



## Evolution of Web 3.0 Technologies in The Sector of Education

### KEYWORDS

Web 3.0, Web 2.0, Education Technology and Information and Communications Technologies (ICT)

**Dr. Samson R Victor**

Assistant Professor, Department of Education  
Indira Gandhi National Tribal University  
Madhya Pradesh

**Azim Amin Mohammed**

Research Scholar, School of Education, Christ University  
Bangalore

### ABSTRACT

*The relentless and unceasing evolution of Information and Communications Technologies (ICT) is a gateway to new opportunities, reforms, practices and improvements in the realm of technology-based education. A vital part of this progression is the way Internet technologies have changed over time. The traditional approach of the Internet, also termed as 'Web 1.0', which was also named as the 'readable' phase of the World Wide Web was a one-way medium of accessing information by the users. The succeeding version, 'Web 2.0', came across as a two-way channel, thus enhancing the capabilities of what a user could do with it. The current version that is evolving in the pipeline, known as 'Web 3.0', consists of a more interactive and dynamic interface with highly advanced features that empower machines to 'think' and 'execute' tasks, providing them with interpretation and analysing skills in order to suit the needs of the user. Hence, it is vital to study the evolution of Education Technology with Web 2.0, along with the enhancements that can be brought to the table with Web 3.0, how it facilitates teaching and learning in a progressive manner and the limitations that have to be considered. This paper attempts to understand the idea behind the enhancements in Web 3.0, the major advantages over the previous version of Web 2.0 and the possible future models, techniques and services that can be availed of with regards to Education Technology. The paper further discusses the limitations and drawbacks of this version of the Web and suggestions on implementation in the current model of education curriculum and practices.*

### Introduction:

In the current past, especially the past two decades, the set of internet technologies available to us have been on a constant update mode. The way we consume the information, transit it, use it to communicate and interact with each other has been ever changing. As we can see that the needs of a student belonging to the current 'Generation Z' have evolved to a great extent, so have the set of technologies available to the education sector.

We have been experiencing an extremely rapid amount of progress in the field of technology and internet services. This relates directly to all other sectors and spheres of our lives – from health to travel. The result of this change has given us a refined, efficient, cost-effective and prudent lifestyle. Education is also posed as one such facet that has not only changed the way teachers make use of technology to impart knowledge, but has also changed how students absorb this knowledge in an effective and productive way. With the advent of modern education technology, classrooms have become a blend of essential traditional tools of learning and the innovative and sophisticated tools from the new era, be it in schools or colleges. This applies to all the facets of learning, encompassing all subjects and themes that are taught in classrooms and labs. As opposed by many, the resources provided by the internet technologies prove vital even for instructors transacting in language teaching programs and lessons, cumulatively increasing the overall value of the environment in which the learners are present.

### Progress of Internet Technologies

At a global level, the advent of WWW (World Wide Web) has been constantly changing the way we function and interact with others. Modern-day advancements enable us to get exposed to various magnitudes of the environment we

live in and explore new things every day. The world seems to have become a smaller place due to the effortlessness with which we are able to communicate with each other while being in various locations. The internet has empowered humans with diverse tools that have radically changed the face of life. Computers in specific have played a key role in placing man at the helm of various tasks and assisted in realization of several ambitions that may not have been possible otherwise. In every walk of life, the integration of technology has played a key role in making tasks simpler, accurate and less time consuming. We have been more and more dependent on technology as new inventions are made every single day. Moreover, in this technological era, vast resources of technology have been made available to the common man easily with the help of the internet, which facilitates the widespread use of these resources.

From the 1990s when the internet technology was established, various versions have been in place starting from Web 1.0. According to a post on Wikipedia, the descriptions of the various versions of the Web are as follows:

- Web 1.0 is Read Only, static data with simple markup for reading
- Web 2.0 is Read/Write dynamic data through web services customize websites and manage items
- Web 3.0 is Read/Write/Execute

As the technology evolved to Web 2.0, users were able to access information on the internet as well as share information with others, hence making it a read and write medium. Many of the current social media, social networking and blogging sites, podcasts, P2P servers and Wikipedia itself as well are based on this technology.

In the present scenario, we are undergoing an evolution to Web 3.0, the latest version of the Web that is used to denote the future of internet technologies. Interpretation and the outlook of different developers on what the term Web 3.0 defined and the capability of the technology vary greatly. Some of them consider that budding technology like the Semantic Web will transform the way the internet is consumed by its users, and lead to new opportunities in applications based on artificial intelligence. Other futuristic purpose that the constant upgrade of internet, its capacities, speeds, graphics and modular web applications will play the primary role in the revolution of Web 3.0.

### The difference in Web 3.0:

Coined in 2006, the term Web 3.0 is the newest version of the WWW technologies that we can experience in the present era. The ex-CEO of Google Eric Schmidt states that "The core software technology of Web3.0 is artificial intelligence, which can intelligently learn and understand semantics. Therefore, the application of Web3.0 technology enables the Internet to be more personalized, accurate and intelligent."

It can be understood that Web 3.0 is a combination of various applications forming a series. The primary characteristic of Web 3.0 is intelligence, which as experts believe, will be its most promising feature. 'An intelligent Web' will be able to handle input, perform analysis in a smart and efficient manner, and then provide output in a very optimal manner. All of this is made possible without the intervention of the user. Moreover, Web 3.0 technologies offer a very high level of personalization that occurs during various activities such as processing data, searching through various portals etc.

Personalization also leads to the factor of compatibility where Web 3.0 technologies will enable customizing and independently running on different kinds of devices. An application based on Web 3.0 would be able to run on many types of computers, hand-held devices, mobiles, TVs, automobiles and many others. This phenomenon is known as 'Pervasive Web'. Finally, Web 3.0 is a technology that leads to and utilizes high speed internet bandwidths and extremely sophisticated advanced 3D graphics. This provides a very high level of virtualisation and creating personal 3D environments. A very apt example of this web application is the application Second Life, which is built on the concept of virtual reality and artificial intelligence.

### Web 3.0 in Education:

As the rate of transformation is at such a high pace, before we know it we will be dealing with completely new paradigms and dimensions in the field of education. These changes in education and education technology in particular are mainly driven by the digital culture that institutions, educators and learners have embraced over the past few years. This culture that is claimed to be established on participation, collaboration, distribution of knowledge sources, and co-creation of new resources and opportunities. While the process of teaching-learning using Web 2.0 technologies has always focused on the active participation of learners and educators among educational and social communities, various social networking tools and portals have been promoted and utilized such with blogs, wikis, Facebook, Twitter, Prezi, Slideshare etc.

However, the opportunities and services that the Web 3.0 technologies offer attempt to promote a more open approach to the learning process. Due to the usage and the

integration of high-powered Scalable Vector Graphics (SVG) and semantic data, Web 3.0 enables the building of 3-D social networking systems and immersive 3-D internet environments that incorporate the most important aspects of the virtual worlds with gaming environments, merging them with the Web and offering to its users. This initiates the beginning of a new era in the technologies of information management and sharing, which enables the availability of a large amount of content available to any combination of human and computer processing. This further results in allowing new ways of partnership and association between and across disciplines. Some of the possibilities are explained below.

Using Web 3.0 technologies can help in creation of Virtual based Encyclopaedias and Wikis. A wiki or an encyclopaedia is a repository of information and content built on the principles of knowledge creation and sharing. Using Web 3.0 technologies can bring a whole new dimension to using these tools with incorporation of 3D, Semantic and Pervasive web technologies. 3D technology used in wikis provides rich & effective multimedia content and environment involving a multi-sensory approach and using animation for learners in order to promote effective learning as the end result.

Another important development in the field of education using Web 3.0 is the process of learning with 3D virtual reality. This process involves usage of Gaming

Technology in a 3D simulated environment and the principles of augmented reality, through which a learner can explore various dimensions and concept with the help of an 'approach. This aspect involves creating and maintaining a virtual world, role-playing, simulating, 3D Modelling etc. As an end-result, educators are enabled to organize and handle classes in different 3D virtual setting or worlds in which real-like interaction is possible as it would have been in a classroom, from different geographical locations. This applies to a range of different disciplines and is very diverse.

Web 3.0 technologies have enabled the evolution of search engines to 'Intelligent Search Engines', that not only display search results on the basis of keywords provided by the user as traditional search engines do, but provide content rich results based on smart understanding of the context of the search. For a learner, this can work as a 'multimedia report' consisting of information, data and knowledge from various sources in the form of text, wikis, blogs, videos, animation and various other content. This fulfils the learner's needs at various levels and tailors their browsing experience based on their profiles.

Finally, 3D rich graphical user interfaces act as a powerful platform for the users to participate and perform collaborative activities, sharing results and exchanging media information among participants in a more natural way. This has various advantages that are mentioned in the below points:

- Make a trip to places that are not possible to visit physically
- Use 3D technology for better student collaboration and create virtual student portals
- Use Project Based Learning in a different 3D dimension to create virtual labs
- Collaborate and develop 3D simulations and virtual experiments to learn in an effective and efficient manner

**Limitations:**

- Every advancement and leap to a new technology has lead to a lot of advantages and disadvantages in the history of mankind. Web 3.0 is not short of it's limitations as well. The following points discuss some of the challenges faced by Web 3.0 in general and educational contexts:
- A lot of money is spent on R&D by governments, multinationals and various other agencies. However, it is an ongoing process and still not completely developed. Thus, investment of a large amount of resources is still considerably required and may not be extremely fruitful for everyone eventually.
- With newer technologies, the requirement of higher end devices comes into play. Older devices will not be able to handle the new technology and investing in newer form of devices which are expensive will lead to lesser rate of conversion and usage of Web 3.0, specifically in the field of education.
- Older technology adopted by educational organizations and institutions are still under development and the staff and personal are finding it hard to cope up with it. Introduction of a highly complicated technology like Web 3.0 and 3D, virtual aspects that come with it will make it extremely demotivating or time consuming for educators and students to get used to.
- The rate of change is so rapid that by the time Web 3.0 is fully adopted and used in a perfect manner all over including developing countries, the technology itself is highly likely to get obsolete. As it has been noticed in various contexts in the past, newer technologies will take over leaving a highly sophisticated technology obsolete in just a short span of time.

**Conclusion:**

While the scope of Web 3.0 goes much beyond a set of new and useful technologies and services, it does offer an array of services to make a true online and virtual classroom a reality. Also, due to its very nature, Web 3.0 services will be having a positive impact on teaching and learning. These technologies have the capability to

converge real and virtual environments, where the user will seamlessly interact with humans and machines either through virtual means or in the real world. The benefits of this can be directly aligned to the existing best practices in online

education, making the environment further sophisticated and effective in order to train the future generations in an efficient manner.

**References:**

1. Cui, J., & Wang, X. (2008). Capability sharing architecture and implementation in IM or SNS. *2008 IEEE International Conference on Service Operations and Logistics, and Informatics*. doi:10.1109/soli.2008.4686450
2. Farber, D., & Dignan, L. (2006, November 15). TechNet Summit: The new era of innovation | ZDNet. Retrieved April 10, 2016, from <http://www.zdnet.com/article/technet-summit-the-new-era-of-innovation/#!>
3. How Web 3.0 Will Work. (2008). Retrieved April 10, 2016, from <http://computer.howstuffworks.com/web-30.htm>
4. Jankowski, J., & Kruk, S. R. (2008). 2lip. *Proceeding of the 17th International Conference on World Wide Web - WWW '08*. doi:10.1145/1367497.1367694

5. Lal, R., Lal, M. (2011). Web 3.0 in Education & Research. *BVICAM's International Journal of Information Technology*, 3(2), 335-340
6. Silva, J. M., Rahman, A. S., & Saddik, A. E. (2008). Web 3.0. *Proceeding of the 1st ACM International Workshop on Communicability Design and Evaluation in Cultural and Ecological Multimedia System - CommunicabilityMS '08*. doi:10.1145/1462039.1462042
7. Web 3.0. (n.d.). Retrieved April 2, 2016, from [http://en.wikipedia.org/wiki/Web\\_3.0](http://en.wikipedia.org/wiki/Web_3.0)
8. Xiaoting, H., & Li, N. (2010). Subject information integration of higher education institutions in the context of Web3.0. *2010 The 2nd International Conference on Industrial Mechatronics and Automation*. doi:10.1109/icindma.2010.5538341