
Web 2.0 Tool Recommendations for Teachers

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Abstract – The use of social media in education has become increasingly important. Teachers can facilitate discussion of a specific topic on Facebook, share pictures of field trips on Instagram, obtain teaching material from Khan Academy, teach a foreign language through podcasting, or even report cases of plagiarism at smallseotools.com. This paper addresses the challenges in educating “digital native” learners, and recommends Web 2.0 tools that can help educators better motivate and communicate with these students.

Keywords – Education, Teaching and Learning, Technology, Web 2.0, Software as a Service (SaaS).

I. DIGITAL EDUCATION: CONTEMPLATION

Information technologies have overtaken education like a tsunami overtakes its shore. Learning has become a do-it-yourself, just-in-time exploration of multiple sources and knowledge construction for a particular goal or interest [1]. Nowadays, most students have mobile devices, through which they can communicate with their classmates, acquaintances and friends anytime and anywhere. Even though students live their lives around Social Networks (SNs), many teachers are cautious about SNs as they may become distractions in classroom [2]. Instant messengers such as Facebook (FB) Messenger, WhatsApp and Line often become media for gossips and pure communication. According to [3], students could focus on a task for an average of three to five minutes. Their major source of distraction was technology: (1) the availability of mobile devices in their learning environment, such as iPods, laptops and smart phones, (2) texting, and (3) access to FB. After all, the very design of SNs was for chatting and sharing pictures, links and videos, rather than for formal learning purposes.

With that said, many schools use SNs in conjunction with learning management systems (LMS) such as Blackboard, Moodle, and Schoology in classroom [4]. Using LMS, teachers can manage resources (files, labels, folders, URLs and pages) and activities (assignments, forums, glossaries, journals, lessons, quizzes, questionnaires, wikis, chats and surveys). Teachers may, for example, upload notes on Moodle and start a discussion on FB. Some schools and universities even use social networks (SNs) to reach out to the younger generation during student recruitment.

Traditional lecture is no longer a requirement for successful learning experience. [5] In the formal academic path (i.e., kindergarten, primary, secondary, bachelor, master, PhD and Post-doc), the teacher (the tutor, the lecturer or the professor) is the authority figure in classroom and the deliverer of teaching content. The teacher decides on the content, expected outcomes, assignments and teaching tools, and manages the learning processes. Yet, depending on the student’s knowledge background and the nature of the topic, the teacher’s role can vary from a guide that walks the student through every step, to a mere moderator. For instance, Mathematics and Urbanism courses usually require two completely different approaches. The former adopts a traditional whiteboard/ handwriting approach to present mathematical steps, expressions and solutions in many possible ways. In this case, the teacher acts as a teacher. The latter relies on Geoweb solutions (e.g., myGeooffice.org and arcgis.com/ home/ index.html) and social media. Hence, the teacher acts as a moderator [6].

Yet, as schools become more mobile and internet-connected, modern educators face many challenges for years to come [7]. Teachers have to draw a line between being professional and being entertaining. In an electronic classroom, the teacher's main role is to provide assistance, guidance and information regarding the benefits and drawbacks of technologies. Using the WWW extensively in classroom, teachers have to teach their students to be responsible, productive, self-aware and self-disciplined "netizens."

Expectation of students varies. While some students rely on traditional teaching, some prefer to be self-taught (using electronic books, SNS, etc.) What Bill Gates, Michael Dell, Larry Page and Mark Zuckerberg have in common is that all of them dropped out of university and became self-made authorities in their fields. As [8] phrased it, "formal education will make you a living; self-education will make you a fortune."

These lead to an ongoing debate between formal (intentional) and informal (incidental) learning. The formal approach promotes paced learning, which can be fit into the school's schedule. Such conventional approach aims at giving everyone an equal opportunity to receive education, and hence it is "one program for all." This often leads to superficial learning, that is, students memorize content just for reciting it in a quiz or an exam, and forget everything afterwards. In this case, top-down instruction is necessary. Many parents hire private tutors or devote their own time to supervise their children after school. Given the high divorce rate nowadays, this becomes a heavy burden to some modern families, in which a single parent has to juggle between a full-time job and household duties [6].

On the other hand, self-paced rhythm, fulfillment of immediate needs, personal empowerment and flexibility are characteristics of informal learning. Informal learners are eager to obtain new information, and they rush to the last level of Bloom's taxonomy to generate tangible outcomes. ICT courses are good examples of the informal approach. They created the famous computer geeks community. Even though informal learning is financially cheaper, learners pay the costs of sweat, hard work and high uncertainty about the final results. In addition, there is no formal diploma or certificate issued by any official institute. In other words, informal learners bear the risk of having no formal recognition in society when they need to apply for jobs.

Another key difference between formal and informal approaches is discipline of students. In formal education, discipline is the driving force of learning. For example, in the formal academic path, students from age 3 to age 18 have to follow an official schedule. Such fixed structure gives discipline to students.

On the other hand, the driving forces of informal learning are the learners' own life experiences, curiosity and capability. Informal education does not rely on discipline; rather, it seeks innovation, flexibility, fun and socialization (e.g., blogs, wikis, visits to museums and exhibitions, and participation in fairs and seminars). Having the freedom to choose according to their interests, self-motivated learners have greater desire to learn [9]. This is particularly true for those who excel in drama, music, sports, photography, painting, film making, fashion design, industrial design and other creative areas. An informal setting makes it easier to identify the potential of a creative project than a formal one. To toddlers and teenagers with special needs, for instance, an informal setting is particularly helpful in discovering their creativity. Also, in fields like humanities, an informal setting can better showcase the talents of students to future employers [6].

In fact, as explained in [10], formal and informal learning are not necessarily exclusive of each other. Rather, the two can work as complements, and both should be made available to individuals simultaneously. A combina-

-tion of formal and informal learning is called, “blended learning.” One possibility is to take formal learners to an informal environment. For example, an English teacher can bring a class to a farm, where students can experiment harvesting vegetables and fruits and be much more motivated to learn the farming vocabularies [11]. Web 2.0 tools (sites.google.com/view/cool-tools-for-schools) play a significant role when both formal face-to-face teaching and informal learning through digital media are offered in a classroom. One application is the use of inquiry-oriented sessions (e.g. WebQuest). The teacher can first give a conventional introductory lecture and then supplies related questions, research assignments and assessment requirements at Zunal.com, so that students can explore Web sources on their own.

Therefore, a merger between formal and informal learning styles is feasible. Schools can balance traditions and enjoyable, interactive learning in a customized learning framework, in which students have the freedom to choose from a wide range of topics according to their interests. In doing so, schools have to maintain motivation and engagement of students even in a big classroom, say, a class size of 30 or above. It is essential for lessons to be presented in a way that students are able to understand, experience what is being taught (i.e., “learning by doing”), and appreciate its relevance.

Today, interactions between the three agents - learners, educators and knowledge - largely depend on digital media. This leads us to rethink the way we teach and learn with digital technologies. It is common that a teacher writes a blog entry for each session, creates a social classroom on Edmodo, and uses Google Hangouts to communicate with students. There are many benefits in using Web tools in education. For example, Gonzalez (2013) explained why it was beneficial for students to produce videos, instead of presenting their work more easily and quickly on paper. The first reason is student engagement. Students live in a high-tech world and giving them tools to participate in that world keeps them interested. The second reason is the need for 21st century skills, which require students to develop competency in IT and media. Creating online videos is a way to practice those skills. Students do not only learn about video production, but also learn how to share them, from uploading files to YouTube, to creating links and embedding the videos in other sites [12].

South Korea is one of the pioneers to adopt digital media in education. It gives us a glimpse into the future of education. South Korea has the fastest internet connection speed in the world. An average South Korean spends up to 18 hours a day on social media using their phones. In schools, even little children experience the virtual world at a young age. Without social media, many South Koreans feel lost and without a purpose in life. Yet, such “internet addiction” makes South Korea a leading country in mathematics, science and other related areas.

The goal of this paper is to recommend a set of Web 2.0 tools that can enhance the way teachers deliver their teaching material to students. The Web tools presented in the following section represent merely a subset of those that are available (sites.google.com/view/cool-tools-for-schools). Most of the recommended Web tools in this paper (with only two exceptions) have the advantages of being free-of-charge and open to all.

II. SOFTWARE AS A SERVICE (SAAS)

A. Types of Learners

Knowing the student’s profile is a crucial step of teaching preparation. A student’s profile includes his/her background, age, gender, language fluency and expectations [13]. Developed by Richard Felder and Barbara Soloman of North Carolina State University, the index learning style (ILS) questionnaire

(webtools.ncsu.edu/learningstyles) enable teachers to analyze a student’s profile in four dimensions: sensory-intuitive, visual-verbal, active-reflective, and sequential-global (see Figure 1).

A majority of students we encounter in University of Saint Joseph are sensory, visual, active and sequential learners. The teaching strategy is to incorporate images, graphs, videos, diagrams and real-life examples (particularly those that are closely related to the students’ own environment) and present facts, relationships, rules, restrictions, sequences and consequences of actions in an orderly manner.

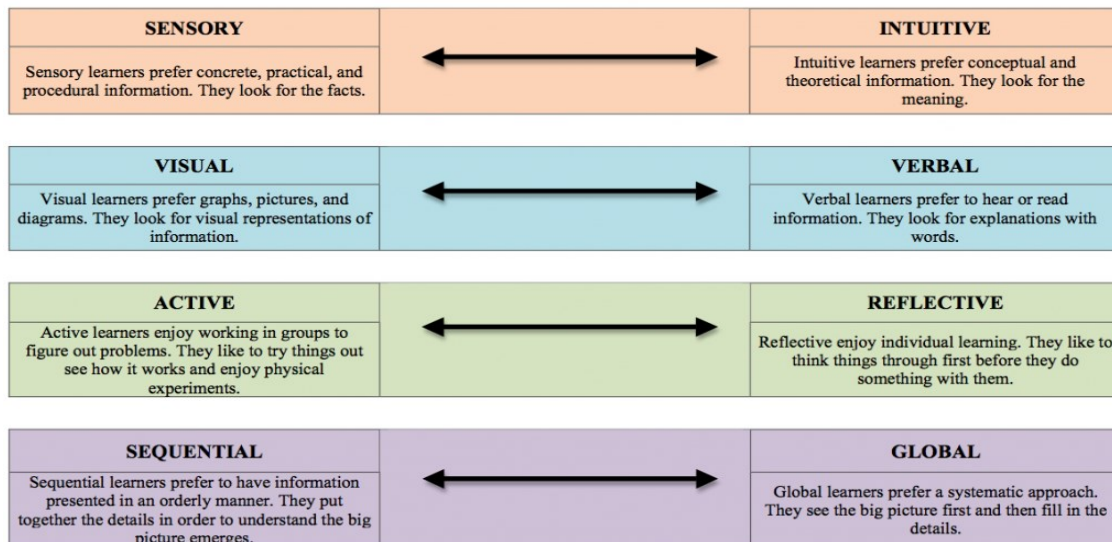


Fig. 01. The four dimensions of ILS questionnaire. (Iniaq.myblog.arts.ac.uk/2013/03/09/week-9-explaining-learning-styles-theories).

B. Presentations

Prezi (prezi.com) is a cloud software similar to Microsoft Power Point. Prezi has additional features such as zoom in/out, import of PPTXs and PDFs, YouTube videos embedding and collaborative writing (up to 10 users). Prezi’s storyline allows navigation from slide to slide, and from scene to scene [14]. Users can publish a storyline online or download it as a file for offline usage. Figure 2 shows an example of a storyline. Another useful tool for teachers is SlideShare (slideshare.net). When preparing for a presentation, teachers can first research and take reference of slides created by others at SlideShare. Both of these Web tools can help teachers improve their presentations in class.

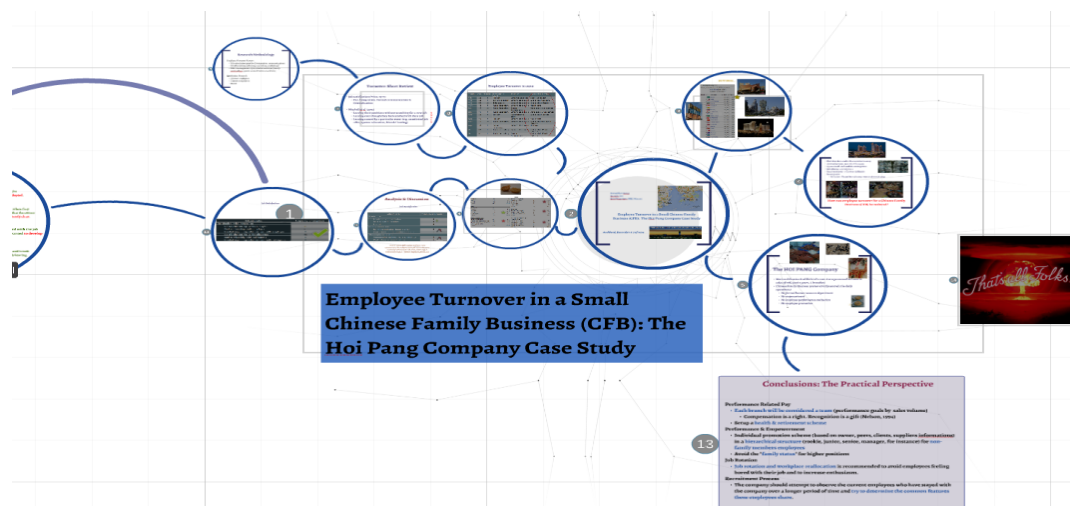


Fig. 2. A Prezi storyline.

E. Sound Editors

Music is part of our daily lives. The ability to edit sound files is necessary for teachers of all educational levels. Audacity (audacityteam.org/ download) is a free software developed by a group of volunteers and distributed under GNU General Public License (GPL). It is an easy-to-use, multi-track audio editor and recorder for Windows, Mac OS X and GNU/ Linux users. The interface of Audacity is available in several languages. Not only can it record live audio, but it can also edit WAV, AIFF, FLAC, MP2, MP3 and Ogg sound files, cut/ copy/ splice/ mix sounds and add effects such as changing the speed or the pitch (see Figure 5). As well, teachers can extract sounds from movies at audio-extractor.net and remove sounds from videos at audioremoover.com.

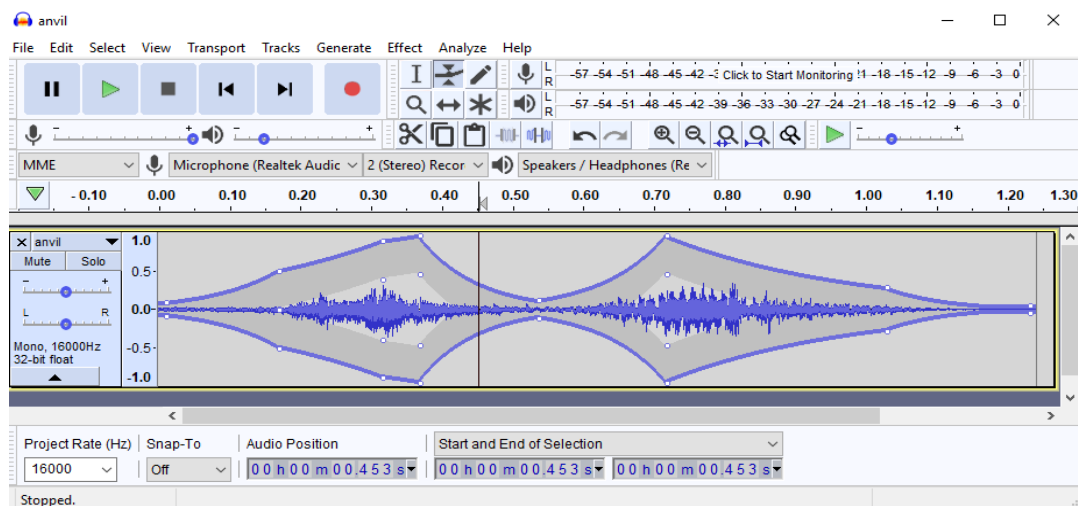


Fig. 5. An example of how Audacity Envelope Tool controls the pitch of a MP3 file.

F. Film Editors

Many teachers show short video clips on YouTube in class. Occasionally, teachers need to extract a short section of a film, combine multiple movies or add pictures to a video. First of all, teachers can download the video clip through y2mate.com. For film editing, there are dozens of options like iMovie (apple.com/imovie) and VideoPad ([nchsoftware.com/](http://nchsoftware.com/video-pad) videopad). Worth recommending is Windows Movie Maker (topwin-movie-maker.com). It is an easy-to-use and powerful video creating and editing application software, featuring video effects, transitions, subtitle, credits, audio tracks and timeline narration.

It is also worth to highlight the capability to capture your screen video/sound with Free Cam (WMV format with a HD quality of 720 pixels per inch) at freescreenrecording.com for creative video lessons, e-Learning presentations and post in social media.

G. Animation Editors

PowToon (powtoon.com) is a web-based software that allows users to create animated presentations in a short amount of time by manipulating pre-created objects, imported images, provided music and user-created voice-overs [17] (see Figure 6). This tool is useful for end-of-unit projects, in which students demonstrate what they have learned by running their own lessons. As suggested by [18], instead of a constructed response question, a book report or a feature article, students can write a script and produce a video to demonstrate the same kind of learning. Moreover, in a technical course, like Statistics and Econometrics, having students produce a PowToon to teach a challenging concept can reinforce their understanding in a playful way.

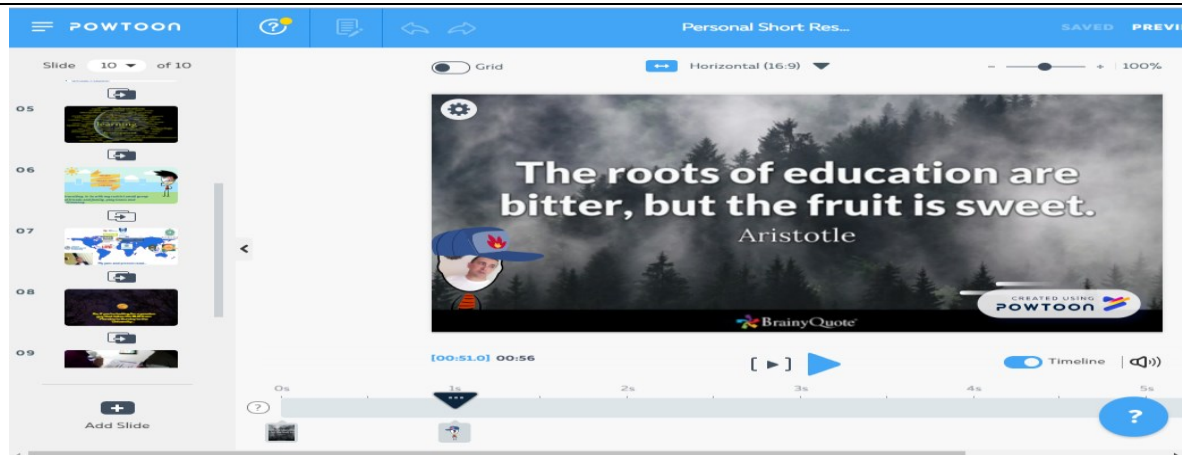


Fig. 6. Creating a presentation with PowToon. As a reference and much like cartoons, comics (created at makebeliefscomix.com) can help students grasp a foreign language. Students can learn vocabulary, reading comprehension, listening, speaking and writing from comics.

H. Surveys

Data touches our daily lives. People record personal data, such as fitness, banking and social media data. Companies learn about their customers through “big data.” Data is equally valuable to education. Schools collect data to keep track of students’ performance, among which are quiz results, opinion polls, email notifications of late homework submissions, etc. Master and PhD students obtain data to evaluate their research questions, and to test their hypotheses statistically [19]. Monkey Survey (surveymonkey.com) and Google Forms (google.com/forms) are two useful Web tools for creating and managing surveys that contain various types of questions, each designed for a specific purpose. The formats of questions include short-answer, multiple-choice, checkbox, drop-down menu, file upload, multiple-choice-and-checkbox grid, Likert scale and date-and-time input.

I. Image Editors

A picture explains a thousand words. However, a picture can send the right message only if its creator has decent drawing skills. MS-Paint 3D, Corel Draw, GIMP and Adobe Photoshop are some of the popular image editors [20]. Sketch (sketch.io/sketchpad) is a free online image editor with similar features, such as cropping, calligraphy, clipart, zoom, import/export and pixel filling. A more innovative Web tool is AutoDraw (autodraw.com), which incorporates Artificial Intelligence (AI) machine learning into image editing. AutoDraw uses drawings from talented artists to help users create neat images efficiently. Basically, it is capable of guessing what a person is trying to draw and makes an image suggestion. As shown in Figure 7, AutoDraw can turn a terrible drawing of a shark (on the left) to a better version of it (on the right). This makes drawing more accessible and fun. AutoDraw should be particularly useful for kindergarten and primary teachers and should be popular among their students.

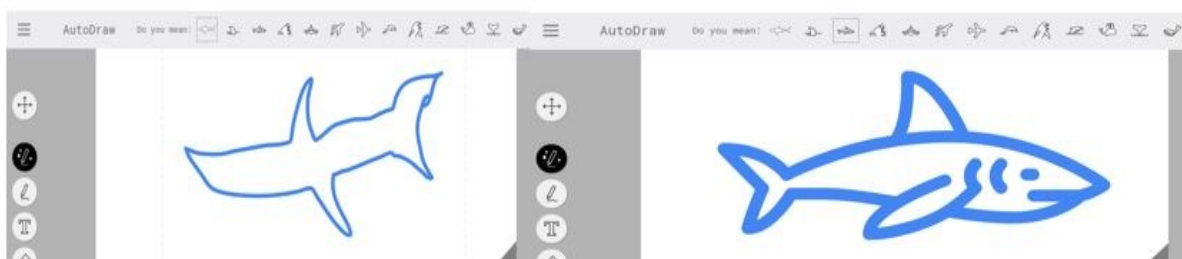


Fig. 7. AutoDraw’s suggestion tool. For Web designers, we also recommend Comic Strips (makebeliefscomix.com) for creating comics, and GIF Animator ([toolson.Net/Gif Animation/Create](http://toolson.Net/GifAnimation/Create)) for generating animation from a set of static images.

J. Publisher

Adobe InDesign and QuarkXPress have dominated the desktop publishing market. However, Microsoft Publisher is more suitable for entry-level users. Unlike Microsoft Word, Microsoft Publisher emphasizes on page layout and design, rather than composition and proofreading. Microsoft Publisher comes in handy for creating business cards, greeting cards, calendars, newsletters, labels, fliers, banners, posters, invitations, announcements, certificates, planners and envelopes. Another recommendation is LucidPress (lucidpress.com), which is a free, online tool (see Figure 8).

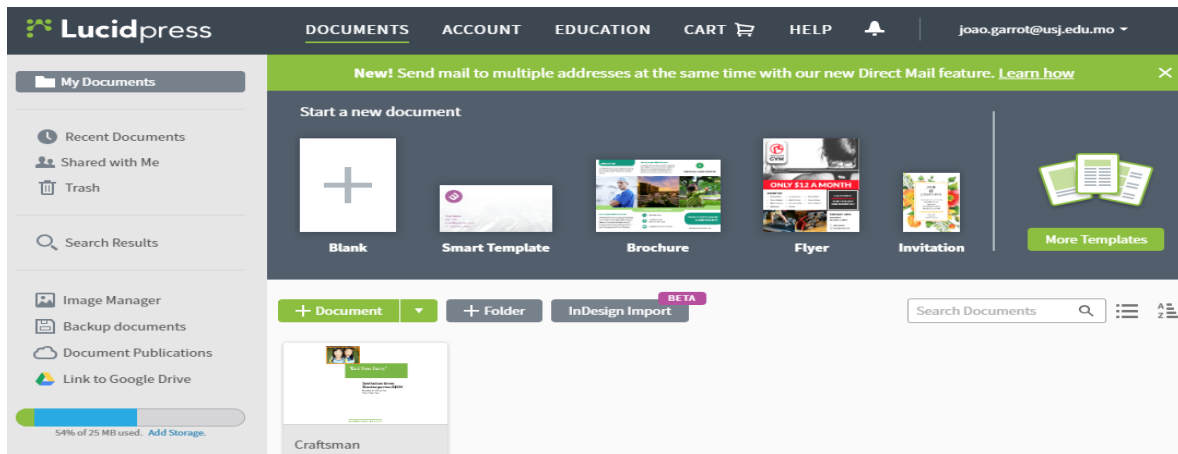


Fig. 8. LucidPress.

K. Learning Management Systems

Emerged from e-learning, an LMS is a software for administration, documentation, tracking, reporting and delivery of educational courses or training programs [21]. Figure 9 illustrates the elements of an LMS. Historically, LMS acted as a platform for online courses, blended learning and flipped classrooms. Therefore, LMS serves as an essential link between educators and learners. Schoology (schoology.com), Moodle (moodle.org) and Google Classroom (classroom.google.com) are the three free web-based platforms that educators, especially those at secondary and university levels, should master.



Fig. 9. Elements of LMS (www.edubilla.com/articles/online-degree-programs/learning-management-system).

L. WebQuest

WebQuest (zunal.com) is an inquiry-oriented lesson format developed by San Diego State University in 1995. In a WebQuest, a teacher pre-selects sources mostly from the Web, and encourages students to use rather than to gather information. WebQuest focuses on higher-order thinking skills (such as analysis, creativity and criticism),

and is usually consisted of six parts: introduction, tasks, process, resources, evaluation and conclusion [22] (see Figure 10). Teachers can use WebQuest to teach descriptive and memorization-based topics effectively.

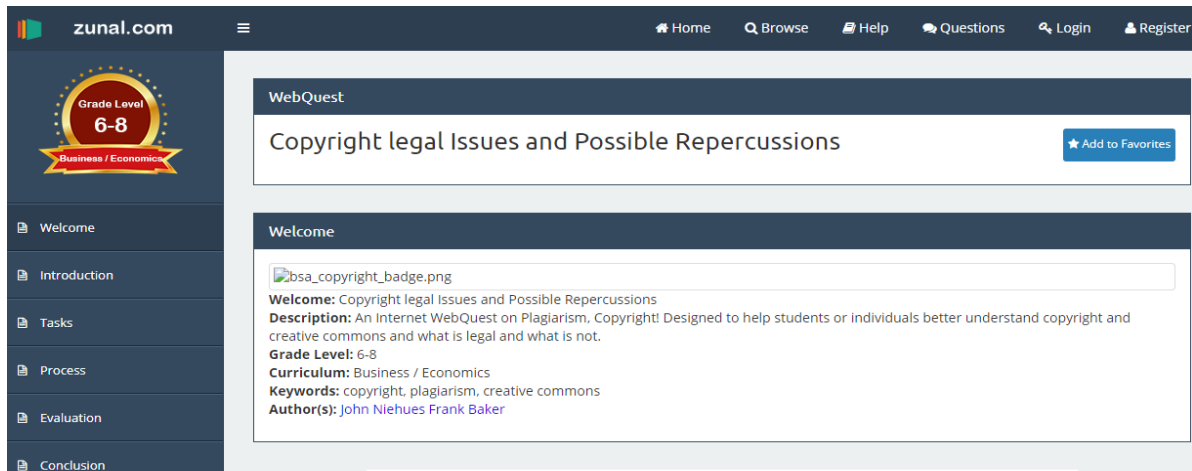


Fig. 10. A WebQuest example. Some of the good examples are analysis of a famous biography, the periodic table, idiomatic expressions, computer history, the Great Depression, ancient Egyptian civilization, use of robots in society, facts about the Milky Way, and Gardner’s Multiple Intelligences.

M. Internet Connection and File Conversion

It is always a good idea to test the Internet connection in a classroom to ensure speedy upload and download. Speedtest.net is helpful for this purpose. As for file conversion, a handy tool is Zamzar (zamzar.com) Zamzar has over 1,000 types of file conversions, and supports numerous image formats, document formats, audio formats, video formats, e-book formats, compressed formats and CAD formats (see Figure 11).

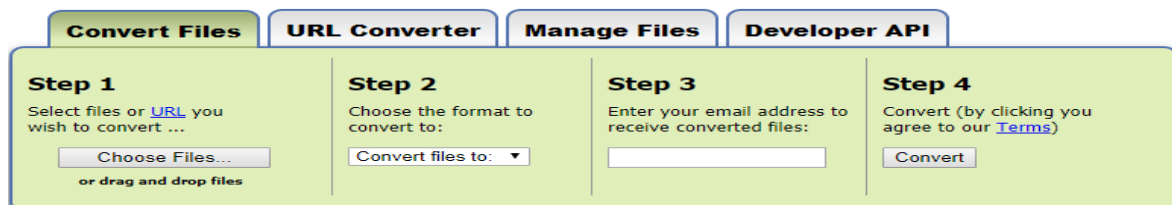


Fig. 11. File conversion by Zamzar.

N. Sharing Ideas

TED Talk (ted.com) has become popular among those who enjoy listening to, learning from, reflecting on and contemplating new ideas introduced by speakers from different scientific, cultural and academic backgrounds [23]. Similarly, a teacher can initiate a debate (on private blogs, wikis or forums, for example), give an introduction in class and ask each student to give an 18-minute “TED talk” in an innovative and interesting way.

Google Alerts (google.com/alerts) is a content change detection and notification service that sends emails to the user when it finds new results (web pages, newspaper articles, blogs or scientific research) that match the user’s search keywords. Indeed, this tool is a great time-saver for any teacher (and not only) that is looking for the latest updates on a specific matter.

O. Online Questionnaires

Teachers can device a live competition and get feedback from students in class through online questionnaires. At Kahoot.com, a teacher can quickly and easily create a fun learning game based on a series of multiple-choice

questions [24]. The teacher can draw students’ attention by adding videos, images and diagrams into each question. From our experience, the best set-up is to project a game on a screen, and have students answer the questions on their smart phones. By looking at the same screen, students have a “campfire moment,” during which they encourage each other, celebrate a correct answer together and strengthen their bond.

Quizlet.com is an alternative to traditional glossary, through which users can create digital flashcards and matching games. Using this Web 2.0 tool, teachers can set up a quiz show game in class. For subjects that require understanding of many definitions and related concepts, like Physics, Biology and Geology, Quizlet is particularly useful.

Figure 12 illustrates another fun classroom activity - jeopardylabs.com. Teachers can create a Jeopardy game by customizing the questions and assigning points to each question based on its difficulty level. When playing it in class, students/teams can simply voice out their answers.

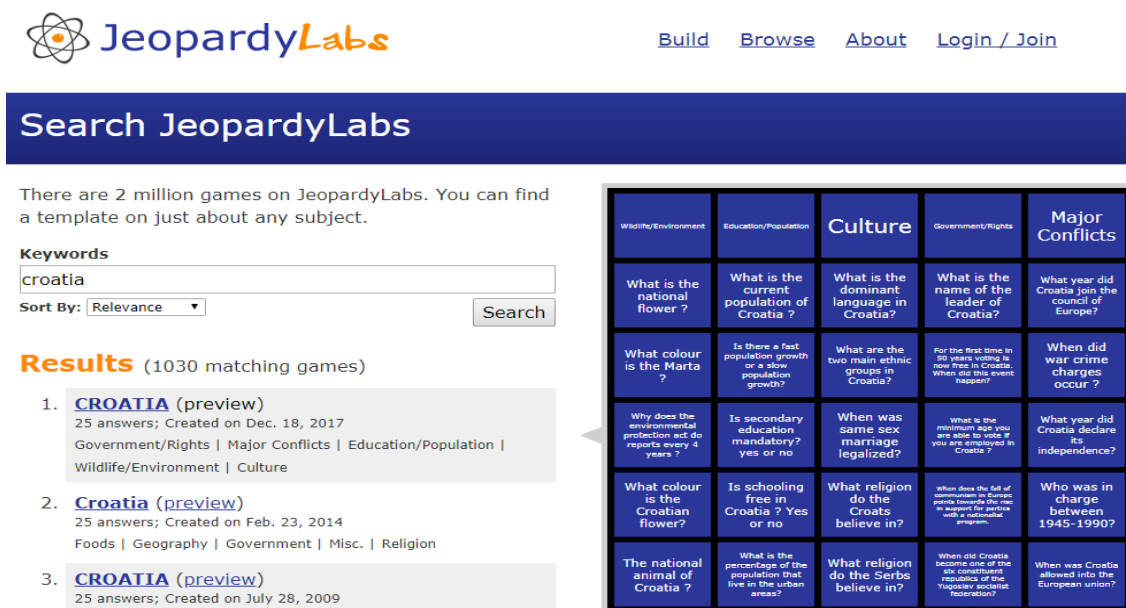


Fig. 12. JeopardyLabs.

P. Gamification

According to [25], by the time a person turns 21, s/he has played 10,000 hours of video games, and the same amount of time s/he has spent in school. The good news to teachers, nevertheless, is that it is possible to use games for teaching. Teachers can gamify learning by applying game principles in non-game situations. Naturally, the aesthetics of games is appealing to learners, and learners quickly understand and respect their mechanics and rules. This teaching strategy is effective because when students play the games voluntarily, they tend to remember, and be able to understand the concepts and analyze the problems [26]. Gamified teaching can easily captivate students for hours. For reference, some teachers play songs to teach a language and use real toys (e.g. those from rainbowresource.com) to teach phonics, handwriting, logic, music and crafts to kindergarten and primary students (education.com/ games and learninggamesforkids.com offer a variety of learning games).

Q. Scratch

Like EToys, Scratch (scratch.mit.edu) is a programming language widely used to teach children coding and computational thinking (for knowledgeable programmers, we recommend unity3d.com). Little programmers can

compose scripts from pre-packaged tiles to animate graphical objects. Scratch is available in 70 languages, and many students use it to create games. When provided visuals, students can learn Physics, Music, Arabic and Psychology through Scratch [27] (see Figure 13). For example, teachers can create animation that helps students visualize a water cycle.



Fig. 13. Scratch development environment. To teach topics of history, such as the era of dinosaurs and the city of Athens in ancient Greece, teachers can take advantage of virtual reality (VR) in smart phones (apps can be downloaded from play.google.com/store/apps or www.apple.com/ios/app-store). On the other hand, teachers can demonstrate objects like submarines, planes, robots, vehicles, etc. through 3D modeling at sketchfab.com and giving students a view in VR glasses.

III. CONCLUSION

Our society has a culture that prioritizes exams and grades over the learning experience itself. At present, students study hard with the goal of obtaining high grades in school exams, national exams, SAT, GMAT, TOEFL, GRE, ISAT, IELTS, PISA, ETS, etc. With a good grade, a student can enter a prestigious university, pursue a desirable degree, and finally get a decent job in the market [6]. In this way, a student meets society's expectations. The driving forces behind such fierce competition are rankings, standardization and recognitions. However, in spite of their value in society, these aspects do not define successful education. As students lose interests in learning, teachers struggle and dropout rate rises [28]. Worse still, the resilient students remain, but their joy in learning slowly vanishes.

Education is more than schooling, so learning should not be confined to classrooms. Blended learning approaches can reshape today's knowledge economies and open societies. Many claim that the current secondary school system "duck feed" their students [29]. Some suggest to retain only the fundamental courses (Mathematics, languages, Physical Education, Technology, etc.) and make other courses (Geography, Physics, Chemistry, History, Music, Philosophy, Drawing, etc.) optional. As students choose among optional courses according to their preferences, parents and psychologists can help them delineate their professional career goals. There are benefits to both the schools and the labor market. Schools can maintain the quality of education with less resources. At the same time, the labor market welcomes more specialized talents.

Globally, this writing highlights how informal learning, especially through advanced technologies, can reinforce the knowledge learned formally because blended approaches can train learners to better cope with the diverse environment in this digital era. It is urgent that policy makers develop a framework that can accommodate both formal and informal learning.

In particular, this paper recommends Web 2.0 tools that can ease teachers' task to adapt to a mix of formal and informal learning. As shown in the previous section, several Internet tools can be found for free that may help any

educator, regardless the content to be presented, as long as there is an alignment between that content to be transmitted to the students and the class plan. For instance, the use of virtual reality may enhance the quality teaching in a Greek History class. As well, scratch quiz games or JeopardyLabs may improve the knowledge testing phase in a more funny way. Learning management systems and DropBox allow the sharing of resources and activities between the professor and the apprentice. WebQuest classes are an alternative way of the traditional lecturing to deliver highly theoretical lessons while TedTalk can fire a discussion on any topic of science or religion among pupils. Monkey Survey and Google Forms should be used to get students or parent's feedback on any scholar issue whereas MindMaps are extremely useful to understand, in a graphical mode, the overall framework of a specific subject before the instructor goes into details. Still and again, it is up to the teacher to be aware of these Web 2.0 tools and make an alignment between the chosen tool and the content to be delivered.

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