



Table1: The history of web tools present three major stages:

Generation	Institute/Educator	Learners	Device Independent	Outcome
Web 1.0	P	C	-	Democratization of Information access
Web 2.0	P C	P C	-	Democratization of Content Production
Web 3.0	P C	P C	P C	Democratization of the capacity of action and knowledge

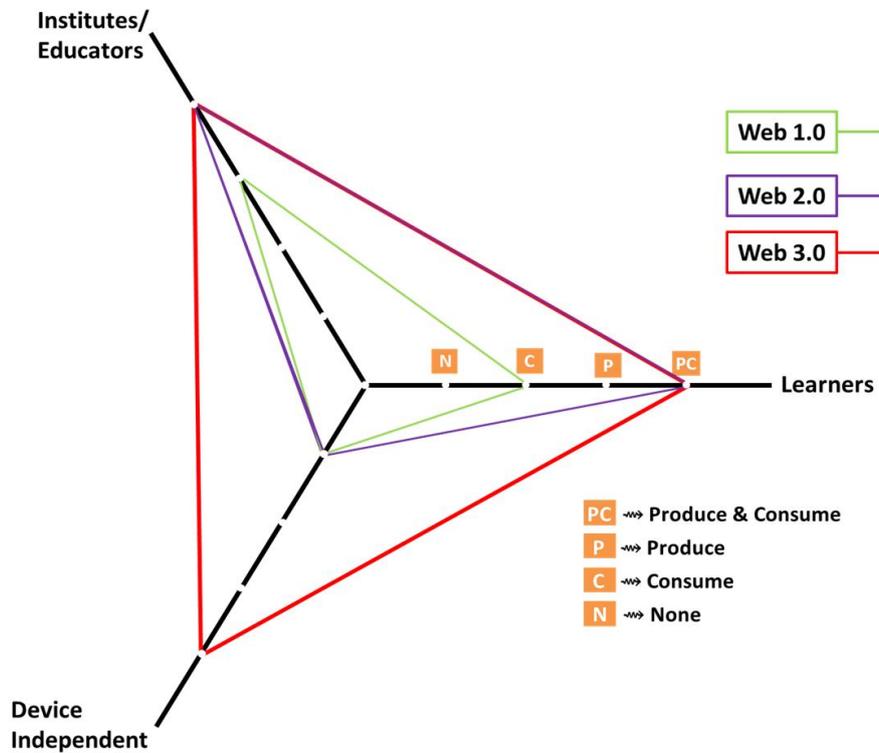


Figure 2: Spider chart showing the distribution of web tool generation

This article focuses on designing and developing a Digital Learning Hub to facilitate entrepreneurial competencies and skill levels using freely available web 2.0 and 3.0 tools.

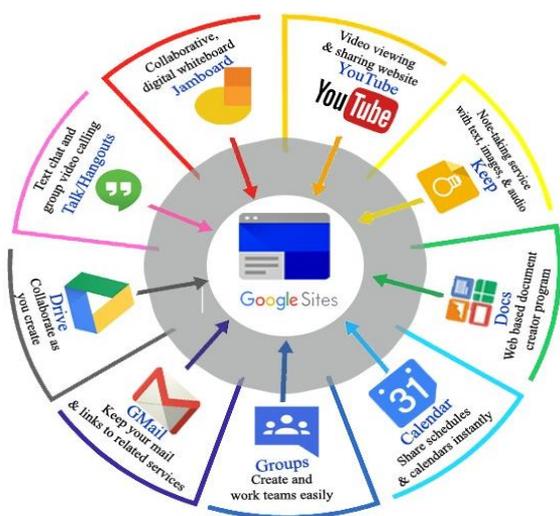


Figure 3: Integration of Google product into Google Site.

Figure 3 depicts the integration of some of these freely available tools into Google sites to build a digital learning hub for an undergraduate level introductory entrepreneurial

course. In the present study, we will make an appraisal of this digital learning hub to ensure entrepreneurial competencies and skill levels [11-12]. This article also through light on the different tools and techniques developed through this integration for the mutual benefit of teacher and learners, so that quality entrepreneurial education for everyone can be offered everywhere. Finally, we will discuss the timeframe required to develop such digital learning hub.

## 2. Statement of Objectives:

In most of the instructional strategies developed, learners' interactions with each other are a neglected aspect of instructions. The majority of them are designed around to help teachers to maintain optimum interaction between learners and study resource/tools. Some of the strategies talked about teacher's interaction with the learners but almost in all strategies, the interaction between the learners is relatively ignored. So here an approach was taken to develop a digital learning hub based on freely available Web 2.0 and 3.0 tools to facilitate learner-learner interactions along with the learner-resource and learner-teacher interactions.

The tricky part about all these Web 2.0 and 3.0 tools is, how to find the suitable one for our learners' requirements? In this article, we tried to divide it into

different parts depending on the requirement of the teacher and learner and give appropriate examples of how it could be used to enhance learners learning. Effective integration of technology is achieved when teachers able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. This paper presents the first of its kind study on integration Web 2.0 and 3.0 tools for enriching the learning experience of undergraduate level learners with introductory level entrepreneurial courses as a medium. Recommendations were made for integrating selected freely available Web 2.0 and 3.0 tools in major instructional and content areas.

### 3. Results and Discussion

All along with the evolution of globalization and digital technologies, educators have touted the benefits of learning with technology-based educational tools such as spreadsheets, videos, and databases that allow learners to actively process and manipulate information. In today's world, it is paramount that we should give our learners' skills like ideation, innovation, digital and virtual global collaboration, design thinking, adaptive thinking, etc. In one word, we need to give our learners an Entrepreneurial Mindset, an umbrella term that covers all of these skills naturally and effectively. Without the integration of technology, it is near impossible to ensure these skill competencies effectively. Hundreds of Web 2.0 and 3.0 tools are available for making the technology as tool to enrich the learning of our digital learners. Inspired by these in the present work we build a digital learning hub for an undergraduate level introductory entrepreneurial course by integrating some of the freely available Web 2.0 and 3.0 tools. Choice of the tools primarily based on their accessibility to the users at free of cost.

Today's teachers need to be aware of the fact that learners in most of the cases will be more techs savvy than the teachers because they are digital native. Now it is the turn of the teacher to learn and harness these capabilities to engage learners and promote active learning. The prime purpose of this digital learning hub is to give all the learning content of the course to their fingertips through their handheld devices. Each tab in this digital learning hub acts as an online collaborative interface for ideating, creating, innovating, sharing, tracking, documenting, reporting and delivery of electronic content to the learners and above all to enrich their learning experience. Few of the study tools developed and integrated into the digital learning hub are detailed below.

**Ideation Board:** Ideation refers to the process of creating, developing and communicating prescriptive ideas with others, typically in a business setting. The process of ideation is the stepping stone of any innovation and a quite essential part of entrepreneurial education. A tool to facilitate ideation process among learners was developed by integrating Google Jamboard and Keep with Google sites.

**Business Model Canvas (BMC):** By integrating Google sheet with Google drive features, a virtual BMC tool was developed. A short description with some dropdown examples was provided that help the learner to develop his/her first BMC effortlessly. The best benefit of the virtual BMC tool is that it acts as a physical sticky note so

that the learner can do any change or modification as and when they need it. They can use different colors for different value propositions and customer groups. Also, they can create many different versions and save it in drive.

**Market Research Tool:** Market research is an essential element in improving, evolving and truly crafting any products and services for entrepreneurial ventures. Most of these tools in this category are in the freemium category. Here we integrated freely available Google services like keyword search, and trend in our digital learning hub, to develop the market research tool for our learner which at per with any premium service.

In addition to the technological tools that facilitate entrepreneurial interaction among the stakeholders, we also developed and integrated few more technology tools that every teacher would love to have in their back yard to facilitate and enrich the learning of their learner.

**Academic calendar:** It supplements learners all academic endeavors with relevant dates and schedules for different academic activity all through the semester. This was provided to the learners by integrating Picasa web album with Google slideshow.

**Announcement page:** An announcement page with a countdown timer was developed so that it will display the latest announcements with countdown timer in it. This plugin is best suitable for highlighting the deadline for different academic activities.

All other study tools developed for this digital learning hub with the associated Web 2.0 and 3.0 tools are tabulated in Table 2.

Table 2: Different study tools developed for digital learning hub and Web 2.0 and 3.0 tools used in that	
Study Tools Developed	Web 2.0 and 3.0 tools used
Ideation Board	Jamboard + Keep
Business Model Canvas	Google Sheet + Drive
Market Research	Google Keywords + Trends + Form + Gmail
MVP	Google Drive + Docs + Jamboard
Course Calendar	Picasa web album + Slide show
Announcements page with countdown timer	Google site + Countdown timer
Today's News	Google site gadgets + Google slide
Self-Assessing Worksheet	Excel + Google sheet
Concept Maps & Study Aid	Google Drive + PowerPoint
Educational Video	Google site + YouTube
Academic Resource Search	Google site + Wolfram Alpha

Table 3 distribution of different Web 2.0 and 3.0 tools and their application in different aspects of the interaction as well as instructional area, is shown. What most important in this table is the reflection of how these tools were used to serve the need of digital learners. It was an eye-opener for us to see that some learners after completing their mandatory assigned work spent additional time to

improve upon their work as these tools empower them to do so.

Table 3: Distribution of web 2.0 and 3.0 tools across different instructional areas.

Web 2.0 and 3.0 tools		Different Instructional Areas and Associated Tools								
		Ideation Board	Business Model Canvas	Market Research	MVP	Sharing study material	Assessing learners work	Real-time interaction	Pre/Post class discussion	Academic deadlines notification
	Drive		✓		✓	✓	✓*			
	Docs		✓	✓#	✓	✓	✓*			
	YouTube					✓				
	Calendar									✓\$
	Groups							✓	✓	
	Hangout							✓	✓	
	Gmail			✓#				✓	✓	✓\$
	Keep	✓								
	Jam Board	✓			✓			✓		
#: other tools integrated e.g. Google Keywords, Google Trends in Google sites \$: Other Web 2.0 and 3.0 tools integrated e.g. Picasa web album for Google sites *: Other Web 2.0 and 3.0 tools integrated e.g. different add on with Google docs										

### Integration Web 3.0 tools for better academic search:

One of the Web 3.0 tools that we integrated with our digital learning hub and would like to specifically described in this paper is Wolfram Alpha. This Natural Language Understanding (NLU) System able to summarize large amounts of information into knowledge and useful actions for our learners. To demonstrate the fact a little comparison between Wolfram Alpha and Google Search, using both tools, typing the “Engineering and Technology” phrase in both search engines is shown in figure 4, and then we see big differences in the results:

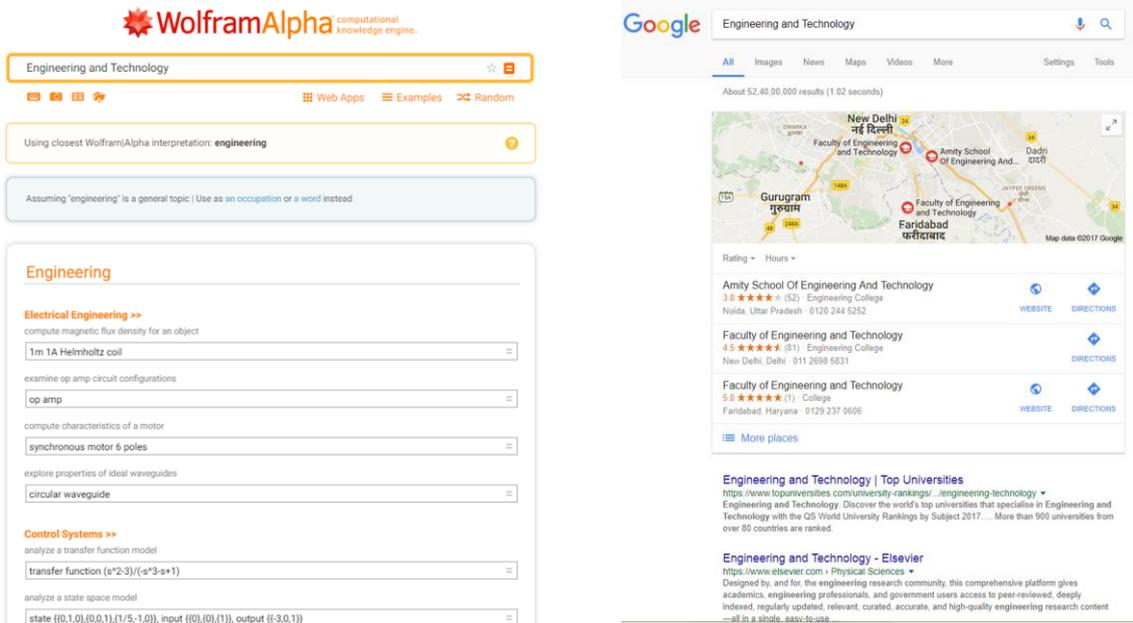


Figure 4: Search results Google vs WolframAlpha

In the case of Google, the results turn out to be mostly about Engineering and Technology institute around the locality or say top 10 or 20 of them. Note that the word “Top” or “Institutes” were not mentioned in the search. In Wolfram Alpha, the tool considers that the search is a comparison between two different branches of engineering and technology and so it consequently brings organized

statistics, important topics, and other useful aspects for comparative analysis. Thereby making it more useful from the educational resource finding point of view. Systems operating in the Web 3.0 standards, in turn, seek contextualized knowledge to assist learners in their jobs, pointing to a series of analysis and potentially helpful information.

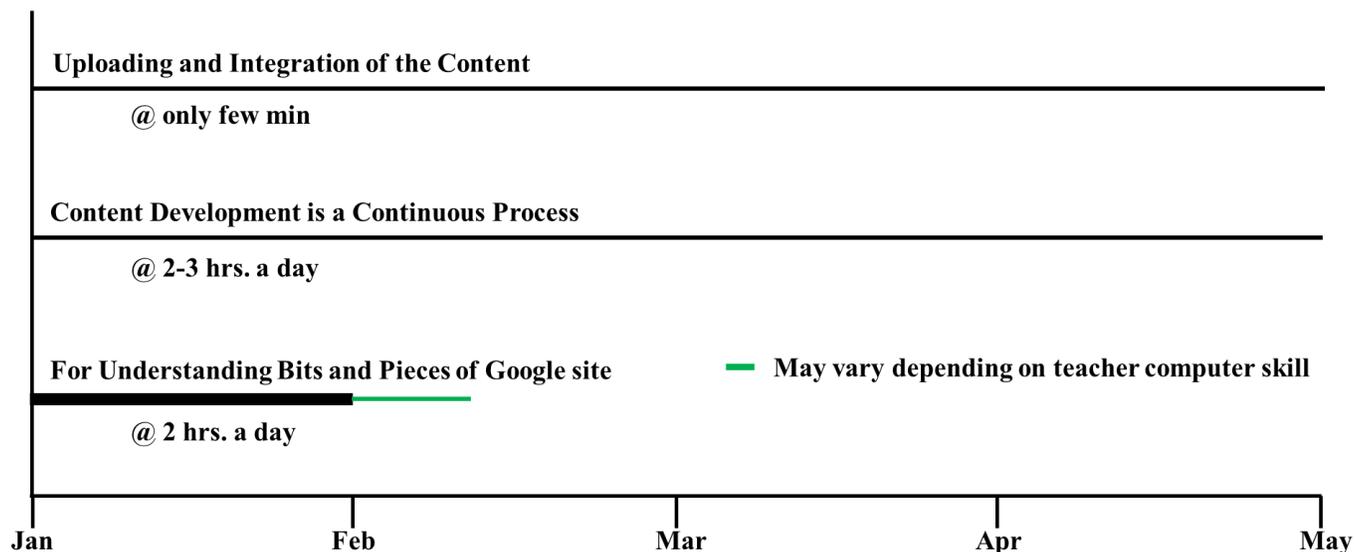


Figure 5: Timeline showing no of hours required to spend to build a digital learning hub over a period of one semester.

After successfully building the digital learning hub we wanted our reader to note that technology integration requires some extra effort from teachers end. Teachers need to allocate time on a weekly basis to educate themselves about technology tools and how they could be used for their learners. A brief outline of the time a teacher required to spend in order to build such a digital learning hub on a semester time scale was plotted in Figure 5. We hope that one-day this small effort can add more incitements that could lead and inspire other educators in their chosen fields to come up with their own digital learning hub.

Before one should start using digital learning hub integrated with all these Web 2.0 tools legal ramifications of publicly disclosing student educational work/information needs to be considered. Learners’ consent can be sought to use tools that make their work available to the web. Our submission will be teacher should use only those tools with privacy settings that ask for login.

#### 4. Conclusions

All these that we integrated is sounds very ambitious, but question may come is it also working? And if so, is it at per with commercially available LMS. The answer to these questions is a BIG Yes. As this is the only learning management system developed keeping in mind Entrepreneurial Education using freely available online

Web 2.0 and 3.0 tools. In designing the ecosystem of digital learning content for the undergraduate level introductory entrepreneurial course we adopted an approach to integrate only freely available Web 2.0 and 3.0 tools to Google sites. It really had an impact on us and our learner and affected the learning style of our learner. Our findings indicate that this learning ecosystem has proven to be helpful and engaging by the learners. What makes this work more cherished is the fact that using this digital learning hub one can easily achieve teacher-learner, learner-learner, and teacher-teacher communications, interactions and collaborations in one single platform. Moreover, it empowers the learner to navigate their reading, writing, discussion, collaboration, and creation fully on their own. We’re in the process of integrating more semantic search tools for easier searching and analytics in a comprehensive way for our entrepreneurial learners’. In conclusion, we must admit, what we have demonstrated through this digital learning hub is just a tip of the integration iceberg that all these Web 2.0 and 3.0 tools offer.

#### 5. References

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