lasting learning. It is built on three decades of research in the psychology of learning, cognitive science and neuroeducation.

> *The factor with the greatest impact on learning is not the teaching method but the student's capacity to self-assess. When the student can see their own learning from the teacher's perspective, the effect is transformative.*
> — John Hattie, Visible Learning (2009) · Meta-analysis of more than 1,800 studies

Condición	Reference research	Demonstrated effect	Implication for the model
M	Flavell (1979): metacognition. Zimmerman (2000): self-regulated learning. Hattie & Timperley (2007): feedback.	Metacognitive strategies: d = 0.69. Student self-assessment: d = 1.33. Planning and monitoring improve performance in a sustained way.	Systematic self-assessment is the highest-impact mechanism available. Condition M is not one-off: it is a cycle within the cycle.
I	Deci & Ryan (2000): Self-Determination Theory. Marton & Säljö (1976): deep learning. Immordino-Yang (2015): neuroeducation.	Intrinsic motivation predicts deep learning. Without emotional connection, learning does not transfer. Academic self-concept: d = 0.47.	Interiority is the condition of transfer. It is not an affective complement: it is an epistemic condition of deep learning.
R	Dweck (2006): growth mindset. Duckworth (2016): grit. Bjork (1994): desirable difficulty.	Feedback on the process: d = 0.73. The growth mindset improves performance in a sustained way. Desirable difficulty improves long-term retention.	Difficulty is not an accident of the design: it is its most valuable ingredient. Without R, M and A are shams.
A	Bandura (1997): self-efficacy and agency. Condliffe et al. (2017): Project-Based Learning. Celio et al. (2011): service-learning.	Student agency: a cross-cutting condition in all high-impact factors. Student expectations: d = 1.44, the top global factor.	Condition A closes the cycle. Without authentic production there is no real evidence of learning and no feedback possible.

Note: d = 0.20 small effect; d = 0.40 medium effect; d = 0.60 or above large and pedagogically significant effect.
Source: Visible Learning (Hattie, 2009; updated 2023), more than 1,800 meta-analyses.

The connection that Interiority seeks is not that of classic meaningful learning (Ausubel, 1968): it is not about anchoring the new in what is already known, but about extending that cognitive meaningfulness towards a personal meaningfulness —between the content and the student's experience, identity and purposes. The instrument does not measure their inner life, but the degree to which that connection becomes visible in what they produce.

MIRA in the context of other reference models

MIRA engages with the two most solid pedagogical frameworks in the international context and makes visible what neither of them resolves separately:

Pedagogical dimension	IB	H2020	MIRA	Nota
Explicit and assessable metacognition	◗	◗	✓	MIRA makes it operational with descriptors by level and by stage.
Resilience as an explicit assessable condition	◗	◗	✓	The only model with A-D descriptors of assessable resilience.
Applicable without external accreditation	—	✓	✓	The IB requires an authorisation process and sustained cost.
Compatible with the LOMLOE without adaptation	—	✓	✓	The LOMLOE competences map directly onto M·I·R·A.
Two formalised teacher-student tracks	—	—	✓	The feedback between directions is the mechanism of improvement.
Without spatial transformation of the school	◗	—	✓	H2020 requires redesigning spaces. MIRA operates in the existing classroom.
Shared descriptors ages 3–18	◗	✓	✓	A single vertical progression from Early Years to Year 4 of ESO.

V. When it is applied: the backward logic

MIRA is activated from assessment. Not because it is an assessment system, but because the design logic is always backward: first one defines what evidence demonstrates that the student has travelled the complete cycle and, from there, one designs backwards the sequence of tasks, the progression of difficulty and the monitoring instruments.

> *The backward effect is not a methodological option: it is the structural condition of the model. Without it, the four conditions can coexist on paper without generating the systemic cycle that characterises MIRA. Assessment does not come at the end: it guides the design from the start.*

The backward logic: from evidence to design

Moment	Backward question	What it defines	Instrument
1. Before the design	What evidence demonstrates that the student has completed the MIRA cycle?	The assessment criteria and the level descriptors for each condition.	Shared team rubric. A–D criteria.
2. In the design of the unit	What tasks, in what order and with what degree of difficulty, generate that evidence?	The sequence of activities, the level of scaffolding and the moments of self-assessment.	Unit planning. Experiential or inquiry project.
3. During the cycle	Does the emerging evidence confirm that the design is working, or is adjustment needed?	The real-time adjustments to the teacher's design, informed by the student's self-assessment.	Stage-based formative self-assessment: Learning Hands (Early Years), ★ sheet (Primary), checklist (ESO).
4. At the close of the cycle	Does the student's authentic product feed back into the design of the next cycle?	The patterns of strength and weakness by condition, which inform the team review.	Termly team review. Exhibition of learning.

Vertical progression of self-assessment

The model is applied across all stages with self-assessment instruments adapted to the student's maturity. The progression is intentional: the higher the stage, the greater the student's autonomy in appraising their own process.

Stage	Instrument	Design logic
Early Years education	Learning Hands (I watch and listen / I try it / I do it on my own)	The student signals their level of skill at the task with their hands. The assessment is the teacher's; the student begins to observe their own learning from action, without any connotation of result.
Years 1–4 of Primary	★ sheet with simple descriptors	The student appraises their performance in each condition with stars. The teacher contrasts and adjusts the grade if necessary.
Years 5–6 of Primary	Rubric with descriptors by level	The student self-assesses before submission using the rubric. The teacher starts from that self-assessment and

		applies the A–D criterion.
ESO	YES / PARTLY / NO checklist	The student completes the checklist and indicates where in their work the evidence for each item is located. The teacher contrasts and moderates using the A–D criterion.

Three assessment instruments

Instrument	What it mainly assesses	Features
Competence-based test	M (planning and adjustment) and R (error management under pressure)	Problem-situation with a real context. The student applies knowledge in a new situation, without a predefined solution.
Experiential project	I (personal connection) and A (emergent authentic production)	The student lives a designed experience and produces a reflection or product that connects that experience with their prior learning.
Inquiry project	The four conditions in a complete cycle	The student formulates a question of their own, designs the process to answer it and presents the results. It may include collaboration with an external audience.

Implementation conditions

The model is not implemented through one-off training. As a system, it requires three structural conditions:

	Structural condition
01	Team agreements on descriptors. Without shared criteria, the two directions do not speak the same language and the feedback loop does not close. One team session per stage is the minimum viable.
02	Self-assessment spaces integrated into the units. The student direction does not work if self-assessment is optional or only happens at the end of the term. It must be a constitutive part of the design of each unit.
03	Periodic review of the teacher's design. The team reviews, at least termly, whether the four conditions are present in their planning or whether any is systematically weak.

VI. Equity between well-being and demand

MIRA is demanding. It demands metacognition, tolerance of error, authentic production and real autonomy. The legitimate question any head teacher or teacher should ask before implementing it is: how is the student's well-being sustained within a model that asks all of this of them?

The answer is not to reduce the demand. It is to understand the difference between two types of demand that produce radically different effects:

Extractive demand	Generative demand
Demand without support. A challenge that exceeds available capacity without relational or cognitive resources. It produces exhaustion, disengagement and anxiety.	A challenge calibrated to each student's real capacity, with the resources needed to get through it. It produces real competence, pride in the process and sustained intrinsic motivation.

The variable that changes everything: demand with resource

> *Maximum well-being —the state of flow— does not appear when the task is easy or when it greatly exceeds the student's capacity: it appears exactly when the challenge is calibrated to the available level of competence. Too much challenge without sufficient competence produces anxiety. Too much competence without challenge produces boredom. Well-being and effort are not opposites: they are co-dependent when the pedagogical design is well done.*
>
> — Csikszentmihalyi · Flow theory

Deci and Ryan add the complementary piece: the three basic psychological needs —autonomy, competence and relatedness— are simultaneously the conditions of deep learning and the conditions of well-being. They are not optional additions to the pedagogical design: they are the mechanism by which sustained effort proves satisfying and not exhausting.

Psychological need (Deci & Ryan)	MIRA condition that activates it	How it is guaranteed in the school
Autonomy: feeling that one's own actions arise from oneself, not from external pressure.	Agency (A): the student makes real decisions about the process and the product. They do not execute what the teacher has decided: they act.	The teacher's individual monitoring ensures that the autonomy is real, not simulated. The student has a genuine margin of decision within the task.
Perceived competence: experiencing that one is capable of meeting the challenges of the environment.	Metacognition (M): the student who knows how they learn can attribute success to their strategy, not to chance. That generates real perceived competence.	Calibrated demand —a challenge matched to capacity— is the condition of flow and of real competence. The teacher adjusts the level of scaffolding according to the evidence.
Relatedness: feeling connected with others and with something meaningful.	Interiority (I): the connection with one's own life, with others and with something that transcends. It is the pedagogical antidote to emptiness and unwanted loneliness.	The tutorial action and the teaching team's monitoring build connection with the community. The meaning of learning is worked on explicitly in condition I.

> *The tension between inside and outside the school does not disappear. But it ceases to be a trap*

> *when the student experiences that what happens inside has something the outside cannot offer them: the satisfaction of having built something with real effort. That experience, repeated systematically, is more powerful than any immediate gratification, precisely because it is their own.*

VII. Assessment framework: the four operational documents

The operational development of MIRA is set out in a suite of four documents that constitute the reference framework for the model's criterion-referenced assessment. They are articulated hierarchically: Doc A establishes the conceptual framework and the shared assessment agreements; documents B, C and D make it concrete by stage and illustrate it with examples.

	Document	Content and function
Doc A	MIRA Assessment Framework	Reference document for the whole pilot network. It defines the common assessment criteria (A–D), the three instruments of the system —competence-based test, experiential project and inquiry project— and the minimum team agreements that guarantee the model's coherence across schools and stages. It is the document that gives meaning and grounding to the three documents derived from it.
Doc B	Stage guide — Primary education	A concretion of the Assessment Framework for the Primary stage. It adapts the A–D criteria and the assessment instruments to the characteristics of the cycle, and incorporates the vertical progression of self-assessment: ★ sheet for Years 1–4 and rubric with descriptors for Years 5–6.
Doc C	Stage guide — Compulsory Secondary Education	A concretion of the Assessment Framework for the ESO stage. It develops the A–D criteria with stage-specific descriptors and incorporates the YES / PARTLY / NO checklist as a self-assessment instrument: the student completes it before submission and indicates where in their work the evidence for each item is located.
Doc D	Bank of assessment-instrument examples	A repository of concrete examples of the three instruments of the system organised by stage and area. It allows the teaching team to see the criteria of Doc A applied in real classroom situations and to use them as a starting point for their own design.

VIII. Synthesis and references

Synthesis

The MIRA Teaching-Learning Model integrates five traditions that rarely converge in a single model:

1. Research on self-regulated learning (Zimmerman, Hattie, Flavell): what makes a student learn in a sustained way.
2. Motivational psychology (Deci & Ryan, Dweck, Bandura): what internal conditions determine whether a student wants to learn.
3. Evidence-based pedagogy (IB, Horizonte 2020): how to design an environment that activates those conditions.
4. Integral formation and meaning: interiority, perseverance and values as conditions of deep learning.
5. Spanish legal framework (LOMLOE): mandatory competence descriptors that the model makes visible and assessable.

All of this within the LOMLOE, without external accreditation, without radical spatial transformation, with shared descriptors from ages 3 to 18 and with a feedback loop that turns the model into a living system.

Source selection criteria

The references in this document are not a list of recommended readings. They are the sources on which MIRA's empirical claims rest. That imposes a specific requirement: it is not enough for a source to be relevant or influential — it has to meet objective criteria that make it fit to support pedagogical decisions in a real school.

Five criteria have guided the selection. They are not arbitrary: they are the standards that quality educational research uses to distinguish evidence from opinion, and robustness from anecdote.

#	Selection criterion	Why it matters	Sources that meet it in MIRA
1	**Peer review or meta-analysis**	MIRA's claims about the effect of each condition do not rest on an isolated study — they rest on the convergence of several independent systematic reviews. That makes them more robust and less dependent on publication bias.	*Hattie (2009, 1,800+ studies). Hattie & Timperley (2007). Celio et al. (2011, meta-analysis). Condliffe et al. (2017, lit. review).*
2	**Quantified and replicable effect**	The chosen sources express their impact in terms of effect size (Cohen's d) over large samples. That allows comparison and contextualisation. A source that only says ‘it works’ without quantifying does not allow pedagogical decisions to be made.	*Hattie (d=1.33 and d=1.44). Hattie & Timperley (d=0.73). Flavell/Zimmerman (d=0.69). Immordino-Yang (d=0.47).*
3	**Established academic recognition**	The sources have a proven scientific track record: published in peer-reviewed journals, cited thousands of times in subsequent literature, and resistant to the passage of time. They are not fashionable references.	*Flavell (1979, 47,000+ citations). Bandura (1997, 90,000+ citations). Deci & Ryan (2000). Dweck (2006). Marton & Säljö (1976).*
4	**Direct relevance to classroom design**	The sources not only document the phenomenon — they explain the mechanism that produces it and its practical implication for the teacher. That makes them guides for pedagogical design, not just research notices.	*Bjork (1994, desirable difficulty). Wiggins & McTighe (1998, backward design). Zimmerman (2000, self-regulation). Csikszentmihalyi (1990, flow).*
5	**Compatibility with**	The regulatory sources guarantee that	*Real Decreto 157/2022*

#	Selection criterion	Why it matters	Sources that meet it in MIRA
	the Spanish legal framework	MIRA does not operate in a legal vacuum but within the mandatory curricular framework. That allows the teacher to justify the use of the model to inspectors or families.	*(LOMLOE, BOE). EU Recommendation, May 2018. Horizonte 2020 (Jesuïtes Educació).*

A direct consequence of these criteria: sources that are popular, influential or widely cited in the educational debate do not appear in MIRA's bibliography if they do not meet the five criteria. The popularity of an idea on social media or at innovation conferences is not evidence of its effect on learning.

What unites all the selected sources is that their contribution is additive: each adds something the others do not cover. Hattie quantifies the impact of self-assessment; Bandura explains the mechanism of agency; Deci and Ryan provide the motivational framework; Dweck and Bjork account for the dynamics of error; Immordino-Yang grounds the emotional dimension. Together they form a convergent, not a redundant, basis.

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