# Multi-Media Tools for Online Educators

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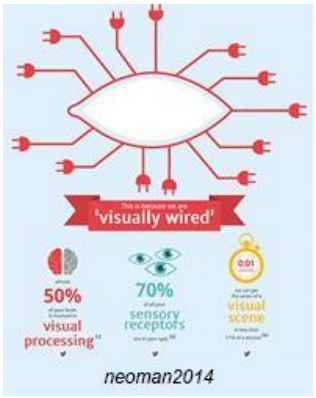
The age of e-learning has created an unprecedented need for personalized, quality content. Interactive video presentations and smart boards have replaced the filmstrips and overhead projectors of earlier times. According to an article in the New York Times, in 2011 alone, the New York City School District spent over seven hundred million dollars to upgrade internet access and technology in the classroom (Otterman 2011). Such efforts should be applauded, however, when educators lack the skills and software to enhance the learning experience, a laptop or a tablet serves as nothing more than an old fashioned textbook with an overly complicated interface. In other words, online learning, devoid of quality learning materials, simply becomes learning online.

E-learning affords educators the opportunity to include video and interactive activities as part of the learning experience. The variety and sophistication of tools available to educators is increasing exponentially and presents amazing opportunities to engage learners in ways never before considered. Unfortunately, many of these tools come with price tags to match their sophistication, and while administrations are eager to provide the latest educational gadgetry, they are often less forthcoming with the necessary funds for software and training. Luckily, there are a growing number of free tools available.

The following chapter focuses on strategies to add multimedia to online courses; more, specifically it focuses on visual, auditory, and presentation tools that online educators and course designers can use to present content to learners in various ways.

## The Visual




Research indicates that approximately 65 percent of students are "visual learners" (Ha, 2005). While there is a growing debate on the merit of learning styles (Rohrer & Pashle, 2012), research on the brain suggests that vision is our most powerful sense. According to current research, fifty percent of our brain capacity is involved in visual processing and over two thirds of our sensory receptors are in our eyes." (Merieb & Hoehn, 2007) Therefore, given this growing demand for visual content coupled with brain research, online course designers need to find ways to create content so that they include images and infographics to support students' ability to learn, retain and use what is being taught. The example on the right epitomizes the power of infographics. In a single picture, this graphic summarizes the content of this paragraph. This is not to say that graphics should be

added like a sprinkling of sea salt to a kitchen recipe. Too many, or muddled graphics can do more harm than good. This is why the programs discussed below are important. Teachers know, more than anyone, the message they want to convey to their learners, and they need the means to create and tailor that visual message.

Most educators are not graphic designers. They do not have the funds for expensive software or to pay professional designers to create content for them. Below are some examples of free graphic design software. This software, when combined with personal images or free to use graphics from the web, can produce effective and entertaining results.

## PicMonkey


PicMonkey (picmonkey.com) is a web based application which can be used to edit photos, create designs and add layers of text to create banners. Faster, simpler and much cheaper than Adobe Photoshop, it provides most of the tools needed to create cost free content, while at the same time providing the programming power so that the user's creativity is not hampered by the constraints of the software.

The program's basic features: Crop, Rotate, Textures, Overlays and one-click effects are often times superior to those found in much more complex and expensive software. Advanced features such as Curves, Touch Up, Design and Collage allow the user to create stunning and effective images. PicMonkey's cloud based service provides users with the ability to upload photos from their computer and from services such as Facebook, Flickr and Dropbox. PicMonkey was recognized as a Top 100 Website in 2013 by PC Magazine. The PicMonkey Blog contains detailed tutorials which will, almost immediately, have the user creating incredible images.

## Gimp

GIMP (gimp.org) is an acronym for GNU Image Manipulation Program. It is a free downloadable program for retouching photos, composing images and creating simple animations in the form of animated GIFs. The software's versatility means it can be used by novice and expert alike. Additionally, GIMP's open sourced format allows it to be run on both the Windows and Mac operating systems.

If there is a downside to GIMP, it is that, for the more advanced user, there is a relatively steep learning curve. It has the power of higher end image editing programs, such as Photoshop, but lacks the user friendly interface and intuitive design of its higher priced competitor. However, given the cost versus power ratio, most users are willing to invest the time to learn the nuances of the program in order to achieve unparalleled results.

One of the advantages that e-learning has over more traditional models is its ability to display animations. Thoughtful, well presented videos enhance any learning experience, simply

because they relieve the learner of the difficult task of putting pieces together. Instead of concentrating on visualization, the learner's attention remains focused on absorbing the facts. Although this option is incredibly useful, animation programs, in the past, have been costly and difficult to use. While the user difficulties remain, the open sourced Synfig Studio has eliminated the cost.

## Synfig Studio

Synfig Studio (synfig.org) is the free alternative to programs such as Adobe Flash and Toon Boom. The program will not turn an individual into Walt Disney overnight, but its interface has improved and its ability to create both vector based and graphic based animations makes it an ideal choice for the animator on a budget. Synfig Studio also provides both a user manual and tutorials which clearly demonstrate, to the user, how to successfully bring images to life. Mastering the interface allows the user to generate creative and engaging content.

The programs discussed above represent only a small sample of what is available. Each user will have a personal preference based on the program's interface and their personal needs. Image editing software allows educators to present lessons with graphics specifically designed to enhance their unique learning experience. Pictures and animations have power, but in the world of e-learning, these pictures and animations can be further enhances by the addition of sound.

### The Audible

Graphics and animations are only a portion of a well-presented multimedia message. Educators must have the ability to project themselves into an online classroom. Students learn more when computer based learning resembles human to human contact (Clark & Mayer, 2011). While a photograph on a syllabus serves as a satisfactory introduction, nothing brings an instructor more into a virtual learning environment than their own voice narrating their presentation. Programs such as Voki create wonderful avatars and provide an easy means to create the spoken word from the written one, but a computer generated voice creates a feeling of distance and aloofness. Learners want to know their teacher. They want to see them in their mind's eye and they want to hear them as material is being presented.

All computers contain some sort of software to record audio tracks, however very few individuals can record a perfect presentation in a single take. This generally results in multiple attempts to get it right the first time. Also, quality soundproofing equipment is expensive and without this equipment most home studio recordings emerge with echoes and noises which lessens the audio quality and therefore its effectiveness. Audio editing software alleviates these problems. Not only will the programs discussed below allow the individual to eliminate the outtakes, but they also perform noise reduction and filtering functions, improving the quality of any recording.

## Audacity Studio

Audacity (audacity.sourceforge.net) is the most popular audio editing freeware for a reason. Simply put, it does everything. More importantly, it does everything with a user friendly interface and intuitive design. It is a multi-track recording program which means words and music can be mixed to a perfect balance. This feature also means that two distinct series of dialogue can be mixed together to form a complete conversation. Available for multiple Operating Systems, Audacity also includes tools which will eliminate noise, change the speed or pitch of a segment and allow the user to cut, copy or paste from anywhere in the recording. This last feature is particularly useful for those who have difficulty with pace when speaking. If the speaker speaks too quickly, gaps of silence can be inserted between words and phrases. These same gaps can be eliminated should the speaker take too much time between expressing thoughts. This feature also permits the user to eliminate the "ums" and "uhs" so prevalent in formal presentations.

## Wavosaur

Software is all about choice. Quite often different programs have the same features, but present these features differently. Such is the case with Wavosaur and Audacity. Wavosaur (wavosaur.com) is also a multi-track audio editor which allows batch file processing, that is to say it can apply the same effects to multiple files with a single keystroke, and audio file conversion. The primary difference between the two is the number of toolbar shortcuts available to the user. While Audactiy's interface operates primarily on a drop down menu principle, Wavosaur offers the user multiple buttons and multiple windows to accomplish their audio editing. Also, while Audacity is available to all users, Wavosaur relies solely on the Windows Operating System as its platform.

Audio editing software is incredibly useful for delivering audio content such as podcasts and radio plays. These programs provide educators with a means to enhance their lessons without spending a great deal of time worrying about the flawless take. However, there is more to audio than just the spoken word. Music can be very useful when presenting a message. Sadly, most educators are not musicians, and if they are, their experience is limited to a single instrument. There are creative commons alternatives for music, but generally most music is attached to a copyright. There are, however, programs which can transform even the most musically disinclined into the conductor of a full-fledged symphony orchestra.

## Linux MultiMedia Studio


Unlike Audacity and Wavosaur, which rely on the user to provide content for editing, Linux MultiMedia Studio (lmms.sourceforge.net) provides the user a means to actually create

music. LMMS is a Digital Audio Workstation similar to the well-known programs FL Studio and GarageBand. Based on a drag and drop principal, LMMS allows the user the ability to transform and sequence audio samples to create music. Additionally, the program provides a means to create drum beats and bass with the click of a mouse. This software brings the band that every teenager wanted in high school into their personal computer.

As the name suggests, Linux Multimedia Studio is available for the Linux Operating System, but the program works equally well with Windows. It provides the keyboard savvy and musical novice alike with a means to play multiple instruments through its ability to function as an audio synthesizer. By selecting the virtual keyboard option and inputting a guitar sample, it is possible to program a series of musical notes which will transform even the most tone deaf performer into Segovia.

Until computers evolve and provide educators the ability to project taste, smell and touch into the virtual world, technology will limit their influence to the senses of sight and sound. Online learning is a multi-media environment. Multi-media means just that, multiple forms media woven together to create the learning experience. Online images and text devoid of sound, again, result in nothing more than an old-fashioned textbook with a complicated interface.

### The Presentation

Thus far, the audio and the visual have been discussed. Separately they are quite powerful at delivering a message, however, it is only when the two are combined that they reach their full potential. Since its debut in 1991, Adobe Premiere has been the gold standard for the creation of multimedia content. Unfortunately, this program has always carried a gold standard price. Even worse, Adobe has discontinued the sale of the program as stand-alone software opting instead for a cloud-based subscription service. While cloud-based programs are gaining popularity, at times, they are not a convenient option. There are, however, freeware programs that offer the tools which educators require. Such programs may not have the power to create Pixar Studio quality productions, but for the normal user, they function quite well.

## Avidemux

Avidemux (avidemux.sourceforge.net) is a multi-platform program which serves as a cost-free replacement to Adobe Premiere. The program offers multi-track editing and a wide range of both video and audio transitions. Additionally, Avidemux provides the user with real time playback, which allows the results of edits to be previewed prior to rendering the entire video. This advantage saves the user countless of hours of staring at a monitor while a complete version of the presentation is being created. For those interested in green screening, the program provides a Chroma Key option which will allow any user to render a background color invisible. This option is both entertaining and useful should the user wish to situate themselves in an exotic locale while making their presentation.

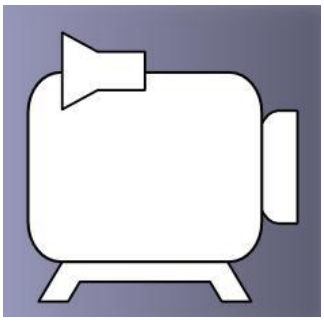
Additionally, Avidemux provides the user with a wiki document, which serves as both a user's manual and tutorial page. This is important in that, although the program contains a great many options and is quite powerful, its interface will present challenges to those who are new to video editing software. Surprisingly, Microsoft offers a much simpler and cost free alternative.

## Windows Movie Maker

Based on the concept of drag and drop, Movie Maker's (windows.microsoft.com) user friendly interface provides a quick start alternative for the video novice. While it lacks the sophisticated tools provided by Avidemux, The program provides the user with a simple means of tying video clips together with transition options which are both entertaining and captivating. Movie Maker also allows the presenter to add audio tracks to a video presentation thus providing a means to record and edit the audio portion of a lecture and then adding the visuals later. Like Avidemux, Movie Maker permits the import and export of a wide range of file formats, and while Movie Maker does not offer the more sophisticated options of other video editors, it provides more than enough tools for the average user to cobble together a slideshow or a class video montage.

While video is an incredibly useful tool for making presentations and sets e-learning apart from its more traditional counterpart, there are times in which an old school approach should be melded with modern technology. One of the more useful tools for a teacher in a classroom is the old-fashioned chalkboard, or its more modern day equivalent, the white board. Thankfully, there are digital tools which combine the board's functionality with the ability to record and reproduce those interactions in an e-learning environment.

## CamStudio



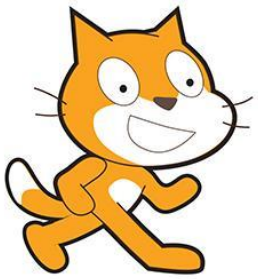
CamStudio (camstudio.org) is the freeware equivalent to the popular Camtasia program. Like Camtasia, it allows the user to capture their computer screen and combine it with audio commentary. After the video and audio are recorded, CamStudio allows the user to make pan and zoom edits in order to highlight various sections of their presentation. Such applications are regularly used to present YouTube - How To videos and are a useful tool when it is necessary to show learners a step by step process. When combined with whiteboard freeware such as PixiClip or Desktop Whiteboard, CamStudio acts as a virtual classroom allowing educators the opportunity to provide solved examples to their learners without consuming a great deal of time with typing and formatting. While it is possible to "write" on these whiteboards using a mouse, a hardware graphics tablet is recommended. Sadly, these are not available for free, but can be found in the fifty dollar range and enable educators to write rather than type their presentations, which saves time spent editing.

Content creation and presentation are important, however, where e-learning is involved, they are just the tip of the educational iceberg. E-learning's true strength lies in its ability to provide an interactive environment for learners. Interactive experiences encourage creativity and inspire thought. There are programs available which give users the ability to design such exercises with little or no prior computer programming knowledge.

### The Interactive

Computer programming, as a skill and a practice, is accessible to all. At its heart, programming is founded on logical problem solving. As students learn how language is applied for cause and effect, they begin to understand the fundamentals of how complex processes work. As they become more comfortable with the workings of these processes, students begin experimenting. This is not an easy transition, and is littered with failures, but these mistakes encourage them to evaluate their work, make changes, and ultimately persevere to find a solution. Having a working understanding of this approach to problems and solutions is a skill which can be applied to in every facet of their lives.

## Scratch



Created by Massachusetts Institute of Technology as a tool to introduce young students to programming fundamentals, Scratch (scratch.mit.edu) has won nothing but critical acclaim since its inception in 2003. Scratch uses an easily accessible format which encourages creativity and creation without the many of the challenges that occur during the normal programming process. To accomplish this, Scratch utilizes a drag and drop interface which allows users to collect snippets of code and make changes to program graphics, called sprites, and variables quickly and easily, allowing them to see how things change. Students need not worry about coding errors, which enables them to efficiently reach a desired outcome with little discouragement. Scratch offers the same advantages to educators who wish to develop interactive exercises without spending the time to learn a computer language.

To use Scratch, the user may either download the program to their computer directly or utilize the online application working directly from their internet browser. The online format is recommended as it requires less set up. As with any good application, there are a number of tutorials which promote understanding and jump start the learning experience.

## App Inventor

Similar to Scratch, MIT also offers the App Inventor (appinventor.mit.edu) program. While the user interface is similar to that of Scratch, App Inventor is specifically designed to develop applications for cell phones and tablets. Even though App Inventor can be used as a stand-alone application using its phone emulator, the

program works best when connected to a wireless network. Once the program has been downloaded, the user simply ties their computer and their wireless device to the same network and all changes performed on the computer are displayed on the device. Given the prevalence of tablets in the classroom, App Inventor serves as a valuable tool for providing interactive content. Sadly, this program only works in an Android environment, and the applications developed using App Inventor cannot be experienced on the Apple devices such as the iPhone or iPad. That fact aside, for educators who wish to use tablets in their classroom for something other than e-readers, this program represents a great option.

Programs such as Scratch and App Inventor offer great opportunities to learn the logistics of programming, but as previously mentioned they are platform limited in their application. Unfortunately, in order to provide a platform free experience, some degree of programming skill is required. Recent developments have seen the internet and wireless devices move away from an Adobe Flash based standard for interactivity. In fact, Adobe recently announced that it was discontinuing its support of Flash altogether. Instead, both Adobe and content developers are moving into a realm which is an amalgam of HTML5 and JavaScript. While such a move presents challenges to the layman, there are websites available which can ease the transition.

## Kahn Academy Coding


Khan Academy (khanacademy.org) has humble beginnings. Sal Khan began creating YouTube videos to tutor a younger cousin and those tutorials quickly grew into a massive website with thousands of lessons and interactive activities. Having gained well deserved notoriety for its video tutorials, in 2003, Khan Academy began offering computer programming lessons for beginners. The language used, Processing JS, is a modified form of JavaScript designed specifically for graphics and animation. The major difference between Khan Academy and the previous two programs is how users interact with the language. In Scratch and App Inventor, users drag and drop code snippets to bring their creation to life. Khan Academy forces users to type their code in order to see their results. Such methods, while presenting more of a challenge, offer a greater sense of accomplishment in that the user created something from nothing. It is not necessary for individuals to start with Scratch before moving on to Khan Academy, but such a progression provides the user with an understanding of basic computer functions and facilitates the move to the real life programming world. Additionally JavaScript programming and HTML5 are understood by all browsers and platforms thus ensuring that the results of these efforts are available to all.

### Moving Forward

To be sure, the programs listed above are not the only offerings available. As processor speeds and bandwidth increase, new and even more amazing freeware will be created. In the past

twenty years, the internet itself has evolved from rudimentary graphics and text based enterprise into one stop source for all things. Such an environment offers endless opportunities for educators. Where once they were limited by the constraints of software purchased by a second tier administrator, now if something can be imagined, it can be created. More importantly, with programs such as Scratch, it can be created without the need of spending hours typing and debugging computer code. The implications are obvious. In a world once ruled by functionaries and men in pocket protectors, now, the gates of the educational kingdom have been flung open wide.

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