

A Typology of Web 2.0 Learning Technologies

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Abstract

This article presents the outcomes of a typological analysis of Web 2.0 learning technologies. A comprehensive review incorporating over two thousand links led to identification of 212 Web 2.0 technologies that were suitable for learning and teaching purposes. The typological analysis then resulted in 37 types of Web 2.0 technologies that were arranged into 14 clusters. The types of Web 2.0 learning technologies, their descriptions, pedagogical uses and example tools for each category are described, arranged according to the clusters. Results of this study imply that educators typically have a narrow conception of Web 2.0 technologies, and that there is a wide array of Web 2.0 tools as yet to be fully harnessed by learning designers and educational researchers.

Introduction

Web 2.0 technologies offer substantial opportunities for educators to enhance communication, productivity and sharing within their classes (Brown, 2010; Greenhow, Robelia, & Hughes, 2009). In order to capitalize on Web 2.0 technologies educators need to first understand the sorts of Web 2.0 technologies that are available and their various features (Redecker, Ala-Mutka, Bacigalupo, Ferrari, & Punie, 2009). Typologies of Web 2.0 technologies have been previously suggested (Boulos, Maramba, & Wheeler, 2006; Crook, 2008; Franklin & Van Harmelen, 2007). While many of these typologies included valuable and sensible categories of Web 2.0 technologies, none of them appear to result from any sort of systematic analysis or review.

The current study used structured typological analysis techniques to derive a typology of Web 2.0 learning technologies. Over two thousand links were reviewed from online archive sites, educational technology texts, online searches and previous Web 2.0 review papers. This led to identification of 212 current Web 2.0 technologies that are suitable for learning and teaching purposes. The typological analysis then resulted in 37 types of Web 2.0 technologies that were arranged into 14 clusters. A schematic representation of the resulting typology of Web 2.0 learning technologies is shown in Figure 1.



Figure 1. Typology of Web 2.0 learning technologies

The types of Web 2.0 learning technologies, their descriptions, pedagogical uses and example tools for each category are described below, arranged according to the clusters. Throughout the descriptions the term ‘users’ rather than ‘teachers’ is often applied because students may learn more from being designers with the technology than from teachers preparing and disseminating activities, and ‘users’ encapsulates both of these cohorts. The typological analysis used to derive the typology of Web 2.0 learning technologies is being submitted for peer-reviewed publication, and is available on request.

The Web 2.0 Learning Technologies Typology

Text based tools

Synchronous text discussion

Synchronous text discussion tools enable users to exchange text-based comments in real-time. These can be used for synchronous interaction between groups of learners to form a backchannel during a live presentation, or for instance to facilitate remote troubleshooting support. Twitter (<http://twitter.com>) is the most well known of these tools providing the ability to post short public text comments, and Plurk

(<http://plurk.com>) provides an alternative. Chatzy (<http://chatzy.com>) and Today's Meet (<http://todaysmeet.com>) enable users to create private web-based chat streams that can be shared via URL.

Discussion forums

Discussion forums facilitate asynchronous text discussions between groups of users, organising contributions according to discussion threads. This can be useful for more reflective text conversations where real-time interaction is not required. Examples include Forums.com (<http://forums.com>) or ProBoards (<http://proboards.com>). ReadUps (<http://readups.com>) is a social reading platform where people can read a book together by placing text based comments around the pages within the browser (which can also be used in synchronous mode by virtue of the inbuilt Twitter integration). Tackk (<http://tackk.com>) allows multimedia elements such as images, audio and video to be woven into the discussion.

Note-taking and document creation

Note-taking and document creation tools enable groups of users to collaboratively author documents in real-time and see each other's changes. Etherpad (<http://etherpad.org>) has basic formatting options, version tracking, colour-coded author contributions and a separate text-chat area. Evernote (<http://evernote.com>) provides a more sophisticated web interface for note-taking including image insertion and file management but with view-only sharing rather than collaborative writing capabilities. Google Docs (<http://docs.google.com>) enables simultaneous contributions to a document by multiple users with many of the features of Microsoft Word (including the ability to embed images). Zoho Writer (<http://zoho.com/docs>) is an alternative to Google Docs.

Image based tools

Image sharing

Image sharing sites are designed to facilitate asynchronous public sharing of images. Users can utilize these to source and share image resources. Flickr (<http://flickr.com>) provides a large repository of publically shared photos (and more recently, videos) that people can use or share subject to the Creative Commons Licenses specified by the creators. Instagram (<http://instagram.com>) also facilitates photo (and video) sharing through individual postings. Other sites support sharing of images via open repository, for instance Pics4Learning (<http://www.pics4learning.com>) provide archives of pictures that can be used for education, Openclipart (<http://openclipart.org>) offers general purpose clip-art, and Wikimedia Commons (<http://commons.wikimedia.org>) incorporates images (and videos) that can be reused under Creative Commons licenses.

Image creation and editing

Image creation and editing sites enable users to individually create and edit images that can then be shared via URL. This can be useful when users need to produce and disseminate an image, for instance to represent a concept. Befunky (<http://befunky.com>), PicJuice (<http://picjuice.com>), and DrPic (<http://drpic.com>) provide simple online photo editing tools with cropping, resizing, colour mixing,

exposure and sharpening adjustments as well as filters. Pho.to (<http://pho.to>) specialises in photo effects and incorporates the ability to make collages. Pixlr (<http://pixlr.com>), Sumopaint (<http://sumopaint.com>) and DeviantArt (<http://muro.deviantart.com>) provide more powerful image creation and editing facilities with layers and effects much like proprietary commercial software, yet available directly through a web browser.

Drawing

Drawing tools allow users to use their mouse as a pen to create a picture and share it via a URL. This can be useful for sketching and illustrating purposes. ArtPad (<http://artpad.art.com/artpad/painter/>) simulates a canvas and paintbrushes through a simple to use interface. Slimber (<http://slimber.com>) enables individual users to replay their creation at speed to see how the image was constructed. Flockdraw (<http://flockdraw.com>) enables multiple users to enter a free-form collaborative drawing session through their browser with integrated text chat.

Online whiteboarding

Online whiteboarding tools differ from drawing tools in so far as they include line, shape and text tools (and in some cases other features) to structure the illustrative process. A Web Whiteboard (<http://awwapp.com>) provides a simple whiteboard for real-time collaborative whiteboarding. Google Drawing (<http://docs.google.com/drawing>) and Board800 (<http://board800.com>) provide more fully featured whiteboarding with live collaboration but no still no inbuilt communication channels. CoSketch (<http://cosketch.com>), Draw It Live (<http://drawitlive.com>) and Dweeber (<http://dweeber.com>) incorporate text-chat to support live collaboration. Sketchlot (<http://sketchlot.com>) incorporates features specifically designed for education, for instance enabling teachers to share drawings with their students and then have students mark them up and send them back to the teacher. Stoodle (<http://stoodle.ck12.org>) includes audio chat facilities with their whiteboarding tools. Twidlla (<http://twidlla.com>) includes a suite of tools for collaborative whiteboarding, marking up documents, websites, collaborative writing and discussions via text or audio. Pixiclip (<http://pixiclip.com>) does not enable collaborative whiteboarding but it does allow recording of contributions along with audio and webcam based annotations for later playback.

Diagramming

Diagramming tools impose more structure to the drawing process by offering a range of templates for creating diagrams and flowcharts. This can be useful if users need to quickly develop a procedural schematic diagram. Examples include, Gliffy (<http://gliffy.com>), Lucidchart (<http://lucidchart.com>), Draw.io (<http://draw.io>) and Cacao (<http://cacao.com>). Creately (<http://creately.com>) enables collaborative diagram creation, including flowcharts.

Mindmapping

Mindmapping tools support the development of images to represent interrelated concepts in the form of a visual knowledge network that can be shared via URL. This can be used to represent conceptual and even metacognitive understanding. Bubblus (<http://bubbl.us>) and Mindomo (<http://mindomo.com>) provide simple text

based mindmapping with the ability to save and disseminate maps via URL. Mindmup (<http://mindmup.com>) and Wisemapping (<http://wisemapping.com>) provide a large range of editing and formatting features including the ability to embed images. Popplet (<http://popplet.com>) allows images, text and freestyle drawing to be organized and linked. For collaborative mindmapping, Mind42 (<http://mind42.com>), Mindmeister (<http://mindmeister.com>) and Slatebox (<http://slatebox.com>) have advanced formatting capabilities, image insertion, and also allow real-time collaborative authoring. Coggle (<http://coggle.it>) provides real-time collaborative authoring and the ability to track back through versions of the mindmap to see who has made changes at various points in time. Text2Mindmap (<http://text2mindmap.com>) provides the ability to automatically convert indented text directly into a mindmap. Debategraph (<http://debategraph.org>) provides groups of users with the ability to visualise a network of documented ideas with features to view the knowledge networks in different ways including as trees, radial graphs, nested and content boxes.

Mapping

Mapping tools support the creation of custom maps by marking up publicly available mapping information, which can then be shared by link or by embedding within another site. This can be useful for representing a travel path or a series of related sites. Google Maps (<http://maps.google.com>) allows users to pin text, images, and videos to maps that can then be shared by URL. Quickmaps (<http://quikmaps.com>) allows simple text and drawing markup of Google maps. Scribblemaps (<http://scribblemaps.com>) allows image, text and marker placement on Google maps. Woices (<http://woices.com>) and Umapper (<http://umapper.com>) allow audio annotations to be added to maps.

Word clouds

Word cloud tools enable users to create and share image arrangements of keywords of a text based on the file, text or URL provided by users. This offers educators a visually appealing way to represent a literary composition and also enables lightweight analysis based on the words that are more frequent and thus occur in larger text. Examples include Wordle (<http://wordle.net>), Taxedo (<http://tagxedo.com>) and Tagul (<http://tagul.com>).

Audio tools

Audio sharing

Audio sharing sites enable users to upload and share their audio recordings (for instance, podcasts) via open repositories. This can be useful for sourcing disciplinary information and also sounds to be used for remixing. Examples include Soundcloud (<http://soundcloud.com>), Audioboom (<http://audioboom.com>), Freesound (<http://freesound.org>), and Chirbit (<http://chirbit.com>) and SoundBible (<http://soundbible.com>).

Audio creation and editing

Audio creation and editing sites enable individuals to record audio directly through their browser. Vocaroo (<http://vocaroo.com>) allows simple online audio recording

directly through a web-browser. Voxopop (<http://voxopop.com>) provides a voice based discussion forum, which is particularly useful for language classes. Soundation (<http://soundation.com>) offers users more sophisticated audio recording and editing functionality including the ability to mix different audio tracks and combine them with a library of free sound effects.

Video tools

Video sharing

Video sharing sites enable users to share video content via public repositories. This enables teachers and students to source video content for knowledge acquisition or remixing purposes, as well as disseminate their own video. YouTube (<http://youtube.com>) and Vimeo (<http://vimeo.com>) are well known generalist video sharing sites. Teachertube (<http://teachertube.com>) specializes in the sharing of educational videos.

Video creation and editing

Video editing tools allow individual users to create and edit videos through their browser. This enables teachers and students to create video content for instructional or assessment purposes. The YouTube Video Editor (<http://youtube.com/editor>) can combine videos, trim, add images, audio tracks, transitions and text, and includes feature to adjust brightness, contrast and so on. Other tools in this space, each with their various features include Video Toolbox (<http://videotoolbox.com>), FileLab Video Editor (<http://filelab.com/video-editor>), and Mozilla PopcornMaker (<http://popcorn.webmaker.org>). Kizoa (<http://kizoa.com>) and Muvee (<http://muvee.com>) specialise in videos and slideshows based on images, multimedia, text, and music, incorporating transitions and a range of other effects. Screencast-o-matic (<http://screencast-o-matic.com>) provides users with the ability to create a video recording of their screen via direct operation through their browser.

Video streaming

Video streaming services allow users to publicly broadcast a live video stream from their video camera or webcam. This is useful for providing remote access to live events (such as presentations) or creating a student-driven television broadcast. Google Hangouts On Air (<https://plus.google.com/hangouts/onair>) provides a free video streaming service integrated into the Google Plus suite. Other alternatives include Ustream (<http://ustream.com.tv>), LiveStream (<http://livestream.com>), Veetle (<http://veetle.com>), Vokle (<http://vokle.com>) and YouNow (<http://younow.com>), most of which use advertising to support their free plans.

Multimodal production tools

Digital pinboards

Digital pinboards allow groups of users to organise and share a range of resources such as web pages, files, photos, and notes by adding them to a freeform canvas. This is useful for collaborative brainstorming sessions. Examples include Pearltrees (<http://pearltrees.com>), Paddlet (<http://padlet.com>), Lino (<http://en.linoit.com>)

Magnoto (<http://magnoto.com>), Stormboard (<http://stormboard.com>) and Groupman (<http://groupman.com>).

Presentations

Presentation tools enable users to sequence multimodal content so as to support or deliver an instructional narrative. Products are shareable via URL and public repositories. Presentation tools are useful for any situation where teachers or students are required to share or demonstrate their understanding. Prezi (<http://prezi.com>) provides users with an open and zoomable canvas for embedding video, images and text, and supports recording, real-time collaboration, and sharing via a public repository of presentations. Google Slides (<http://www.google.com/slides/about>) supports real-time collaborative authoring of PowerPoint style slides directly through the browser, with presentation and sharing via a URL. Haikudeck (<http://haikudeck.com>) provides simple web-based slide creation software that searches for appealing image backgrounds based on keywords. Photopeach (<http://photopeach.com>) and Photosnack (<http://photosnack.com>) enable the creation of slideshows based on image upload (though without audio annotation). Vcasmo (<http://vcasmo.com>) specialises in adding audio-visual narration to slide presentations. Slideshare (<http://slideshare.net>) and Authorstream (<http://authorstream.com>) enable users to share their desktop presentations via public repository, and include the ability to add audio narration to uploaded slides.

Lesson authoring

A range of Web 2.0 lesson authoring tools have emerged that enable users to sequence content into learning modules and often add interactive elements. These can be used by teachers to create learning sequences, and also by students in tasks that require them to teach their peers. Example tools include LAMS (<http://lessonlams.org>), BlendSpace (<http://blendspace.com>), SoftChalk (<http://softchalk.com>), EasyGenerator (<http://easygenerator.com>), Nearpod (<http://nearpod.com>) and Udutu (<http://udutu.com>). Compisica (<http://compisica.com>) has been designed to support collaborative authoring via the web. Many of these tools have a free trial period before charging for services. Zaption (<http://zaption.com>) and Edpuzzle (<http://edpuzzle.com>) provide users with the ability to synchronise images, text, and interactive quiz elements to Youtube and other video clips.

Digital storytelling tools

Online book creation

Online book creation sites enable individual users to create a story based on pictures and text, and share them via URL or repository. These can allow adults to publish and distribute their work in book form, and there are also a range of tools that support story composition by younger students. StoryJumper (<http://www.storyjumper.com>) and Tikatok (<http://tikatok.com>) allow students to create and publish e-books by uploading their images and text. StoryBird (<http://storybird.com>) provides a wide variety of artistic theme-based templates and graphics to enhance and structure story creation. MyStoryMaker

(<http://carnegielibrary.org/kids/storymaker>) helps younger students to plan and create their cartoon storybook by providing a narrator who guides students through the storytelling decisions that need to be made. Mixbook (<http://mixbook.com>) is a well-renown site for creating books based on uploaded photos than enables collaborative authoring and sharing (including in print form).

Comic strip creation

Comic strip creation sites allow users to drag and drop characters and backgrounds into templates and then overlaying individualized images and text. Comics are often used as elementary yet motivating ways to summarise scenarios or demonstrate processes. Examples include Storyboard That (<http://storyboardthat.com>), Toondoo (<http://toondoo.com>), MakebeliefsComix (<http://makebeliefscomix.com>), BitStrips (<http://bitstrips.com>), and Pixton (<http://pixton.com>). WittyComics (<http://wittycomics.com>) provides an adult genre for their comics.

Animated videos

Animated video sites enable creation and sharing of animated videos and presentations through drag-and-drop interfaces with a large variety of elements, styles and templates. This is useful for creating videos without the need to shoot footage. Examples include Powtoons (<http://powtoon.com>), Moovly (<http://moovly.com>), DigitalFilms (<http://digitalfilms.com>) and Dvolver (<http://dvolver.com>).

Website creation tools

Individual website creation

Individual website creation tools enable single users to create websites from customisable templates through a point-and-click interface (no coding required). Examples include Google Sites (<http://sites.google.com>), Tripod (<http://tripod.lycos.com>), Wix (<http://wix.com>), Jimdo (<http://jimdo.com>), and Moonfruit (<http://moonfruit.com>). Note that many of these have basic free plans with fees for premium services. Weebly (<http://weebly.com>) also integrates a blog tool. For single page websites Glogster (<http://glogster.com>) provides a simple to use interface for creating visually appealing posters that can be made available as a URL.

Wikis

Wikis enable multiple users to create, edit and link multi-page websites through their web-browser. Teachers and students can use this to create collaborative knowledge bases and for project workspaces. Wikispaces (<http://wikispaces.com>) is a popular wiki tool for education and has recently introduced new tools for managing classes. PBworks (<http://pbworks.com>) is another frequently used wiki that is free for education. Recently there has been a decline in the number of freely available served wikis, though Wikia (<http://wikia.com>) and WikiFoundry (<http://create.wikifoundry.com>) provide alternatives. Central Desktop (<http://centraldesktop.com>), MindTouch (<http://mindtouch.com>), Confluence (<https://www.atlassian.com/software/confluence>) and SocialText

(<http://socialtext.com>) are other options but their more commercial orientation means that they only have limited free trials.

Blogs

Blogs differ from wikis in that they organise website posts in chronological order. This makes making the suitable for teachers and students to represent and track evolving thinking over time. Wordpress (<http://wordpress.org>) includes multimedia libraries, numerous templates and a host of widgets to enhance the functionality of their blogs. Edublogs (<http://edublogs.org>) is based upon the Wordpress platform and offers teachers the capacity to create and administer an entire class of blogs through a secure portal. Kidblog (<http://kidblog.org>) also offers the ability to create class sets of blogs. Tumblr (<http://tumblr.com>) has become a popular blogging platform by virtue of its easy to use interface and simple resharing facilities. Blogger (<http://blogger.com>) is another well known blogging site now owned by Google. Paper.li (<http://paper.li>) and RebelMouse (<https://rebelmouse.com>) provide online newsletter publishing tools with a commercial agenda but do allow free use for individuals. Penzu (<http://penzu.com>) allows students to create private notebook entries and embed images, with a range of classroom management, tracking and assessment tools for teachers.

Knowledge organization and sharing tools

File sharing

File sharing sites enable users to share their documents, images, audio files and videos via the web. Whereas other types of tools enable users to view and often manipulate those files, file sharing sites typically only provide a directory or 'folder' system where permissions can be set to determine who can access the files. This is useful for sharing files within classes and between groups. Popular examples include Dropbox (<http://dropbox.com>), MediaFire (<http://mediafire.com>), 4shared (<http://4shared.com>), and OneDrive (<http://onedrive.live.com>). Google Drive (<http://google.com/drive>) differentiates itself by integrating its online office tools (Docs, Sheets, Slides, Forms and Drawings) with file storage so that users can view and edit files through their browser.

Social bookmarking

Social bookmarking sites enable users the capacity to store, organise, annotate, and share links to websites online. This is useful for creating sets of links amongst a community of practice or team. Examples include Delicious (<http://delicious.com>) and Diigo (<http://diigo.com>), with the latter allowing users to create groups and online presentations. Other emerging social bookmarking tools include Icyte (<http://icyte.com>), Memonic (<http://memonic.com>) and Webnotes (<http://webnotes.net>), each with their slightly different features and target audiences. Educlipper (<http://educlipper.net>) is specifically designed to help share collections of resources for educational purposes and create learning and teaching networks for educators and students.

Aggregators

Aggregators use Really Simple Syndication (RSS) harvest web-based information into one place. This allows users to organise, save and share content on topics that is important to them. Examples include Flipboard (<http://flipboard.com>) and Feedly (<http://feedly.com>). Bloglines (<http://www.bloglines.com>) specializes in aggregation of blog content.

Republishing

Republishing tools extend beyond aggregation tools to enable individuals and groups of users to not only scrape content from the web but also comment upon and republish it. This can be used by students and teachers to share interpretations of the resources that they find. ScoopIt (<http://scoop.it>) is designed for individual user republishing, while Storify (<http://storify.com>) supports collaborative authoring and reposting. Pinterest (<http://pinterest.com>) enables groups of users to collect, markup and republish content around a common topic of interest. LiveBinders (<http://livebinders.com>) allows users to collect links and organise content into virtual shareable folders about topics.

Data analysis tools

Conducting surveys

Online survey tools that enable collection of data via web forms. This enables students and teachers to source data to use in subsequent analysis. Examples include Survey Monkey (<http://surveymonkey.com>), Polldaddy (<http://polldaddy.com>), SurveyGizmo (<http://surveygizmo.com>), FluidSurveys (<http://fluidsurveys.com>), Insightify (<http://insightify.com>) and Ballet-Box (<http://ballot-box.net>). Google Forms (<http://www.google.com/forms/about>) provides the capacity for multiple users to collaboratively author surveys, with integration into the Google spreadsheet application for data analysis. Poll Everywhere (<http://polleverywhere.com>) differentiates itself from other survey tools by offering SMS as well as web-based voting and real-time broadcasting of responses as controlled by the teacher.

Online spreadsheets

Online spreadsheets provide the ability for users to collaboratively edit spreadsheets that are shared via a URL. This means teachers and students can conduct collaborative data analysis. Google Sheets (<http://www.google.com/sheets/about>) is the most popular online spreadsheet. Alternatives include Zoho's Spreadsheet tool (<http://www.zoho.com/docs>), Live Documents spreadsheet (http://www.live-documents.com/live_spreadsheets.html) and Ethercalc (<http://ethercalc.net>). Smartsheet (<http://smartsheet.com>) is an online spreadsheet with extra organizational features such as additional views as calendars and Gantt charts.

Infographics

Infographics provide online tools and templates for representing numerical data that can in turn be shared via URL. Infogram (<http://infogr.am>) provides the ability to import Excel or CSV files to create different types of charts that can be published online. iCharts (<http://icharts.net>) allows Google Drive data to be loaded, and

integrates interactive chart features. Easelly (<http://www.easel.ly>) and Piktochart (<http://piktochart.com>) moves beyond chart data to create poster-style template-based data representations.

Timeline tools

Timeline tools allow users to organise text and images on a single page according to when they occurred. This is useful for representing historical events. Timetoast (<http://timetoast.com>) and Timeglider (<http://timeglider.com>) are basic examples. Dipty (<http://dipity.com>) also includes a zooming facility. Tiki-Toki (<http://tiki-toki.com>) allows users to make timelines in three dimensions so that different themes can be seen along side one another. Capzles (<http://capzles.com>) has more of a multimedia emphasis, enabling video, images, blog posts and files to be arranged within their interface. OurStory (<http://ourstory.com>) incorporates the ability to collaboratively create timelines and is designed to include more extended blog-like posts.

3D modeling tools

3D modeling tools enable users to create three-dimensional Computer Aided Design (CAD) models through their web-browser. These tools support the rising maker movement by enabling 3D objects to be designed, stored and shared in the cloud, and then exported for 3D printing. Shapeshifter (<http://shapeshifter.io>) enables quick creation and manipulation of 3D objects that can be downloaded for printing and shared by hyperlink. Tinkercad (<http://tinkercad.com>) provides browser based CAD design, which supports import (for instance from open 3D repositories such as Thingiverse) and has socially formed gallery of creations.

Assessment tools

Assessment tools typically enable users to create online quizzes using a range of question types (such as allows users to create multiple choice, fill in the blank, matching, short answer, and true/false questions) with automatic grading and feedback as well as performance tracking. Epitomic examples include Quizstar (<http://quizstar.4teachers.org>) and ProProfs Quizmaker (<http://proprofs.com/quiz-school>). Quizlet (<http://quizlet.com>), Cram (<http://cram.com>) and CoboCards (<http://cobocards.com>) also allow creation of flashcards and various forms of testing (for instance multiple choice, true false, matching, written answer) as well as memorization tasks and games, with a public repository of user creations. EasyTestMaker (<http://easytestmaker.com>) and Fifty Sneakers (<http://fiftysneakers.com>) are more print and summative assessment oriented, but with sophisticated features for tracking student performance. Quia (<http://quia.com>) is another online system for creating and sharing quizzes as well as other educational activities including games, though with only a 30-day free trial. Socrative (<http://socrative.com>) is specifically designed for real-time monitoring of quiz results for formative assessment purposes.

Social networking systems

Social networking systems enable users to sharing photos and videos, post text-thoughts and run polls via their personalized profile pages. They can be used to help students share content, provide feedback and trouble-shooting support to one another, and harvest perceptions via comments and voting activities. Facebook (<http://facebook.com>) is obviously the most well-renown social networking site. Google plus (<http://plus.google.com>) has grown in use due to integration with Gmail and other Google tools. Edmodo (<http://edmodo.com>) is a popular alternative amongst educators because it only provides access to the class of registered students and includes features to support educative practices (such as assignment dropboxes). Twiducate (<http://twiducate.com>) and Fakebook (<http://www.classtools.net/FB/home-page>) provide other educational alternatives. There are other social networking tools that are built around specific communities of practice. For instance, Research Gate (<http://researchgate.net>) and Academia (<http://academia.edu>) support social networking and information sharing for academics.

Synchronous collaboration tools

Synchronous collaboration tools enable groups of users to synchronously share text chat as well as audio-video webcam or screen-share content via their browser. This makes them suitable for running online classes or distributed team-work. Zoom (<http://zoom.us>) allow basic web conferencing for 25 participants for up to 40 minutes and comes with screen sharing, text chat and recording all directly through a browser. Google Hangouts (<http://plus.google.com/hangouts>) offers web-based video-conferencing for up to 10 people as part of the Google+ suite. GoToMeeting (<http://gotomeeting.com>), WizIQ (<http://wiziq.com>) and Speek (<http://speek.com>) offer video conferencing alternatives but for only a handful of participants. Vyew (<http://vyew.com>) and Fuze Meeting (<http://fuzemeeting.com>) offer alternatives for larger numbers of participants, but only come with a 30 day free trial.

Concluding comments

The typology of Web 2.0 learning technologies presented in this article was based upon a systematic review of Web 2.0 tools and typological analysis of their affordances. It is by no means claimed that all Web 2.0 technologies have been incorporated, however, many of the Web 2.0 technologies available to educators have been included and logically delineated into a typological system. This provides educators with a framework for conceptualizing the Web 2.0 landscape and a valuable timestamp of current Web 2.0 tools. The identification of individual Web 2.0 technologies also helps teachers select technologies that match their learning and teaching requirements.

It appears from the literature that only a narrow subset of tools is being utilized and investigated by educators and educational researchers. Thus there is considerable potential to investigate how the various affordances of different Web 2.0 tools with their different modalities and structures can be incorporated into learning designs

and impact upon learning processes. The typology presented herein offers a touchstone for educators and researchers, by raising awareness of the large variety of technologies available and how they can be distinguished in terms of modalities, synchronicity, structure of information, and sharing.

There is no doubt in the future that Web 2.0 technologies will change. In some cases this may mean stabilization of a category to one dominant technology, or in other cases an innovation that germinates a new category of tools. However, a persistent theme underpinning learning technology development and usage will be an analysis of how modalities of representation and communication are structured in order to facilitate learning processes. To this extent the current analysis provides a typological overview of current Web 2.0 learning technologies differentiated and described along relevant dimensions, to provide educators with a comprehensive and relational understanding of the domain as it currently stands.

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