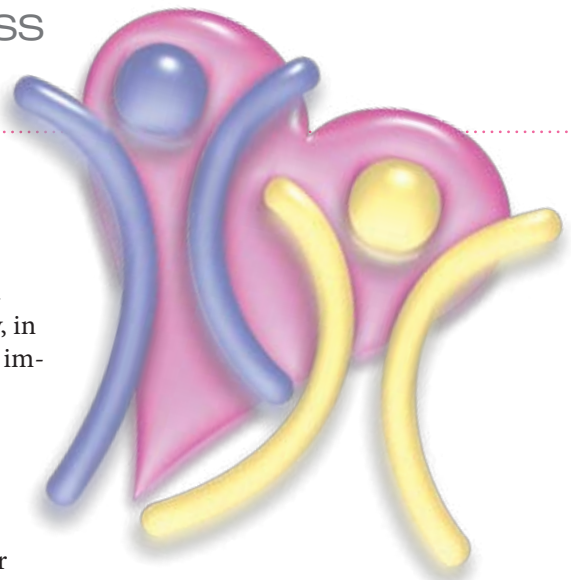


## Exergaming: Cardiovascular Fitness In Immersive Virtual Environments

By Daniel Nadler



There is a revolution in the works at the West Virginia Department of Education—a Dance Dance Revolution. The popular Konami game that grew up in the arcades of Tokyo was placed in every single one of West Virginia’s 765 public schools roughly three years ago, and made a mandatory part of the statewide PE curriculum. The game displays dance steps to popular songs on an overhead screen, and requires participants to match those steps by chasing lighted squares on an electronic pad. Within a year of their implementation, increased levels of physical fitness among students were reported throughout a state that normally reports the third highest rate of obesity in the nation.

Across the United States, a veritably new health phenomenon is taking hold: Exergaming. From stationary bikes with built-in screens and video games that simulate car racing (the faster you pedal, the faster your Ferrari goes) to Dance Dance Revolution sessions, exergames are spreading to public school physical education classes and private youth-targeted gyms, at a rate unseen since the introduction of the hula hoop. Advocates of exergaming present it as a counter-revolution against the stationary and sedentary impulses of a generation (aged 6–19 in 2007) that spends as much time in front of televisions and computer screens as in class, and which counts as much as 30% of its membership as medically obese. Exergaming, some

believe, is the vanguard of a broad social change integrating man and machine, reality and virtual reality, in the service of serious ends such as improving youth health and fitness.

Other schools are paying attention. Woodside High School in California is one of many West Coast schools that are piloting exergaming programs as part of their PE curriculum. In addition to Dance Dance Revolution, Woodside High School installed stationary bikes with integrated computer screens, which allow students to race sports cars and all-terrain vehicles against one another simply by peddling an exergaming bike as hard as they can. When interviewed for the *San Francisco Chronicle*, the chair of the physical education department at Woodside reported that students “love Dance Dance Revolution and the game bikes. This is the first time in 11 years of teaching PE that I’ve had to kick kids out of class who don’t want to stop exercising.” At Cesar Chavez Elementary, another California pilot school that received Dance Dance Revolution as a donation, the PE teacher reports that the exergaming equipment is “excellent for their coordination, and it’s an incredible cardio workout...It’s gotten to the point that if it’s sunny out they get disappointed.” Of course, such statements reveal a serious drawback to the exergaming movement—the possibility that in making children fit indoors, they could become even

more dislocated from their natural environment, and completely eschew more traditional outdoor sports such as soccer and track and field.

Exergaming advocates respond that the movement is made to supplement—not replace—traditional physical activity in times (i.e., winter) or in places (i.e., schools hemmed-in by dangerous urban environments in which there are few safe places to exercise and play outdoors) that are not conducive to physical activity.

Reassuringly, some of the most affected are the most engaged, and many exergaming gyms are targeted especially at severely overweight children. According to one such child, who after being unable to lose weight at traditional gyms because of boredom and repetitiveness joined the Overweight Fitness Teen Gym because of the video-game-enabled exergames that would allow him to begin a healthy lifestyle by having fun, “It’s entertaining... They make you feel like you are not working out. But you are.” This child’s road to recovery and

healthy living is paved by Mo Boxing, an exergame that develops cardiovascular health and muscle tone by projecting computer animated boxing opponents on a screen, who jab, duck, and swing in response to the motion-captured movements of the user. Mo Boxing is characteristic of the new emerging class of exergames: Video screen games are replacing traditional user interfaces such as joysticks with input devices activated by strenuous physical movement or exertion, such as the electronically sensitive Dance Dance Revolution pads, electronically-enabled stationary bikes, and camera or infrared-captured motion-movement markers placed directly on the body, which allow the wearer to become a virtual boxer, ninja, skateboarder, martial artist, baseball player, and golfer.

Second-generation exergaming technology features handheld, Nintendo Wii-style interface devices that can turn suburban gym students into professional boxers, golfers, and tennis players. Some versions of these second-generation products, which are being designed by Nintendo, Sony, and other media conglomerates, feature real-time calorie counters and heart-rate monitors that could allow teachers to quantify student effort, and compare the effectiveness of the intervention against other more quotidian exercises such as running or swimming.

Future generations of exergaming technology hold out the possibility of integrating wireless headset sensor-based electroencephalography (EEG) technology. Both the Xbox and PlayStation franchises are looking to bring the cost of these sets down to \$20 a unit within the next few years with screen-projected, multi-player visual worlds. With these major corporate clients in mind, companies like

Emotiv and NeuroSky are designing and building EEG headset computer interface devices that sense and translate human brainwaves (measured by reading skin surface manifestations of brain electrical activity) into machine readable code allowing users to move and manipulate avatars in virtual worlds just by thinking about the basic physical movements they want translated.

Industry heavyweights such as Sony are betting enormous sums of money on the synthesis of physical fitness and role-playing software. Two years ago, Sony came out with EyeToy, which could integrate the motion-captured movements of the user into the virtual environments of exergaming simulations. Mastering martial arts moves and reciting them in the safety of a living room or gym turns the user into a crime-fighting explorer of the most dangerous back alleys that fiction and 3D graphic engines can contrive, while a simple change of heart and thrust of the knee can transform that same user into an international soccer star in the midst of a historical World Cup match.

In less than a half decade, well-stocked gym classes could feature rows of TV screen-equipped treadmills on which students race against one another in a massive multiplayer world, running faster to speed up the avatar, and thinking thoughts that the EEG headset can translate into jumping or direction-changing movements. It might seem that the implementation of this expensive prospect will be the preserve of private schools and high-end fitness clubs, but the savings in health care costs could well pay for the installation of exergaming machines in American public schools.

It is hardly surprising that U.S. presidents have long identified the growing prevalence of sloth and inertness

of the American public as a threat to the nation itself: As many empires that collapsed at the height of their decadence discovered, a nation is only as strong as its citizens are healthy, vigorous, and well educated. Exergaming might just be a development of national importance.

### Resources

Dance Dance Revolution: <http://www.ddrgame.com>

Gaming goes for the burn, *PRweek* (U.S. ed), Feb 19, 2007. 10(7) pg. 13

Schools use video gadgets in obesity fight, *The San Francisco Chronicle*, Tuesday, February 20, 2007, Section A-1

Wii: <http://www.wii.com>

—Daniel Nadler is a research fellow at the Program on Education Policy and Governance at Harvard University.

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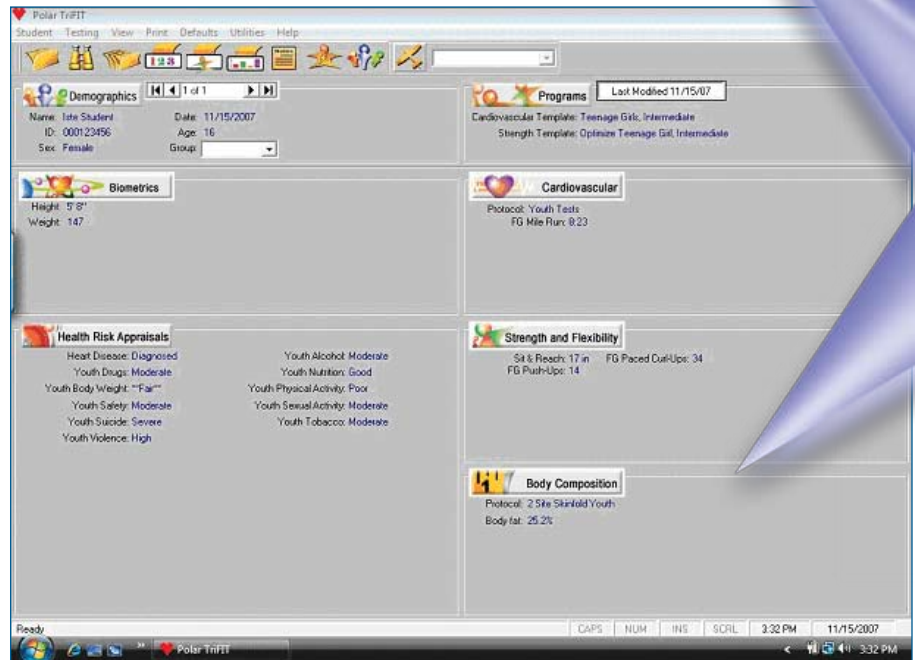


## Using TriFIT to Assess Fitness and Health

How important is fitness in today's K-12 curriculum? Consider that two out of every three adults in the United States are overweight or obese, Type II diabetes has tripled in the 30 past years, and two of every three deaths and one of every three hospitalizations are linked to preventable lifestyle behaviors. In addition, the Centers for Disease Control and Prevention have declared obesity a national epidemic. According to the National Center for Health Statistics, 15% (\$1.7 trillion) of the U.S. gross domestic product will be spent this year on illnesses related to obesity, such as heart disease, stroke, diabetes, cancer, and chronic obstructive pulmonary disorders. This figure is predicted to grow to 18% by the year 2012 as the U.S. population continues to age and obesity rates continue to climb.

Standardized testing in public schools has led to a decline in the time devoted to health and physical education. As a result, the need to conduct fitness testing in an efficient and timely fashion has never been more important. Fitness testing results may be used to identify baseline measures, to develop personalized conditioning programs, and to provide students with an understanding of the relationship between behavior and health and fitness.

TriFIT 4.9 (<http://www.polarusa.com>) is fitness assessment and health risk appraisal software designed for use by a number of health and physical educators across multiple classes. The software includes various fitness tests to measure muscular strength, muscular endurance, flexibility, cardiovascular endurance, and body composition. Additionally, resting heart rate,



Personal View mode with health risk appraisal and fitness tests completed.

blood pressure, body mass index, girth measurements, blood chemistries, and pulmonary function measures may be assessed to help develop a comprehensive health and fitness profile. Tests may be selected to correspond with a specific age group, and TriFIT 4.9 includes all components of the Fitness-Gram and the President's Physical Fitness Test protocols.

The health risk appraisal component of TriFIT 4.9 provides a series of questions to identify health risks associated with student behaviors. Specific tests are included for the areas of alcohol, drugs, nutrition, body weight, physical activity, safety, sexual activity, suicide, tobacco, and violence. As is true for the fitness component, specific tests are included for use with student and adult populations. TriFIT 4.9 includes an encyclopedia that explains each fitness and health component and identifies the risk factors and provides suggestions for improvement.

This feature is very useful for students who may miss a class or assessment.

Once the fitness assessment and health risk appraisals have been completed, TriFIT 4.9 allows for the development of a personalized fitness program that addresses muscular strength and endurance and cardiovascular endurance. The student may select a program based on gender, current fitness level, or for a specific sport or activity. This feature is quite useful when incorporated in a health unit or physical education course where the goal is enhanced fitness.

Finally, after all tests have been completed, a variety of reports may be generated to satisfy and inform the student, administrators, parents, and others. The most basic report is the summary that includes raw numbers for each test or assessment the student has performed. The next available report is the graphical summary, which not only provides test results but also compares

By Ken Felker

the results to norms in a bar graph format. The most extensive of the reports is the personal profile. This report identifies and describes the test or assessment the student has completed, compares the results to national norms, and makes recommendations for improvement. The personal profile may include as many as 20 pages and may be saved as a PDF file and automatically sent to the student as an e-mail attachment. In addition to these individual reports, teachers may generate a group report to provide the teacher with class norms for each of the fitness tests and specific items included in the health risk appraisals. The reporting of group results is always of great interest to the students.

The TriFIT 4.9 software offers busy health and physi-

cal educators a number of easy-to-use, time-saving features and options. Student rosters may be imported from a spreadsheet or text file to aid in the initial setup. Teachers have the option of switching between the personal view and the quick entry view to enter data for a single student or an entire class. Notes may be attached to student records, providing easy access to this information in the gymnasium, fitness center, pool, and track. This feature will increase student safety and reduce the likelihood of liability issues.

Even though TriFIT 4.9 works as stand-alone software, it may also be used with the TriFIT 700. This is a hardware system that provides direct data entry for body weight, skinfold measurements, bicep curls, and the sit-and-reach. Once the tests are completed the results are immediately sent

to the student record. Additionally, TriFIT 4.9 works with Pocket TriFIT on the Pocket PC handheld platform. Pocket TriFIT allows for the downloading of class rosters to the handheld, then fitness tests are selected and test results are recorded. This information may then be synced to TriFIT 4.9 for report development.

If teachers are looking to make better use of health and fitness testing results in less time, TriFIT 4.9 offers options, flexibility, and various report formats. The two most frequent comments heard from parents when they see the personal profile of their son or daughter are, "We didn't do anything like this when I was in gym!" and "When can I get tested?"

—Ken Felker is a professor of health and physical education at Edinboro University in Edinboro, Pennsylvania, and L&L's curriculum specialist for physical education and health.

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## Going the Distance: E-mail from Norway



While living in Norway, I thought using e-mail would be a great way to bring some curious Norwegian junior high school students into direct contact with their U.S. counterparts and provide them with authentic opportunities to use the English they have studied since second grade. For both U.S. and Norwegian students, this activity generated high interest in writing to *real* people their own age; capitalized on their interest in other teenagers' lives while practicing their language skills, and helped them to form international friendships, foster international understanding, and hone their technology skills.

The project involved two ninth grade and one eighth grade classroom in Oslo and a ninth grade class from Menomonee Falls, and an eighth grade class from Milwaukee, both in Wisconsin. Because this activity happened around Halloween, the ninth grade classes read Patricia C. McKissack's "Justice," a short story from *The Dark Thirty: Southern Tales of the Supernatural*. Besides being a suspenseful choice for Halloween, it is an engaging topic for an American studies discussion in that it explores racism and Ku Klux Klan activities in the 1930s. Additionally, we read Katharyn Howd Machan's poem "Hazel Tells LaVerne," a dramatic monologue that examines the Amer-

ican dream. The poem complements the Klan story as it explores civil rights inequities long perceived to be rectified but that may still be experienced by some Americans—or Norwegians for that matter. Although the poem is written in informal, spoken English, when read aloud, it is easily understood by second language learners.

The teachers organized the e-mail exchanges over a number of days with initial e-mails and responses sent by agreed-upon dates. Students were assigned at least two people with whom to correspond to ensure varied responses, increased exposure to different writers, and full credit for participation despite absenteeism or noncompliance.

To prepare the students for the e-mail exchange, I gave the teachers guidelines for student introductions and for a reader-response text discussion, modeled on methods I used in Norwegian classrooms to generate

conversation and elicit questions. During my lessons, Norwegian students shared with me both their funny and scary impressions of the U.S. based on its popular culture and stories about civil rights violations that had occurred in Norway.

We decided that because the Wisconsin students were writing in a first language, they would initiate the e-mail correspondence. Beth (the ninth grade teacher in the U.S.) wrote that her students "were surprised how politically up to date the Norwegian students were" and "they were impressed [with] how well the Norwegian students wrote in English; this would be a difficult task for them if the roles were reversed."

The eighth graders e-mailed each other in the spring, after almost a year of English at the lower secondary level for the Norwegian students. They waited as long as they did because,

### Guidelines for E-mailing

#### Introductions:

1. Name
2. Family information (being Norwegian-American, etc.)
3. Location in Norway and/or U.S. and how long the family has lived there. Description of life.
4. Interests: sports, politics, movies, films, music, fashion.
5. What kids do after school in each country.
6. Description of school(s)—urban, rural, suburban; rich, poor.
7. Impressions of the other students' country.

#### Response questions:

1. What was your (my) first impression of the story (poem)?
2. Are these characters and/or situations still happening in your (my) country?
3. Do you know of a real life occurrence that mirrors any in the story or poem?
4. What other stories or poems seem similar to the ones read? Tell them to each other.
5. How did the text make you (me) feel about how I live in my country?
6. Is the Klan still active in the United States? Are there similar groups in Norway? How do you know? Share the story with each other.
7. Did anything confuse you about the text? What does it mean ...?
8. Do people really attain the American Dream? Is there a Norwegian Dream and are people moving there to get it? Tell me a story about that.
9. What do you think makes us different? The same?
10. This text made me think of ...

By Donna L. Pasternak

despite most Norwegian students taking English as a second language since second grade, it is not until eighth grade that many of them have English three days a week. Students too shy and uncertain to speak in October were magpies in April. Waiting added to the success of the activity.

The eighth graders read the “Names and Surnames” chapter from Alma Flor Ada’s novel *My Name is Maria Isabel*. I chose this chapter because, in my experience, students were more confident in their second language skills when describing and talking about themselves. Additionally, this chapter allows for discussion of family history around one’s name, leading to how names also identify ethnicity and social class. We changed the questions in the guidelines to address the new topic, now asking students to share personal information and stories

about their names and heritages.

Eirik (the eighth grade teacher in Norway) felt that “even the e-mails that moved to correspondence focused on personal hellos and I like this and that ... [they were] still good value for language and communication practice.” Some of the students continued their messaging outside the classroom, surprising Brad (the eighth grade teacher in the States).

### Communicating Across Distances

When I first approached students in Oslo with the prospect of e-mailing U.S. students their age, they did not shy away from the challenge. Many of them were proud to learn they would study—could study—the same reading material as their American peers. Eirik wrote, “Firsthand information and direct contact is a great way to know culture and people.” In agreement, Brad elabo-

rated, “It was also interesting to look at the variations in language usage and to generate discussion about what wasn’t understood. Furthermore, the students analyzed their own language to determine whether their e-mails could be easily understood by an outsider.”

Both Brad and Eirik expressed a desire to repeat this activity. Eirik wrote, “I would like to try this again for many reasons, the most important being that this makes English more fun and alive for my Norwegian students.” Finding authentic opportunities to use a second language not only strengthens students’ abilities but it also helps native speakers practice their writing skills and learn just how connected we all are.

—Donna L. Pasternak is an assistant professor at the University of Wisconsin-Milwaukee and chairs the Early-Adolescence through Adolescence English Education program.

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## Extreme Makeover: Updating Class Activities for the 21<sup>st</sup> Century

Ever find yourself wishing Ty Pennington and his design team would roll their bus up to your classroom to help you renovate your old activities? Well, with a little imagination and some remarkable Web-based applications, you can re-design your old activities using free online tools.

The current generation of Web-based applications are social in nature, enabling users to collaborate and publish a wide variety of their creations. Teachers who see the value of social networking tools can use free applications that many of their students are already using outside of school. The features of Web-based applications make them appealing because they allow teachers to design rich, authentic, and engaging activities and assessments that catch and keep students' attention. This article will highlight collaborative writing tools, blogs, social bookmarks, photo sharing, and wikis.

### Collaborative Writing Tools

The simple task of writing a class newsletter can often prove to be impossible. How do you get 20 students to work on the same document? What do you do when a day's worth of writing disappears after someone pushes the wrong button? These issues disappear when free, Web-based applications such as Zoho Writer are used. Not only does Zoho maintain a restorable archive of all the changes and revisions of the document, it locks when it is being edited by another individual. The final product can be published to a Web site or posted directly to a blog. Google Docs and Spreadsheets

### Collaborative Writing Tools

Activity	Renovation Tool	Resources
Group Projects	Collaborative Writing Tools Productivity Tools Wikis	Zoho ( <a href="http://www.zoho.com">http://www.zoho.com</a> ) Google Docs and Spreadsheet ( <a href="http://docs.google.com">http://docs.google.com</a> ) Writeboard ( <a href="http://www.writeboard.com">http://www.writeboard.com</a> ) Gliffy ( <a href="http://www.gliffy.com">http://www.gliffy.com</a> ) Letterpop ( <a href="http://www.letterpop.com">http://www.letterpop.com</a> )

### Blogs

Activity	Renovation Tool	Resources
Reflective Journals Student Portfolios Integrated Units Newsletters	Blog	WordPress ( <a href="http://www.wordpress.com">http://www.wordpress.com</a> ) 21publish ( <a href="http://www.21publish.com">http://www.21publish.com</a> ) Blogger ( <a href="http://www.blogger.com">http://www.blogger.com</a> ) Edublogs ( <a href="http://www.edublogs.org">http://www.edublogs.org</a> ) Gaggle ( <a href="http://www.gaggle.net">http://www.gaggle.net</a> ) Think ( <a href="http://www.think.com">http://www.think.com</a> )

### Social Bookmarking

Activity	Renovation Tool	Resources
List of Content Resources	Social Bookmarks	Del.icio.us ( <a href="http://del.icio.us">http://del.icio.us</a> ) Diigo ( <a href="http://www.diigo.com">http://www.diigo.com</a> ) Ma.gnolia ( <a href="http://ma.gnolia.com">http://ma.gnolia.com</a> ) Backflip ( <a href="http://www.backflip.com">http://www.backflip.com</a> ) BlinkList ( <a href="http://www.blinklist.com">http://www.blinklist.com</a> )

### Photosharing

Activity	Renovation Tool	Resources
Picture Files Story Starters	Flickr Tools	Flicktion ( <a href="http://www.flickr.com/photos/tags/flicktion/">http://www.flickr.com/photos/tags/flicktion/</a> ) Creative Commons Licensing ( <a href="http://www.flickr.com/creativecommons/">http://www.flickr.com/creativecommons/</a> ) Third-party Flickr tools ( <a href="http://www.quickonlinetips.com/archives/2005/03/great-flickr-tools-collection/">http://www.quickonlinetips.com/archives/2005/03/great-flickr-tools-collection/</a> )

### Building Reference Resources

Activity	Renovation Tool	Resources
List of Content Resources Collaborative Lesson Plans	Wiki	PBWiki ( <a href="http://www.pbwiki.com">http://www.pbwiki.com</a> ) WikiSpaces ( <a href="http://www.wikispaces.com">http://www.wikispaces.com</a> ) WetPaint ( <a href="http://www.wetpaint.com">http://www.wetpaint.com</a> )

By Rena Shifflet and Cheri Toledo

## Multidisciplinary

and Writeboard provide similar functions. In addition, Google Docs and Zoho offer suites of tools: spreadsheets, presentations, databases, calendars, and more—all of which are accessible to multiple users.

Districts that struggle to provide licenses for concept mapping programs can use Gliffy, which works like other

concept mapping programs, also allowing students to collaborate on the same concept map. LetterPop provides newsletter templates and publishes the finished product to the Web.

### Blogs

Blogs have frequently been described as personal journals. However, educational blogs provide a forum for students to write for authentic audiences—those other than their teachers and peers. This encourages them to be more conscious of their work and take greater care in their writing. Most important, blog administrators are able to determine the visibility of and access to the blog.

### Social Bookmarking

Saving bookmarks is never a problem—trying to remember which machine you saved them to can create the problem! Social bookmarks allow you to store all of your bookmarks online and tag them with keywords and categories. Access and sharing are easy with any computer with an Internet connection.

### Photosharing

Digital cameras make taking and sharing photos simple. Students can post photos, use them in reports, presentations, blogs, or wikis. Photos can

be used to write Flicktion—a story inspired by a photo. Creative Commons enables members of photosharing sites such as Flickr to give legal permission for others to use their photos.

### Building Reference Resources

Most people are familiar with Wikipedia—an online collaborative encyclopedia. Wikis are powerful collaboration tools. Users can upload their content and edit the content posted by other users. Glossaries, bibliographies, and other collaborative writing tasks are perfect projects for a wiki.

### Conclusion

There is a dark side to Web-based applications; the potential for misuse is always possible. However, this possibility provides us with an opportunity to teach the responsible and ethical use of these collaborative tools as we promote 21st-century literacies. We must design activities for students to use these tools for constructive purposes, and teach them to be responsible, knowledgeable consumers and producers of information. By taking advantage of these free Web-based applications, we can renovate our old activities and provide new and technologically enhanced activities and assessments for our students. For more information, visit the Ed Tech Immersion Plus Web site at <http://coe.ilstu.edu/etip>.

—Rena Shifflet was an elementary educator for 33 years for the Heyworth School District. She recently received her EdD in Curriculum & Instruction, and will serve as an assistant professor at Illinois State University beginning this fall.

—Cheri Toledo, EdD is an associate professor in Curriculum & Instruction at Illinois State University. Toledo specializes in the integration of technology into teacher education curriculum and focuses her research on distance learning and the implementation of social networking tools in face-to-face, blended, and online environments.

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Integral to becoming a successful science student is the ability to communicate and effectively convey the results and understanding of classroom events to a variety of audiences. Students in our classes must regularly demonstrate their learning through participation in classroom activities, experimentation, demonstrations, and lecture. But how do we ensure that each student develops a firm grasp of the material? How are we sure that students are capable of communicating their understanding in ways other than through summative assessments? Blogging allows students to communicate their understanding of concepts, share information about current events, and interact with others.

One way is to use blogging through a daily or weekly log or journal of classroom events. Using an online blog editor or application such as iWeb, each student or group of students is assigned a period of time for which they are responsible for logging all events and lessons occurring as a part of the daily lessons. Students describe key concepts that were a part of the context of the lesson, but may not have been included in the formal notes. They take pictures of demonstration setups and apparatus, explaining how the experiment modeled a critical point of the lesson. A critical piece to their delivery of related information is their reference to the location of class notes (e.g., Web site, PowerPoint, etc.), homework assignments, and location of worksheets or handouts.

The daily log allows for several measurable objectives. It:

1. Allows the teacher to identify that, from the perspective of the assigned blog-group, the objectives of the lesson were met at a cursory glance of the blog content.
2. Provides access to important course content with relative immediacy to students who were physically absent or absentminded.
3. Serves as an excellent time line of the classroom events for the purpose of content review for chapter or unit exams as well as for the cumulative review of all course content in preparation for final exams.

The photos of key classroom events serve as a reminder to visual learners. We set up our blogs to e-mail us when changes are made. This allows grading and monitoring of the blog to occur easily.

Students can use the blog to post solutions to problems. Ben's AP students are solving a problem of the week and posting it online. Other students comment on its accuracy. As students prepare for the test, they will have a wealth of problem solutions with which to refer.

Assessment is critical to ensure the success of the daily log. So long as students are clear about the expectations and criteria for completing a successful journal, we found that generally they completed thorough and accurate information. The students served as monitors of quality control, as for many, their dependence during times of absence or review was critical. This year, an anonymous "grammar police" has posted corrections to entries.

**By Jared Mader and Ben Smith**

## Science

This blog should continue a day by day list of what we are doing in class. It is managed by students for students. Please help each other out by being complete. Each entry should contain: Lesson Information, Notes, Announcements, and Homework. Here is the blog list.

[Web User Login]

**December Period 1 Blog**

Posted by Benjamin Smith on Sunday, Dec 2nd, 2007.

(New Message)

3 Comments

[Post Comment]

**December Period 8 Blog**

Posted by Benjamin Smith on Sunday, Dec 2nd, 2007.

(New Message)

6 Comments

[Post Comment]

Daily blog usage in physics class

Posted at 1:20 PM EST November 29, 2007 | [Comments \(7\)](#) | [Delete Blog Entry](#) | [Edit Blog Entry](#) | [Report Abuse](#)**Jon's Problem**

Post your comments here.

AP Problem #2

d)  $F = m_1 a$   
 $f = \mu m_1 g \sin \theta$   
 $F = m_1 g \sin \theta$   
 $m_1 a = m_1 g \sin \theta - \mu m_1 g \sin \theta$   
 $a = g \sin \theta - \mu g \sin \theta$

b)  $F_f = \mu m_1 g \sin \theta$   
 $\mu = \frac{f}{m_1 g \sin \theta}$

c)  $F = F_f$   
 $F = M g$   
 $F = m_1 g \sin \theta + m_2 g \sin \theta - f - 2f$   
 $F = m_1 g \sin \theta + m_2 g \sin \theta - \mu m_1 g \sin \theta - 2\mu m_1 g \sin \theta$   
 $M g = m_1 g \sin \theta + m_2 g \sin \theta - \mu m_1 g \sin \theta - 2\mu m_1 g \sin \theta$   
 $M = m_1 \sin \theta + m_2 \sin \theta - \mu m_1 \sin \theta - 2\mu m_1 \sin \theta$

Integration of images with blogging

Another use of blogs that we have employed in the science classroom is through our own professional logs. Through a brief weekly or bi-weekly journal detailing the events of the week, we can look back on a month or series of months and evaluate the time elapse for major projects as well as how to improve efficiency within our system of workflow. Many times, putting into words the work that we have completed allows us to focus our attention on the professional objec-

tives that we must accomplish in the near future. The advantage of the blog is its public nature allowing others to comment and share ideas.

—Jared Mader has been a chemistry teacher for the past nine years and is now the director of technology at Red Lion Area Senior High School in Red Lion, Pennsylvania. Mader and Smith have been recognized as Keystone Technology Innovators in Pennsylvania and have presented at NSTA and NECC.

—Ben Smith has been a physics teacher at Red Lion Area High School for 19 years. He and Mader are the science curriculum specialists for L&L.

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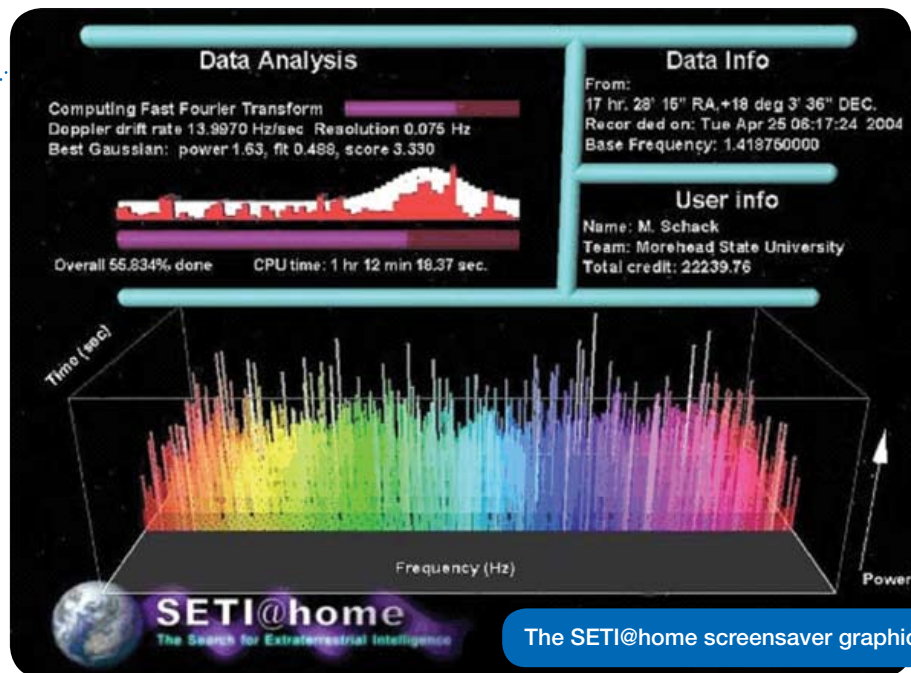
<http://www.k12imc.org/iste>

## Searching for E.T.

As fantastic as it may seem, your students can be involved in an authentic search for extraterrestrial intelligence. The SETI@home project is an ongoing science experiment harnessing the distributed processing power of idle computers on the Internet. By participating in this experiment, students can learn firsthand about science and technology, including content from the ISTE Standards.

Since 1999, the project has been analyzing data from the world's largest radio telescope in Arecibo, Puerto Rico. The free SETI@home software works automatically when your keyboard is idle, much like an ordinary screensaver, receiving and analyzing

By Mark Schack



The SETI@home screensaver graphic.

recorded radio telescope data. Results are sent back to the SETI computers at the University of California, Berkeley.

SETI scientists are now using nearly half a million volunteers to help

crunch the data. This creates a distributed computing network comparable to the world's largest supercomputers. So far, no signals from alien intelligence have been detected, but many

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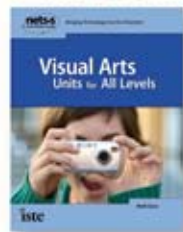
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young students, as well as seasoned scientists, are inspired by the possibility.

### Getting Your School Involved Is Easy

Just go to <http://setiathome.berkeley.edu/> to register and download the free SETI@home software. You will receive a file containing a batch of radio telescope data to analyze. Your students will be able to visualize the experiment in progress with a colorful and informative graphical display of the data analysis. The SETI@home Web site includes an explanation of the display and scientific information written at a level suitable for high school science and technology students.

### Scientific Background

Why do many scientists conjecture the universe might be teeming with intelligent life? To help your students get an idea about the scope of this

question, consider some very large numbers. Astronomers estimate there are at least 100 billion stars in our galaxy alone! Multiply this by a factor of 100 billion or more galaxies in the universe. Considering this in light of the discoveries of more than 220 extrasolar planets, and the probabilities become very intriguing.

### Inspiring Students' Interest in Science and Technology

Of course, there is only a very small probability your classroom computer will be the first to detect the subtle whisper of an intelligence beyond Earth. Despite the odds against such a profoundly historic discovery, students are encouraged by knowing they would receive credit and possibly great fame if a discovery were made from a data unit they processed. Considering the weighty implications

of this experiment, can you think of anything better your computers could be doing while you sleep?

### Resources

Astronomy resources, including a tutorial on how SETI@home works: <http://www.planetary.org/programs/projects/setiathome>  
 Berkeley Open Infrastructure for Network Computing: <http://boinc.berkeley.edu>  
 Burnie, D. (2001). *Concise science encyclopedia*. Boston: Houghton Mifflin.  
 Extrasolar planets: <http://exoplanets.org>  
 Mark Schack's SETI resources: <http://people.morehead-st.edu/fs/m.schack/setiproject.html/>  
 SETI@home: <http://setiathome.ssl.berkeley.edu>  
 Curriculum materials related to SETI and life in the universe: <http://www.seti.org/epo/litu-curriculum/>

—Mark Schack, EdD, is a professor of Curriculum and Instruction at Morehead State University in Kentucky, where he teaches educational computing and mathematics teaching methods. He is also a frequent presenter on the subject of SETI.



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