2-2010

Grounded Tech Integration: English Language Arts

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Recommended Citation

Young, C., Hofer, M., & Harris, J. (2010). Grounded tech integration: English language arts. Learning & Leading with Technology, 37(5), 28-30.

the unit by programming simple and separate procedures with change-agent attributes such as color, size, and location. Students can press keys individually or simultaneously, producing many humorous combinations of change, such as animals changing size and color simultaneously.

They control motion by manipulating the distance that their creations cover in one time step. Students quickly recognize that the default value of "one step" represents the distance covered in a single iteration. By turning this constant into a variable, students experiment with velocity by creating a slider that changes that variable in real time and moves their creations at different speeds. By combining that movement in the *x* direction with a separate change in the *y* direction, they can experiment with independent simultaneous change of velocity in two dimensions.

The progression from simple manipulation to the advanced programming concept of variables moving both vertically and horizontally occurs naturally, as they are linked to the student's desire to create a variety of motions for their creations.

The culmination of the kinematics section is a unit on projectile motion. To get realistic vertical motion, students add to independent motions on the ground a procedure for the negatively directed acceleration of free fall in the *z* direction. A game can help students experience this hard-to-picture situation (see Figure 3). Students build a jumping game by following a set of scaffolded instructions. The goal of the game is to get a raccoon to jump over a wall and hit a target. Students build procedures that produce forward motion at a constant velocity and vertical movement that employs acceleration. Although these are separate procedures, they can be executed simultaneously to demonstrate realistic motion.

After completing this unit, a student wrote this reflection:

> I really like this style of learning because it is not taking tedious notes. You get to demonstrate the concepts you are learning through simulations rather than just writing and reading.

StarLogo TNG can feasibly fit into a crowded science curriculum along a spectrum from students manipulating a prebuilt simulation model, to modifying a model, to designing and building their own models. TNG can leverage students' enthusiasm for playing and making games. As TNG continues to develop, look for an integrated means to share projects with an online community of StarLogo TNG users as well as other features that integrate the sciences of simulation and gaming. Find out more at http://imaginationtoolbox.org.

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Grounded Tech Inte

This is the fourth article in a series on grounded technology integration. See Resources for the full list of previous articles.

The English language arts (ELA)—traditionally conceptualized as reading, writing, speaking, and listening—are evolving due to emerging technologies and the newer literacies they inspire. Students enter the ELA classroom already literate in multiple ways: reading, writing, and producing multimodal and multimedia texts for specific audiences and contexts. Emerging technologies provide new modes and media for communication but also create new opportunities and challenges for teachers. How can technology integration efforts focus on the ELA curriculum–based learning needs of students while leveraging the benefits of particular tools and resources?

One way to help teachers integrate technology effectively is to focus on instructional planning. Research indicates that teachers plan instruction primarily according to curriculum content–based learning needs. Plans for lessons, projects, and units are organized and structured with content-based learning activities. Our approach to helping teachers better integrate educational technologies into

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Reading Process Activity Types

Twenty-three of the ELA activity types focus on the reading process, including two prereading, fourteen reading, and seven postreading activity types.

Sample Activity Type	Brief Description	Possible Technologies
Using Prior Knowledge	Students use prior knowledge and experience to help discern meaning and forge connections with reading.	Wikis, personal response systems
Making Predictions	As a means of drawing on existing knowledge and generating new connections with texts, students make predictions about texts.	Digital cameras, blogs

Writing Process Activity Types

Eighteen of the ELA activity types focus on the writing process. These include three prewriting, four organization, eight writing, and three postwriting activity types.

Sample Activity Type	Brief Description	Possible Technologies
Publishing	Students publish finished pieces to share processed writing with larger audiences.	Online publishing sites, participatory media
Performing/Performance	Students perform or possibly record their finished writing to share it with a specific audience.	Videoconferencing/streaming video, digital audio/video recording

Language Use Activity Types

Seventeen of the ELA activity types address language use. Three address language exploration, inquiry, and awareness; two help students with language practice; four assist with language analysis; five help with language conventions; and three help with developing vocabulary awareness, use, and analysis skills.

Sample Activity Type	Brief Description	Possible Technologies
Vocabulary Awareness	Students acquire new vocabulary and develop awareness of various features of sets of words.	Concept mapping software, online dictionaries, Magnetic Poetry website, online vocabulary games
Vocabulary Analysis	Students analyze new and existing vocabulary to develop both awareness of core features and more sophisticated understandings.	Concept mapping software, online dictionaries, online vocabulary games

Oral Speaking/Performance Activity Types

Three of the ELA activity types address oral speaking and performance. Performance can serve as a natural extension of oral language instruction and activities.

Sample Activity Type	Brief Description	Possible Technologies
Speaking/Speech	Students produce oral language in a variety of contexts.	Digital audio/video recording, podcasts, and other participatory media
Evaluating/Critiquing Speech/Performance/ Production	Students build evaluation skills as they assess and critique speeches and performances.	Online rubric generators, digital audio/video recorders and players

Listening/Watching Activity Types

Three of the ELA learning types focus on listening/watching. A key component is the active nature of taking in information and stimuli, then processing it to respond.

Sample Activity Type	Brief Description	Example Technologies
Watching/Viewing Actively	Students watch/view actively and process visual images (still or moving, silent, or audio enhanced) learning from, responding to, acting on, applying information from, and/or creating memories in response to them.	Online image/video sites, digital video recordings, online demonstrations/ simulations
Multimodal/Multimedia Interaction	Students listen, watch/view, and interact with or participate in multimodal and multimedia texts.	Participatory media, digital audio/video devices for recording and playing files

curriculum-based instruction is based on the results of this research. We suggest matching technology integration strategies to planning methods, rather than asking teachers to plan instruction that exploits the opportunities offered by particular educational technologies.

One way to assist with technology integration during planning is to draw from a comprehensive set of learning activity types for each curriculum area, with particular educational technologies specified that can best support the learning goals within each activity. We have organized the ELA learning activity types into subcategories to form an informal taxonomy. Once teachers have determined the learning goals for a particular lesson, project, or unit, they review the activity types for that content area, selecting and combining the activities that will best help students achieve the learning goals. Teachers then choose from the educational technologies listed for each learning activity type to support the instructional plan. We consider this grounded technology integration because it is based in content, pedagogy, and instructional planning.

Activity Types for Secondary ELA

To date, we've identified 65 learning activity types for secondary ELA teaching and learning that address the five primary ELA processes: reading, writing, language use, oral speaking/performance, and listening/watching. Though space restrictions don't permit us to share the entire list of activity types here, the complete ELA taxonomy is available on the Activity Types Wiki at http://activitytypes.wmwikis.net. In the tables of sample activity types on page 29, we've provided brief descriptions, along with illustrative lists of technologies that may be used to support each.

Combining ELA Activity Types

Ideally, ELA teaching integrates the processes discussed here: reading, writing, language use, speaking/performing, and active listening/watching.

Consider, for example, the activity types combined to study *The Scarlet Letter.* One compelling bridge for high school students reading Nathaniel Hawthorne's classic novel is to explore their own feelings of guilt or shame that are made concrete by having to display their own "scarlet letters." In a prereading activity, students are asked to think deeply about guilt and what it means. These initial thoughts are kept private to build anticipation and personal connection. For homework, students find or create their own symbols representing an episode of personal guilt or shame to wear to school the next day without divulging to others what the symbols represent. Once students return to class, they discuss their symbols and related incidents. More important, they discuss the experience of wearing their objects throughout the day. Students could also record their initial ideas about guilt and shame, as well as their experiences wearing a symbol of one of those themes, in blogs. Using video cameras to record their experiences could add a multimodal element to these reflections.

As a reading activity, teachers could partner with a class at another school to share these initial blog postings and digital videos. This could foster discussion, creating dynamic reference points for exploring the theme of guilt as students read the novel. They could discuss these ideas using iChat, Skype, or online discussion boards. They could also conduct mini-inquiries on the nature of guilt in contemporary society, especially given current ethical issues in banking and lending, as well as illicit drug use in professional sports.

As a postreading activity, students could work in small groups to create a digital video that defines and represents the theme of guilt, not only with reference to the novel, but also by exploration of their own guilt-related episodes, their in-class and online discussions, and the collaborative thematic inquiry in which they engaged.

Invitation for Collaboration

Given continual changes in ELA curricula and instructional resources as well as the ongoing evolution of new literacies, the range of ELA learning activity types and the emerging technologies that can support each will continue to develop over time. We invite you to help us to expand, refine, and revise the secondary ELA learning activity types taxonomy. To contribute, please visit the ELA section of the Activity Types Wiki and share your ideas via the online survey posted there.

Resources

"Grounded Tech Integration," *L&L*, September/October, 2009, pp. 22–25
"Grounded Tech Integration: Languages," *L&L*, December/January 2009, pp. 26–28
"Grounded Tech Integration: Math," *L&L*, November, 2009, pp. 24–26
Learning Activity Types Wiki: http://activitytypes.wmwikis.net/World+Languages
"Tech Integration in Social Studies," *L&L*, September/October, 2009, pp. 26–28

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