



## **Use of Web 2.0 Technologies as Mediation Tools in Higher Education with Focus on YouTube**

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### **Abstract**

Although the curricular content for similar study disciplines may differ from one higher education institution to another and from one country and/or region to another, it is without any doubt that for all, they promote active learning rather than passive learning. A recent shift has been observed where emphasis is placed on student-centered, collaborative and practical participation of learners in knowledge creation in a learning environment which is more engaging and stimulating. This has particularly been made possible by emerging educational technology mediation tools that does not only promote hands-on learning but also make the whole learning experience fun. Most of these technological tools have been effectively used by More Knowledgeable Other (MKO) in scaffolding the learners, and they have also been directly used by learners themselves as their MKO in addressing Vygotsky's concept of Zone of Proximal Development (ZPD) which is defined by Vygotsky<sup>1</sup> as 'the distance between the actual developmental level as determined by independent problem-solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers'. The main aim of this literature review is to demonstrate how YouTube as an example of Web 2.0 technology has been used as a mediation tool to facilitate teaching and learning in higher education.



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### **Introduction**

The popular fundamental theory by Lev Semenovich Vygotsky, a Russian psychologist and teacher, that use of appropriate artefacts can aid higher cognitive

realization during socio-cultural interactions<sup>2</sup> is very relevant even in today's educational systems throughout the world. This is because for meaning and/or knowledge to be constructed and/or acquired,

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relevant mediation tools must be employed to make learning possible, and sometimes more active and enjoyable. Various mediation tools have been used to facilitate interactive, learner-centered learning in an effort to produce more practical and self-directed individuals. Some of these mediating artifacts range from the conventional tools such as chalk and blackboard, and teachers or instructors knowledge in form of language, to the current and emerging technologies such as information communication technology (ICT) which includes computers, mobile phones, internet and such related technologies. In Vygotsky's socio-cultural theory of cognitive development, sometimes referred to as the first generation Activity Theory,<sup>3</sup> he emphasized the need to accomplish an outcome by meeting an objective by the subject (in education, often a teacher) through use of the most appropriate and effective mediation tools.

With the current changing trends in education systems throughout the world, emphasis is now put on the employment of technological tools that engage learners more. The impact of these changes is making inroads in the developing countries thanks to the availability of low cost technologies, communication and learning devices. This, together with free online learning resources is geared towards promoting higher cognitive thinking by actively engaging students.

The Zone of Proximal Development (ZPD) is a concept which is highlighted by Vygotsky as of paramount importance in the learning process. Technology currently used and/or tested in the learning environment has been demonstrated to 'move' learners from what they can comfortably do to what they are capable of doing, thus helping in their development of higher cognitive skills. Therefore, use of appropriate technologies and tools such as YouTube videos in managing the ZPD to facilitate learning can be viewed as serving the same purpose as making use of the More Knowledgeable Other (MKO) or scaffolding to solve the same problem.

### **Integration of Technology in Learning**

Information communication technology has greatly positively influenced our lives in recent times because among other things, it has made us

comprehend things better, do certain tasks faster and even more efficiently, often saving us time and expenses.<sup>4</sup> For instance, Oprea<sup>4</sup> observed that 'the success of the network World Wide Web is the fact that it is a huge source of information storage that can be accessed by anyone, anytime and anywhere in the world and that any administrator, with limited funds, has a chance to become an information provider'. The author notes that adoption of information technology has helped in substituting the more passive mode of learning to a more active one where learners takes part in knowledge creation and problem-solving. Creative classroom techniques incorporating technology have been shown to enable a more proactive and engaging learner environments<sup>5</sup> as students usually have a wide choice of technologically sound tools to easily access to information and use it. Vygotsky<sup>1</sup> believed that adults in the society helped in the development of children's cognitive ability by engaging them in challenging and meaningful activities through use of various mediation tools. Mediation is the interaction of a learner with the learning environment using various means and/or tools such as other people (for example teachers), as well as through use of various educational technology tools to promote knowledge creation and acquisition.<sup>6</sup>

It is of paramount importance that innovative instructors, teachers or lecturers become mediators of the students' knowledge-acquisition process rather than for example, teaching/lecturing them only, which does not promote active learning, instead, leads to passive receiving of information in a less interesting manner. In the context of learning new material, Vygotsky highlights the significance of the ZPD<sup>7</sup> which as previously mentioned, is an area in which the student can learn with the facilitation from others, more knowledgeable individuals such as teachers through use of mediating technology tools. This learning facilitation may be in form of scaffolding, whereby as the learner improves their skills, the scaffolding is removed. It can also be in form of collective working/activity that has been shown to increase the learning opportunities for students.<sup>7</sup> It is in recognizing the importance of addressing the ZPD that Vygotsky discussed the role of More Knowledgeable Other (MKO). The Vygotsky's idea of learning as mediated by a culturally MKO implies a pedagogy that aims to openly structure and facilitate

students learning.<sup>8</sup> The MKO can be an experienced and skilled person or a technology mediating tool with numerous affordances such as a computer, a computer program or various freely available online learning resources and applications that have 'more knowledge' than the learner and sometimes even the instructor.

In addition to computers and computer programs, other recent technologies and technological devices such as smartphones, smartwatches and tablets can also be used to promote social interaction and promote the learning process. For example, through online collaborative interaction with peers, students can learn from each other and also be able to access the internet at their own convenience to expand and/or improve their knowledge in certain areas that they may be deficient in. In addition, it makes it possible for the learners to engage with each other and with the educational materials available via social networking sites and social media platforms including Facebook, Wikis and YouTube, among others.

Both current and rapidly emerging technological innovations provide learners and instructors in various educational systems and set ups with alternative tools and means of accomplishing day-to-day tasks and solving a myriad of other problems that would otherwise be impossible to do.<sup>9</sup> These educational technology tools may be regarded as 'new cultural tools' which have affordances in that they can effortlessly mediate actions or learning in a classroom environment although the process of implementing them under various learning settings<sup>10</sup> may present some challenges or resistance from the would-be users. On their research work on 'understanding innovation in education using Activity Theory', some researchers<sup>9</sup> highlighted the importance of using technology tools in learning which promotes constructivist theoretical framework to learning.

#### **Application of Web 2.0 Technologies in Learning**

Web 2.0 which is sometimes called 'read write web' is a terminology which was first used by O'Reilly in 2003.<sup>11</sup> It is considered a more interactive version of Web 1.0 which was, and still is considered a less engaging version i.e. Web 2.0 is an improvement of Web 1.0<sup>11</sup>. Unlike Web 1.0, Web 2.0 can promote

problem-solving, a great pedagogical strategy in support of constructivist theory of learning.<sup>12</sup> For example, in Web 2.0, learners can actively engage in learning through online discussions in real time and this is often instantaneous, either through texts or videos which was and is not possible through Web 1.0 technology<sup>13</sup>. In Web 2.0 technology, the users actively participate in content creation rather than just passively receiving it. By definition, Web 2.0 technology is, according to Cambridge Online Dictionary<sup>14</sup> 'A name for all the internet features and websites that allow users to create, change and share internet content'. Use of Web 2.0 does not require expertize training to engage with, making it very user-friendly, particularly to novice learners.<sup>15</sup> Some of the key Web 2.0 applications are Wikis, blogs and YouTube, among others.

The current learning theories such as connectivist and constructivist (a concept underlying Vygotsky's theory) seem to be well supported by Web 2.0 technologies<sup>15,16</sup> as they are viewed to be very interactive and promoting active learning. Research has demonstrated that these technologies stimulate active collaborative learning, immensely improving learners' innovative creativity, thus knowledge acquisition and retention.<sup>15</sup> It is evident, from previous research that these technology applications can be blended in pedagogies as mediation tools to improve the learners experiences. Technology applications have several affordances,<sup>17</sup> for example, the same application can be accessed from different devices from anywhere in the world and most applications are freely available online. The current availability of affordable communication devices such as smartphones, tablets, laptops and desktop computers, especially in developing countries, which were lagging behind in matters educational technology, seems to drive the take-up and usage of Web 2.0 technologies.<sup>18</sup>

In recent times, new technologies rooted in Web 2.0 are continuously changing and challenging the way educational content is delivered to learners, especially in higher education context.<sup>19</sup>

It is without a doubt that currently, many academicians are increasingly embracing the utilization of Web 2.0 technologies in teaching and learning in their learning spaces. There is need to embrace these

kind of technologies in these kind of educational set ups as 'the failure to embrace emerging technologies in higher education courses can lead to pedagogies that risk alienating a generation of learners, some of whom demand basic instruction using new technologies'.<sup>20</sup> This is because pedagogies change with changes in mediation tools and adaptation is necessary in order to remain relevant in this dynamically changing learning environment. The need of embracing these technologies is obvious in many institutions of higher learning where many online networking and learning applications such as YouTube, Wikis, blogs, podcasting, and others<sup>21</sup> are increasingly used as mediation tools to enhance knowledge construction while improving learners' engagement.

#### **YouTube as an Example of Web 2.0 Educational Technology Tool**

YouTube was created by three people; Hurley, Chen and Karim in 2005<sup>22</sup> to aid sharing of videos online.<sup>23,24</sup> Besides being a source of entertainment, it has also tremendously grown to be a free teaching resource for educators in recent times.<sup>5</sup> Any interested user of the service can access it on [www.youtube.com](http://www.youtube.com) so long as they have internet connectivity capabilities. YouTube has in recent times caught the attention of many innovative educators owing to its potential for use as a teaching and learning mediation tool. Several institutions of higher learning are using it, for example, Google for Education (<https://www.youtube.com/user/eduatgoogle>) demonstrates acknowledgement and continued use by institutions of higher learning of video recorded lectures and other institutional activities online. YouTube provides a wide category of people with a variety of freely available videos, all what is required is internet connection and a device or a tool on which to stream or download the video(s). YouTube 'is a service for educators which contains short lessons from teachers, full university courses and professional development videos from academicians'<sup>23</sup> which indicates how rich of a resource it is for lay persons, instructors, learners and researchers among others. 'YouTube for schools allows institutions to access thousands of educational videos from vetted YouTube channels like TED and Khan in a secure environment.'<sup>23</sup>

Together with other web-based video sharing sites, YouTube is considered an important innovative emerging technology in higher education.<sup>25</sup> The use of online networking sites such as YouTube as engaging and entertaining learning mediation tools in classrooms have become vital among instructors in an effort to promote active learning and improve motivation among the learners to want to learn even more according to several researchers.<sup>26</sup> There is currently an increasing trend in the number of educators who are introducing YouTube as a mediation tool in their pedagogies. For example, research has indicated that 33.3% of ICT lecturers in South Africa used YouTube for teaching while 66.7% felt it was a good idea to incorporate it in classroom.<sup>26</sup> According to Pew Internet and American Life Project findings, many students in higher education can comfortably engage with content using technologies analogous to YouTube in carrying out certain tasks,<sup>5</sup> which means that YouTube can support these students' digital learning approaches. In addition, this technology can offer an opportunity for new learners to experience new technologies that would equip them with lifelong skills for their future careers.<sup>5</sup>

#### **Using YouTube as a Learning Mediation Tool to Bridge Vygotsky's Zone of Proximal Development**

The ZPD is probably the most well-known concept of Vygotsky's theory which was commonly in use in the developmental process of children.<sup>27</sup> Vygotsky emphasized on assessing, not only on the child's developed level, but also the child's probable or potential development.<sup>27</sup> This ZPD concept though previously used in child developmental psychology, can be extrapolated to learning in higher education (where we can substitute a 'child' for a 'learner') where various means to bridge ZPD have been explored and reported in literature. It is not uncommon to find usage of terms/phrases such as scaffolding and More Knowledgeable Other (MKO) or More Capable Other (MCO) being used as means of addressing the ZPD. Scaffolding is a means of assisted learning i.e. offering a non-permanent support to a learner<sup>28</sup> which is made possible through intervention by more experienced persons such as teachers/lecturers, parents or any other individual who has more knowledge and/or skills than the learner (i.e. MKO). Scaffolding can also be defined

as 'a bridge used to build upon what students already know to arrive at something they do not know.'<sup>29</sup>

Vygotsky<sup>1</sup> is cited by an author defining an MKO as 'an essential component of the learning process with more knowledge or a greater understanding of a particular task or process than the learner'.<sup>30</sup> It can also be a technology mediating learning tool such as YouTube which has the potential to significantly increase the learning opportunities for both the learners and the instructors.<sup>30</sup> What this means is that YouTube as an example of Web 2.0 technologies can be used by an MKO or even by itself to address the ZPD through scaffolding. Use of YouTube as a mediation tool should be integrated into guided learning opportunities that offer technology-assisted situations in which students are supported in the construction of relevant understanding within an authentic context.<sup>30</sup> According to Vygotsky's theory, tools or artefacts can influence the way students learn and interact with their learning environments.<sup>27</sup> Use of YouTube to mediate learning in a classroom environment can be an innovative, creative and an engaging means of addressing the ZPD as it can bridge the gap between digital native students and their teachers.<sup>31</sup> Extensive research has demonstrated that students learn and retain content better when, in addition to their audio stimulation, visual stimulation is aroused as well, as this tend to significantly improve their cognitive abilities, and more learning occurs<sup>32</sup> helping in more knowledge acquisition and retention, thus helping in the narrowing of the ZPD.<sup>32</sup> YouTube give an opportunity to the learners to study content like they would in a face-to-face class with an MKO, even in his/her absence. This is particularly important as it can be done in an asynchronous manner and greatly enhance change of pedagogies for the better e.g. facilitating adoption of flipped classes.<sup>31</sup> With widespread availability of affordable and portable electronic learning and communication devices, coupled with cheap internet connectivity and sometime free WiFi, lecturers can effortlessly share content with their learners aiding them revise content better.<sup>33</sup>

Extant literature highlights the importance of incorporating educational videos in pedagogies in higher education to promote student-centered and collaborative learning. Videos have been

demonstrated to evoke emotions in learners' mind arousing learning, heightened engagement and excitement in the classroom environment,<sup>34</sup> effects of which have been shown to promote self-directed learning.<sup>35</sup> Enhanced learners' interest and motivation in a given subject as a result of teaching using educational videos promotes constructivist pedagogic model of learning. Engaging learners by use interactive social media technologies such as YouTube has been reported to contribute towards the achievement of higher order thinking<sup>36</sup> and according to Archambault *et al.*,<sup>37</sup> motivation to learn more evoked by use of videos is a good case of cognitive engagement. YouTube has greatly enhanced learner-centered and collaborative approaches of learning where they have also been shown to trigger discussions amongst learners that can be guided by the instructor enhancing behavioral engagement.<sup>33,38,39</sup> Some researchers have also reported that learners felt that a blend of asking questions, response and additional explanation from the instructor augmented the value of the educational video which is considered an excellent example of emotional engagement in practice.<sup>40</sup>

### **Challenges that May be Experienced in Incorporating YouTube Videos in Teaching and Learning**

Even with several benefits associated with videos in learning, there are challenges. For example, obtaining a relevant video of interest may not only be a difficult task but also time-wasting, especially when the instructor has no specific video in mind as the website may contain numerous videos to search through.<sup>5</sup> As YouTube is a platform where any user is free to share whatever they want, learners may have challenges in obtaining the appropriate videos in terms of correctness of content, that is, accuracy and credibility of the videos posted may often be questionable.<sup>25</sup> There is need for instructors to carefully review the entire YouTube videos content they wish to engage the learners with before using them in class to ensure that both the language and content are appropriate for learning.<sup>31</sup> It is also advisable for the instructors to add a disclaimer indicating that that the video (content) is from YouTube.<sup>5</sup> Lack of ICT infrastructure within a higher education institution may also hinder uptake of YouTube as a mediating tool in learning, for example, lack of enough bandwidth and hardware in

classrooms or lecture halls, which may be a common scenario in many developing countries which are not yet tech savvy. An excellent YouTube educational video may also not always be online for learners and instructors to refer to at their convenience as it may be removed from the site for various reasons.<sup>31</sup>

### Conclusion

Recent advancement, implementation and use of current and emerging technologies as mediation tools in higher education training has significantly promoted and improved active learning and production of self-directed learners, which is the main goal of today's education systems worldwide. Vygotsky's theory advocates use of appropriate mediation tools in the development and acquisition of knowledge, addressing his famous concept of ZPD. Several technologies can be integrated in pedagogies to address this ZPD, and one of the most important of these technologies are highly engaging mediation tools within the Web 2.0 technologies. One of the excellent tools that have witnessed significant usage in higher education in recent times is YouTube

which promotes learning through use videos posted online. YouTube can be used by the MKO to guide students learning, or it can be used by learners themselves directly as an MKO owing to its several affordances. Use of YouTube in higher education has particularly been very useful and effective in flipped classes where learners study using them before lectures, and contact time used for hands-on collaborative activities fostering active rather than passive learning. Teaching using this mediation tool is on an upward trajectory in developing countries and with the increasingly upgrading of the ICT infrastructure, the momentum of usage can only get better.

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