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Grounded Tech Integration: An Effective Approach Based on Content, Pedagogy, and Teacher Planning

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ON PROBLEMS

OUR CHOICEST PLANS

HAVE FALLEN THROUGH,

OUR AIRIEST CASTLES

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BECAUSE OF LINES

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—PIET HEIN

Grounded Tech Integration

AN EFFECTIVE APPROACH BASED ON CONTENT, PEDAGOGY, AND TEACHER PLANNING

In many ways, Hein's aphoristic poem "On Problems" describes efforts during the past few decades to integrate technology into K–12 instruction—which, though successful in some contexts, has not produced the educational revolution that was predicted by technology advocates.

This is the first installment in a seven-part series, in which we present a different approach to curriculum-based technology integration that systematically erases and then re-draws the lines—those assumptions and practices that led to less-than-revolutionary tech integration.

The remaining articles of this series will appear in the Learning Connections section of *L&L*, beginning in this issue with a piece on social studies learning activity types (see page 26). Subsequent installments that focus on mathematics, K–6 literacy, science, world languages, and English/language arts describe learning activity-types taxonomies, along with classroom-based examples illustrating their use.

Tech Integration Redux

Technology integration efforts often begin with what's most unfamiliar to many teachers: the technologies themselves. Though it's true that we must first become familiar, comfort-able, and competent with technologies to be able to integrate them into instruction effectively, doing this alone does not ensure effective technologi-cally facilitated teaching. Most technology integration strategies begin with and focus on the technologies' affordances and constraints—what they can help us do and their limitations. Unfortunately, this approach does not ensure that educational technologies will be well integrated into instruction that is keyed to specific content-based learning goals.

What is needed instead is an approach to technology integration that:

- Focuses on students' standards-based learning needs rather than the specific features of particular tech tools and resources
- Is easily adaptable to multiple teaching styles and levels of technological proficiency
- Can be learned and applied relatively quickly, with few, if any, additional resources required, even in resource-scarce settings
- Is predicated upon teacher ownership of the planning and implementation process to ensure long-term use

How can we meet these requirements? By selecting educational technologies last, as the final step in instructional planning.

How can we ensure effective tech integration if technological decisions are such low-priority tasks? By constraining tech options according to the types of learning activities included in an instructional plan.

We think of this as a "grounded" approach to technology integration because it is based in content, pedagogy, and how teachers plan instruction. In the sections that follow, we'll describe how technology integration decisions may be better incorporated into the ways teachers typically plan for teaching and learning.

Tech-Integrated Planning

Research tells us that teachers plan instruction primarily according to curriculum standards-based learning needs. Lesson, project, and unit plans are organized and structured with content-based learning activities. We based the "activity-types" approach to helping teachers better integrate technology into curriculum-based instruction on the results of this research. Quite simply, we suggest matching technology integration strategies directly to how teachers match—by specifying learning activities—rather than asking teachers to plan instruction to the opportunities offered by educational technologies.

Planning instruction that is facilitated by the use of digital tools and resources can be complex, with each decision affecting other decisions. Yet there are five basic steps to planning a learning event, regardless of the planning model used.

1 Choose learning goals.
Planning must begin with appropriately selected learning goals for students. In most schools, these learning goals are framed by district, state, and/or national content-based curriculum standards.

2 Make pedagogical decisions.
Once you determine learning goals, consider a series of eight practical pedagogical decisions that will determine the specific parameters of the learning experience you are planning. Based on knowledge of learning needs and preferences, plus the logistical realities of classrooms, teachers should determine:

HOW CAN WE ENSURE EFFECTIVE TECH INTEGRATION IF TECHNOLOGICAL DECISIONS ARE SUCH LOW-PRIORITY TASKS? BY CONSTRAINING TECH OPTIONS ACCORDING TO THE TYPES OF LEARNING ACTIVITIES INCLUDED IN AN INSTRUCTIONAL PLAN.

Eight Corresponding Continua

More Teacher Centered ←——————————————→ More Student Centered

Type of Learning (e.g., convergent) ←——————————————→ Alternate Type of Learning (e.g., divergent)

Fewer Prior Experiences ←——————————————→ More Prior Experiences

Surface Comprehension ←——————————————→ Deep Knowledge

Shorter Duration Plan ←——————————————→ Longer Duration Plan

More Structured Learning ←——————————————→ Less Structured Learning

Whole Group   Small Group   Individualized
←——————————————————————————————————→

No Additional Resources Required ←——————————————→ Multiple Additional Resources Required

WE SUGGEST MATCHING TECHNOLOGY INTEGRATION STRATEGIES DIRECTLY TO HOW TEACHERS PLAN—BY SPECIFYING LEARNING ACTIVITIES—RATHER THAN ASKING TEACHERS TO PLAN INSTRUCTION THAT IS MATCHED TO THE OPPORTUNITIES OFFERED BY EDUCATIONAL TECHNOLOGIES.

- The primary focus of the interactions in this learning experience: Will it be more teacher centered or more student centered?
- The type(s) of learning described in the curriculum standard(s) the learning experience will address: For example, should students develop similar understandings (via convergent learning) or draw their own conclusions (via divergent learning)? Should the learning be more hands-on or more abstract?
- Students' prior knowledge and skills relative to the type of standards-based learning that will occur in the learning experience: Do they have fewer or more relevant prior experiences?
- The depth of understanding sought from this particular learning experience relative to the curriculum standards to be addressed: Is more introductory/surface comprehension sought, or should deeper knowledge be constructed?

- The amount of time, both in class and at home, required for learning relative to the depth of understanding sought from this learning experience: Will a shorter duration or a longer duration plan for learning be more appropriate?
- The amount and type of structure for the learning experience, determined by the standards to be addressed, students' prior knowledge and skills, the depth of understanding sought, and the amount of time required, plus students' specific and general strengths and challenges relative to the planned activity: Is more- or less-structured learning more appropriate?
- The learner configuration(s) that will best assist learning in the context in which the experience will occur: Would whole-group, small-group, individualized, or mixed-type configurations work best for this particular learning experience?

- Any additional resources required for a learning experience with this particular design: Are fewer, more, or no additional resources required for students to participate in the learning experience? (This decision may be directly related to the technologies selected in step 5.)

Each of these eight parameters can be identified by marking an interval on one of the eight corresponding continua pictured on the left. Each interval's width can vary, representing broader or narrower ranges addressed for each parameter in the developing instructional plan.

3 Select activity types to combine. Once teachers select the standards-based learning goals and delineate the eight pedagogical parameters for a lesson, project, or unit, they can then determine the nature of the specific activities that will comprise the learning experience. Each content area's learning activity types are different because the nature of inquiry and instruction differ among disciplines. Selecting the most appropriate types of educational activities to combine is easier if teachers consider the complete range of activity types. This is the idea that undergirds the comprehensive learning activity types taxonomies described in this series of articles and shared via the Learning Activity Types Wiki we established. The wiki is for anyone interested in learning to "operationalize TPACK" (technology, pedagogy, and content knowledge) via curriculum-based learning activity types, getting up-to-date information on the taxonomies, and participating in their vetting and refining in each of the curriculum areas in which development is happening.

The breadth of a plan for technology-integrated learning is reflected in the number of activity types it encompasses. Though activity types can

be used alone, they rarely are. Generally, the more activity types that are included in an instructional plan, the deeper and more differentiated the learning that results.

4 Select assessment strategies. After determining the activity types to combine, select appropriate assessment strategies to gauge student progress in achieving the targeted learning goals. Assessments can serve many purposes, including providing the teacher with feedback on student progress, enabling students to synthesize information at multiple points in a unit of study, and appraising students' mastery of learning goals at the end of a unit.

It is important to include assessment both during learning activities (formatively) and after they are complete (summatively). Many activity types can serve as assessments. For example, answering questions, participating in a group discussion, and creating a timeline can all serve as formative gauges of student progress in social studies. Similarly, taking a test, writing an essay, and creating a presentation are examples of summative assessment options.

5 Select tools/resources. Unfortunately, many teachers wishing to incorporate educational technologies into curriculum-based learning and teaching begin by selecting the digital tools and resources they will use. When instruction is planned in this way, it becomes what Seymour Papert, a seminal thinker regarding computers and pedagogy for children, calls "technocentric"—instruction focused more on the technologies being used than on the students who are trying to use them to learn. Technocentric learning experiences rarely help students meet curriculum-based content standards, because the design of the learning experience has focused more on use of the selected technologies than what is most appropriate for a particular group of students to learn.

Alternatively, if teachers choose learning goals in accordance with students' learning needs, if they make pedagogical decisions according to instructional and contextual realities, and if they select learning activity types (including assessment strategies) to match those goals and realities, then the instructional plan is likely to succeed. Choosing only from the educational technologies recommended for each of the selected learning activity types supports teachers' technology integration efforts without shifting their focus away from students' curriculum-based learning needs and preferences.

Learners First, Technologies Last

Though we have presented an approach to instructional planning as a linear sequence of steps, in practice, the process is recursive. As students' learning needs and experiences develop, as contextual conditions (for example, technology access) change, as teachers' expertise grows, and as curriculum requirements shift, the decisions and choices made at each of the five stages of planning will similarly change. Each new development may necessitate modifications.

These five generic steps don't comprise an instructional planning model per se. They can be incorporated easily into planning with many popular models (for example, Madeline Hunter's Seven-Step Lesson Plan, Backwards Design, and Teaching for Understanding).

The activity types approach to technologically integrated instructional planning is focused squarely on students' standards-based, curriculum-related learning outcomes rather than on the technologies that can assist in creating those outcomes. The process is designed to help teachers plan effective, efficient, and engaging learning experiences for their students.

In the curriculum-focused articles to come, we will describe six learning activity-types taxonomies, along with classroom-based examples illustrating their use, drawn from as broad and inclusive a range of curriculum standards, pedagogical approaches, and digital and nondigital technologies as possible. We will try not to favor a particular view of teaching and learning or propose a preferred way of integrating technology. In doing so, we are advocating for teachers to retain—or in some school districts, regain—their decision-making power in instructional planning and practice.

Resources

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