THE CONDITIONS OF DEEP LEARNING

MIRA Notebooks

NOTEBOOK 5 · THE CLASSROOM'S DECISIONS

MIRA and Technology in the Classroom

Technology that builds agency, not immediacy

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MIRA model

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A tablet in the hands of a six-year-old is not, in itself, either good or bad. What is decisive is what the child does with it: whether they consume one video after another without pause, or record the interview their class did with the neighbourhood baker. The same tool feeds the problem or fights it. Everything depends on what it is used for — and on when.

The first factor in the diagnosis that underpins MIRA is digital immediacy: the habit, installed from an early age, of obtaining gratification with no waiting or effort. This poses a paradox an honest educational model cannot dodge: how to use technology in the classroom without feeding the very thing identified as harm?

MIRA's answer is a criterion, not a ban. Technology is neither rejected nor embraced by default: it is subordinated to its function. And its function, within the model, is twofold — to extend the reach of Agency and to scaffold Metacognition. Any digital integration that serves one of those two conditions adds; any integration that fosters passive, immediate consumption subtracts, however much it presents itself as innovation.

The aim: technology in the service of two conditions

Technology builds **Agency** when it is a tool for production, not consumption. A student who edits a podcast, designs a campaign, programs a simulation or publishes work for a real audience is using the digital to do something that matters and that leaves the classroom. There technology does not compete with learning: it amplifies it, because it multiplies the reach and quality of the authentic product.

Technology serves **Metacognition** when it becomes a mirror of one's own process. A document with its version history showing how a text evolved, a tool that records the steps of a solution, a digital portfolio where the student reviews their progress: in all these cases the digital makes thinking visible, which is the condition of possibility for reflecting on it.

> *The question MIRA asks of any digital tool is not 'is it modern?' or 'is it motivating?', but a far more demanding one: does it build agency or foster immediacy? Does it make the process visible or hide it behind an instant result?*

This distinction rules out, at the root, much of what is sold as educational technology. An app that rewards quick answers with instant rewards — the logic of instant gratification — is not neutral: it trains precisely the habit the model fights. By contrast, a tool that forces planning, revising and producing something of value is consistent with MIRA even if it is less flashy.

Modulation by stage: the developmental calendar rules

Digital integration follows the same principle as MIRA's four conditions: it is not applied with the same intensity or in the same form at all ages. What changes with development is the degree of autonomy with which the student uses the tool, ranging from full adult mediation to full self-regulation.

In **Early Years (0–6)**, technology is minimal and always mediated by the adult. There is no device in the child's hands as an autonomous tool. The digital, if it appears, is an occasional resource of the teacher — an image, a sound, a short video shared as a group — and never a substitute for physical manipulation, play and direct interaction, which are the stage's own routes to learning. Introducing individual screens here not only adds nothing: it contradicts development.

In **Primary (6–12)**, technology enters as a tool for simple production, tied to real projects. This is the age of the garden, the science podcast, the neighbourhood campaign — and the digital appears to give shape and reach to those products: recording, basic editing, guided information searching, presenting. The criterion is that the tool serves the project, not that the project exists in order to use the tool. Information searching is always accompanied, because this is also the age when children begin to be taught not to trust the first result.

In **ESO (12–16)**, technology becomes an instrument of research and creation. The student can now contrast digital sources, manage a project with collaborative tools, produce content of some complexity and publish for

a real audience. It is also the stage in which digital competence must include its critical side: identifying biases, recognising disinformation, understanding how the algorithms competing for their attention work. Here technology serves the Agency of social impact and a Metacognition that is beginning to be rigorous.

In **Bachillerato (16–18)**, technology is already an instrument of self-regulation and professional production. The student uses it to research rigorously, to manage long-range projects, to create products comparable to those of the real world — and to oversee their own learning with tools that record and organise their process. It is full digital integration, consistent with a student who governs themselves.

Coherence with the maturation process

There is an underlying reason, not a matter of convenience, for this progression. The capacity to use a digital tool without being used by it — without falling into the immediacy it is designed to provoke — depends on self-regulation, and self-regulation matures late. Asking a Primary child to manage a connected device autonomously is asking something their prefrontal cortex cannot yet sustain; it is, in practice, leaving them at the mercy of the addictive design of the apps.

That is why the introduction of technology goes hand in hand with the development of Metacognition and Resilience — the breathing of learning. As the student learns to regulate their frustration and to govern their attention, they can take on more digital autonomy without being dragged along by it. The sequence is not arbitrary: technological autonomy is granted at the pace at which the inner autonomy that allows it to be exercised well is built.

> *Granting digital autonomy before the self-regulation that sustains it exists is not bringing the future forward: it is exposing the student, defenceless, to what the model diagnoses as the first harm to this generation.*

In summary

MIRA is neither a technological nor an anti-technological model. It is a model that submits technology to the same criterion as everything else: does it help the student govern themselves, know themselves, persevere and act with meaning? Technology that builds agency and makes the process visible is welcome, and grows in autonomy as the student matures. Technology that fosters immediacy and passive consumption has no place, however innovative it may seem — because it would feed the very problem the model exists to fight.