

## **Invited Article**

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# ***Free and Low-Cost Web Technologies for Adult Educators***

**Jennifer H. Helman**  
**Keila M. McCracken**

### **Abstract**

During a time when cuts in education budgets are a difficult yet undeniable reality, educators are forced into becoming more and more resourceful. The Internet holds a wealth of resources for educators looking to expand their current repertoire of tools for the classroom. The purpose of this article is to inform adult educators about a selection of free or low-cost web technologies that can be integrated into a variety of classroom settings.

### **GeoGebra**

<http://www.geogebra.org>

GeoGebra is a free, open source, award-winning mathematics software for nearly all levels of education that can aid an instructor in teaching geometry, algebra, calculus, statistics, or graphing. The software can be downloaded onto a Mac or PC or used through an applet in a web browser, and is available in over 40 languages. The software allows instructors to create custom applets that can be embedded into web pages, or shared with students or other instructors using GeoGebra's online community, GeoGebraTube. Instructors can create interactive worksheets that, for example, allow students to view the graph of a line,  $y=mx+b$ , and using slide bars, change the values of the slope and the y-intercept and watch in real time how the changing of those values impacts the line on the graph. GeoGebra can be used to aid students in

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**Jennifer H. Helman** and **Keila M. McCracken** both received their master's degrees from Indiana University of Pennsylvania in Adult Education and Communications Technology and are currently in the doctoral program in Communications Media and Instructional Technology at IUP.

learning concepts such as perimeter, area, circumference, angle, functions, tangents, derivatives, probability, correlation, and more.

Geogebra offers a free user manual, a user forum, and tutorials on their website to assist users from the novice to the expert. In addition, YouTube has thousands of videos related to the use of GeoGebra. Though it may be a result of the wide range of functionalities, GeoGebra is not a software that an instructor is likely to pick up and start using immediately. If the instructor thinks GeoGebra might be useful in their classroom, a great place to start is by going to GeoGebraTube and searching for existing worksheets relevant to her or his classes. For example, a statistics instructor can go to GeoGebraTube and search for “correlation” to find worksheets created by other GeoGebra users about regression lines and how the line of best fit and surrounding data points impact the correlation coefficient. Much potential exists for the utilization of this software in a wide variety of classrooms, but the instructor must be willing to invest some time in learning how to use it.

### **Diigo**

<http://www.diigo.com>

Have you ever wished that you could organize your Internet searches more effectively? Are your Internet searches conducted in multiple locations on multiple computers, resulting in sets of bookmarks that are not in one centralized location? Have you ever wanted to highlight important points in online news articles, or add notes to an online census report? What about the logistics of collaborating on a project where the Internet is a critical component of the research?

Diigo is a tool that addresses all of these concerns and more. Essentially, Diigo allows users to collect, organize and share research from the Internet with friends or colleagues. Diigo has a browser add-on that works with Internet Explorer, Chrome, Firefox, and Safari that allows users to bookmark, highlight, add sticky notes, and even capture screenshots, all of which are tied directly to the user’s Diigo account. Diigo can be used on any PC, Mac, Android device or iOS device, making your Diigo library accessible on virtually any computer, tablet, or smartphone. The user can share their bookmarks using Twitter, Facebook, Google+, or email. For collaborative projects, users’ individual libraries can be shared using Diigo’s group feature. One person can create a group and invite other Diigo users to join. When any person in the group

bookmarks a webpage, they have the ability to share that bookmark with the group, allowing other group members to see that bookmark.

The appeal of Diigo lies in the ability of the user to access their library without the constraints of location or device. Additional appeal lies in Diigo's ease of collaboration as well as its ease of use. Though Diigo provides video tutorials on the use of its various features, users will not necessarily need them. Their website is easy to navigate and once the browser add-on is installed, bookmarking and sharing websites is a simple process. Diigo for educators is free, however, there are limitations on page caching, screen captures, images saved from web pages, and technical support. Overall, Diigo has the potential to be a very powerful tool in a variety of classrooms that make use of the Internet as an information source.

### **Poll Everywhere**

<http://www.polleverywhere.com>

Most educators can probably agree that some students are more likely than others to speak in class—shy students are reluctant to speak in front of groups, other students can dominate conversation. How can an instructor ensure that all students have an equal chance of participating? Is it possible to give a voice to students who are reluctant to speak? Additionally, how can an instructor implement low-stake, quick checks for understanding throughout a lesson, including each and every student in the class? Though this sounds impossible, it is not, thanks to Poll Everywhere.

Poll Everywhere is a web technology that allows for real-time audience polling in a wide variety of environments. Poll Everywhere is free for up to 40 respondents; other levels of paid accounts exist ranging from \$15 per month to \$1,400 per month, and can include features like participant identification, response moderation, and technical support by telephone.

Instructors can construct questions that are open-ended, true and false, or multiple choice. Students are able to respond to questions using text messaging, Poll Everywhere's website, or Twitter with their answers shown on-screen in real time. When constructing questions, instructors have the option of downloading question slides that can be embedded into any PowerPoint presentation. This is useful for instructors who use PowerPoint as a lecture aid; they can cover a piece of content, include

slides that contain one or more questions about that content, and get instant feedback from every student about how well they understood it. Even for instructors who do not use PowerPoint, they can still show their questions to students on Poll Everywhere's website to achieve the same result.

Poll Everywhere provides a FAQ section on their website, as well as a YouTube channel with tutorials about how to use the tool. Even without consulting these resources, instructors should not have difficulty learning how to use Poll Everywhere. This resource can be extremely valuable for instructors in assessing the degree to which students are understanding course content, and does so in a manner that does not carry the pressure of an exam, giving all students an equal chance to participate.

### **Khan Academy**

<http://www.khanacademy.org>

Not every student learns the same way. If you have students that are struggling in your classroom and need extra help, Khan Academy is a good resource and is a free service available to anyone. Instructors are able to see a class report for all students, as well as having the ability to view any student's progress in detail. There are more than 3,500 embedded YouTube videos that cover a variety of subjects including science, finance, history, and test prep. Videos are approximately ten minutes in length. The practice feature allows students to practice and work at their own pace. Instructors can sign up to receive email updates when new courses and lessons are added.

Students are able to work through customized, self-paced practice exercises. Hints are provided with every math problem, if the student is having difficulty. The students also have the option to break the problem down into a step-by-step procedure in one click. Khan Academy also keeps track of the students' usage; what types of problems they work on, the types of videos she or he watches, and where they are spending their time. This data remains private, but students and instructors are able to view the statistics generated from the collected data. This lets students and instructors alike know if goals are being met. Instructors are able to view data about the class as a whole, or by individual student. When viewing the class profile, the instructor can gauge what topic they need to spend more time covering.

A nice feature that Khan Academy provides for its users is the “Map of Knowledge.” This map shows the challenges, skills, and concepts in which the student(s) can participate. Each student can start anywhere on the map. Khan Academy will give suggestions concerning the most pressing skills on which the student should work. Reminders are sent to students when they need to review a particular topic. A sign of mastery is when students have completed all of the challenges for the topic. Users can earn points and badges for learning, and this encourages them to spend more time working through the problems. Khan Academy provides instructors with a different way to teach subject matter, all the while allowing students to work at their own pace. The website is very intuitive to use, and does not require any intensive training to understand the functionalities.

### **Glogster EDU**

<http://edu.glogster.com>

Tired of using the same old PowerPoint? Spice up your instruction by using an online multimedia poster called a Glog on Glogster EDU. Instructors can create a private virtual classroom for their students by registering for a teacher administered account. Student accounts with safe logins and passwords can then be generated which allow the instructor to monitor all student activities through the learning process. The “Glog Criterion Interface” is easy to understand and use. Create a poster using the drag and drop features. Multimedia such as text, audio, video, images, graphics, drawings, and data can be included on the poster. Instructors are able to create curriculum-based projects for their classes that can be taught in the classroom or via remote instruction. These projects can then be assigned to students and the instructor is able to provide feedback after assessing the students’ work. The instructor has the ability to share students’ projects by embedding them in a blog, wiki, or web page. Single- and multi-subject dashboards can be created by the instructor that allows students to login using one login and password.

There are a few limitations to Glogster EDU. The free version allots ten student accounts, support via email, and has the capabilities for html5 (Next-Gen Glog) so Glogs can be viewed on mobile devices and tablets. There are various annual subscriptions available for those instructors that have more than ten students. The light version, \$29.95 annually, has the same features as the free version, but with the added benefit of chat support, student management, and the Glogpedia. In addition to that, the

premium version, costing \$99 annually, also includes these features, Re-Glog, class and project management, and phone support. Schools can also purchase multi-licenses. Before spending the money on an annual subscription, instructors or school districts can utilize the one month free trial feature to see if Glogster EDU is right for their classroom.

Glogster EDU is a fun way to present content to students. Instructors need no formal training to use this website, as it only takes a few minutes of exploring the site to grasp the concept of how to create a Glog. Instructors can use Glogster EDU for a variety of different projects for students and as a way to make class more entertaining.

### **Breaking News English**

<http://www.breakingnewsenglish.com>

“As the world’s news breaks, teach it!” Breaking News English incorporates news stories as the primary focus of its lessons, which is the main attraction of this site. All lessons provided are free. Recent news stories are transformed into English lessons directed at ESL and EFL students. The database of lessons is updated every three days to include the most recent news stories. All lessons posted can be downloaded in PDF format and audio files can be downloaded as an MP3 file or via a podcast. Eight online quizzes are included in each lesson as well as handouts that are replicable. One downside to this website is that it is littered with ads. Breaking News English is a phenomenal site to help non-native English speakers learn how to speak English.