Online Tools for Teaching and Learning

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Abstract: Learning online is education taking place over the Internet. Among other words it's sometimes referred to as "e-learning. "Online learning, however, is only one form of "distance learning"-the paragliding term for any learning that takes place over distance and not in a typical classroom. e-Learning is defined as a learning system focused on formalised instruction but using online tools. Online teaching usually refers to classes that are conducted exclusively online , meaning physical or on-campus class sessions are not available. A thorough literature search was performed using the database like Pubmed, google scholar, BioRxiv, MESH , Cochran database using the keywords ' online tools' ,' teaching' and 'Learning' with no date and year restrictions. The language is restricted to English. 15 articles with similar data have been found which were analysed and have been included in this study. Mind maps were done using Xmind, Diagrams were drawn using brushes redux app and tabular columns were made using Google documents application. The recent articles discussed in this study help us in gaining further knowledge about assessment of the widely used online tool for learning and teaching. In conclusion, Edmodo, Google classroom are more widely used online tools for learning and teaching because it connects teachers and students and is assimilated into a social network.

Keywords: Online tools; Computer Managed Learning; Computer Assisted Learning; Learning; Teaching.

INTRODUCTION

Learning online education is taking place over the Internet. Among other words it is sometimes referred to as "e-learning. "Online learning" is the only way of "distance learning"-the paragliding term for any learning that takes place over distance and not in a typical classroom(McDonald *et al.*, 2015). Online teaching usually refers to classes that are conducted exclusively online, meaning physical or on-campus class sessions are not available(Lee, 2009a). Online courses can be tailored for a handful of enrolled students, or they can be made free and available to a wide range of participants, for example through a MOOC(Lee, 2009b). e-learning is defined as a learning system focused on formalised instruction but using online tools. Although teaching may be centered in or out of the classrooms, the key component of e-learning is the use of computers and the Internet(Kidd, 2020). There are various applications like Edmodo, Google classroom, brushes redux, quiz up, zoom etc which will be seen in detail in our review literature. In the classroom, a variety of instruments can be used to support student learning, ranging from traditional to high-tech options. Examples include the smart board, sticky notes, banners, monitoring system for viewers (e.g. clicker advanced technologies), collaboration tools with Google, 3D printing, and wikis. There are 12 tools required for teachers to teach students like they teach them in person they are; virtual white boards, document collaboration, screen record8ng, video chat, student homework, online course builder alternatives and the online tutor's toolbelt(Kim, 2020). There are few strategies supposed to be followed by teachers while conducting a remote classroom. Those strategies are establishment of teachers present the right way, always being available, usage of online resources, don't lecture, assignments have to be made clear, provide ongoing feedback. This is now used by more than three million people worldwide today and very useful during pandemics like COVID-19(Leigh *et al.*, 2020). WizIQ is one of the best and most popular online school apps worth a try. WizIQ is more suitable for teachers, tutors and universities offering online courses but it can also be used by businesses and individuals to share their expertise online(Ahmed and Osman, 2018).

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Our University is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha *et al.*, 2014) , (Praveen *et al.*, 2001),(Devi and Gnanavel, 2014), (Putchala *et al.*, 2013), (Vijayakumar *et al.*, 2010), (Lekha *et al.*, 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy *et al.*, 2016) (Gopalakannan, Senthilvelan and Ranganathan, 2012), (Rajendran *et al.*, 2019), (Govindaraju, Neelakantan and Gutmann, 2017), (P. Neelakantan *et al.*, 2015), (PradeepKumar *et al.*, 2016), (Sajan *et al.*, 2011), (Lekha *et al.*, 2014a), (Neelakantan, Grotra and Sharma, 2013), (Patil *et al.*, 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab *et al.*, 2017), (Eapen, Baig and Avinash, 2017), (Menon *et al.*, 2018), (Wahab *et al.*, 2018), (Vishnu Prasad *et al.*, 2018), (Uthrakumar *et al.*, 2010), (Ashok, Ajith and Sivanesan, 2017), (Prasanna Neelakantan *et al.*, 2015). Hence we have conducted this review for knowlege of online learning.

Online Learning and Teaching

Online learning is defined as a learning system focused on formalised instruction but using online tools. Although teaching may be centered in or out of the classrooms, the key component of Online learning is the use of computers and the Internet. Although teaching may be centered in or out of the classrooms, the key component of Online learning is the use of computers and the Internet(Butakov and Shcherbinin, no date).

Online learning can also be termed a network enabling the transfer of skills and knowledge, and at the same time or at different times the delivery of education to a large number of recipients. Earlier, it was not wholeheartedly accepted, as it was assumed that this system lacked the human element needed for learning(Butakov and Shcherbinin, no date; Chao, 2009). However, it is now embraced by the masses, with the rapid progress in technology and the advancement in learning systems.

Introduction of computers into human life was one of a basis of revolution and as we get hooked to smartphones , tablets, etc., these devices now have an important place for learning in the classrooms. Eventually , books were being replaced by electronic study materials such as optical discs or pen drives. You can also share knowledge via the Internet, which is accessible 24/7, anywhere, anytime(McDonald *et al.*, 2015).

Online learning has proved as one of the best means in the corporate sector, particularly when training programs are conducted by MNCs for professionals worldwide and employees are able to acquire important skills while sitting in a boardroom or holding seminars that are conducted under one roof for employees of the same or different organizations(Shahbazi, 2020). The schools that use e-learning tools are a step ahead of those that still have the conventional learning approach.Online Learning imparts and facilitates media, electronic devices such as that on the Internet, CD-ROMs and DVDs, streaming media etc.

Types of e-learning and e-Teaching

Many educational scientists defined forms of e-learning according to learning devices, while others preferred to concentrate on specific metrics such as synchronicity and quality of learning(Dawley, no date). There are the 10 main e-learning types:

Computer Managed Learning (CML)

Computers are used to monitor and evaluate learning processes in the case of computer-managed learning (CML), also known as computer-managed instruction (CMI). Computer-managed learning systems operate through databases for knowledge(Dawley, no date). These databases contain bits of information to be learned by the student, along with a number of ranking parameters which allow the system to be individualized according to each student's preferences, Due to the two-way communication between the student and the computer, it is possible to make determinations as to whether the student achieves their learning goals at a satisfactory level. If not, then the processes can be repeated until the student has achieved the learning goals they desire.

Computer Assisted Instruction (CAI)

To enhance learning, computer-assisted training methods use a combination of multimedia, such as text, graphics, sound, and video. CAI's primary value is interactivity – it allows students to become active learners rather than passive learners, using various methods such as quizzes and other computer-assisted mechanisms of teaching and testing(Premawardhena, 2011)**.**

Synchronous Online Learning

Synchronous online learning allows student groups to participate simultaneously, from anywhere in the world, in a learning activity together. Real-time online synchronous learning often involves online chats and videoconferencing, as these tools allow training participants and instructors to immediately ask and answer questions while being able to communicate with other participants. In the case of asynchronous online learning , student groups research independently from each other at various times and places, without there being real-time contact. Asynchronous e-learning methods are often seen as more student-centered than their synchronous counterparts, as they give more flexibility to the students(Todorova and Mills, no date; Premawardhena, 2011). For these reasons , students who do not have flexible schedules often prefer asynchronous e-learning because it allows them to use self-paced learning.

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Fixed Online Learning
Fixed e-learning is a fancy name for something you'll probably already know.In this context, "fixed" means the content used during the learning process does not change from its original state and all the participating students receive the same information as all the others(Mahlow, no date). The teachers predetermine the materials and don't adapt to the preferences of the students.

Adaptive Online Learning
Adaptive e-learning is a modern and creative form of e-learning, making it possible for every individual learner to adapt and redesign learning materials(Piotrowski, no date).Taking into account a number of parameters such as student performance, objectives, abilities , skills, and characteristics, adaptive e-learning tools enable education to become more individualized and student-centered than ever before(Piotrowski, no date; Basal, 2019).

Linear Online Learning
Linear communication when referring to human-computer interaction means that information passes from sender to receiver, without exception. This becomes a very limiting factor in the case of e-learning, since it does not allow for two-way communication between teachers and students. This kind of e-learning does have its place in education, though with time it becomes less relevant. Sending television and radio training materials to the students are classic examples of linear e-learning(Benton, no date; Piotrowski, no date; Basal, 2019).

Interactive Online Learning
Interactive e-learning enables senders to become receivers and vise the other way around, effectively allowing for a two-way channel of communication between the parties involved. The teachers and the students can make changes to their methods of teaching and learning from the messages sent and received. For this reason, interactive e-learning is much more popular than linear, as it allows teachers and students to communicate with each other more freely(Yount and Tandoh, no date).

Individual Online Learning
In this context , individual learning refers to the number of students involved in achieving the learning goals, rather than to the student-centeredness of the material(Dixon, Shewell and Crandell, no date). The style of learning has been the standard for thousands of years in traditional classrooms. The students review the learning materials themselves (individually) while practicing individual learning, and they are required to achieve their learning goals on their own. This style of learning is not suitable for the development of communication skills and teamwork skills in students, since it focuses primarily on learning individually from students, without contact with others(Finkelstein, 2006).

Collaborative Online Learning
Collaborative e-learning is a modern type of learning method, through which multiple students learn together as a group and achieve their learning goals. To achieve their common learning goals, the students must work together and practice teamwork(Dawley and Lisa, 2007).This is done by forming effective groups, in which each individual student has to take into account each other's strengths and weaknesses. This boosts the students' teamwork abilities in communication skills. This boosts the students' teamwork abilities in communication

skills. Additionally , some educational scientists preferred to define forms of e-learning more clearly(Hockly and Clandfield, 2010).Some kinds of e-learning such as CML and CAL do not need to take place online, but they are still considered types of e-learning(Bender, 2003).

Learning styles
This is an acronym that refers to the four learning styles: preference for visual, auditory , reading / writing and kinesthetics. VARK focuses on the premise that students retain and interpret knowledge differently, and that they have "preferred learning modes" to help them to learn their best(Ramirez and Gordy, 2020).

Advantages of e-Learning
1.Online learning is self-paced: Students studying online can plan their own time schedule, without having to make personal sacrifices to meet the teachers' and traditional universities' class attendance requirements(Quigley *et al.*, 2020).
2.e-Learning is student-centered: Student-centred learning (SCL), also referred to as learner-centric education, is a modern method of learning that aims to put the students at the center of attention rather than the teachers. The reason I've listed it as an e-learning advantage is that student-centric learning goes hand in hand with e-learning.
3.e-Learning is cost-effective: Due, among other factors, to simplified logistics and lower travel costs, learning institutions that use e-learning can expect to save 50 to 70 percent on overall training costs(Barton, no date).
4.Individual learning styles: e-learning takes into account individual learner differences and allows students to practice their own individual learning styles.
Customizable learning environments: Researchers found that employees who work in environments with no pictures, plants, souvenirs and others were 15 percent less productive than those who work with said distractions.
5.e-Learning fully utilizes analytics: Data is the new oil, and e-learning makes much more efficient use of the student data than any other method of history learning. That is because of the analytics of e-learning. E-Learning Analytics is the extraction of valuable information from online learning management systems and it is another of e-Learning's greatest advantages.
6.Online learning could solve teacher scarcity: Educational economists at the EPI (Economic Policy Institute) wrote in their report in 2019 that the shortage of experienced teachers is "real, big, growing and worse than we even think". In addition, the Learning Policy Institute known as LPI has on numerous occasions and also identified the problem of teacher scarcity, describing it as "one of the most pressing issues facing policymakers(Davis, 2009)."
7.e-Learning is environmentally friendly: On average, distance learning courses consume 90% less energy and emit 85% less CO_2 emissions compared to traditional university courses.Additionally, because e-learning is a paperless form of learning, it does not lead to many of the environmental concerns associated with paper production.
8.No need for textbooks: The textbook industry's overall value is $7-$10 billion, and the average college student spends about $1.200 a year on textbooks alone. Many students fund their purchases of their student loans from their textbooks, and students graduating with student loans are known to experience increased stress and depression(Warnock and Gasiewski, 2018).
9.Online learning is time-efficient: Compared to conventional classroom instruction, online learning decreases learning time by 25 percent to 60 per cent. This results in a highly time-efficient learning solution for both the students and the teachers, coupled with the advantages of self-paced e-learning(Darby and Lang, 2019).

Disadvantages of e-Learning:
The main disadvantages of e-Learning, it can get knowledge on a theoretical basis and it may be a little different when it comes to using whatever is learned.There's a lack of face-to - face learning experience here(Mehta, 2020).
Most evaluations online are limited to questions that are of an objective nature only. There is also the issue of the degree to which online learning programs provide protection. Also, the authenticity of the work of a particular student is a problem since online just about anyone can do a project rather than the actual student itself(Mahendran *et al.*, 2020; Mehta, 2020).
One more disadvantage of e-learning is it cannot contribute to actual research like contact classes. Many research and scientific contributions are there to the field of medicine for the management of disease such as diabetes, cancer, hepatotoxicity(Lakshmi *et al.*, 2015; Anitha and Ashwini, 2017; Ashwini, Ezhilarasan and Anitha, 2017; Ezhilarasan *et al.*, 2017; Lakshmi, Ezhilarasan, Nagaich, *et al.*, 2017; Lakshmi, Ezhilarasan, Vijayaragavan, *et al.*, 2017; Ezhilarasan, 2018; Perumalsamy *et al.*, 2018; Gheena and Ezhilarasan, 2019; Mehta *et al.*, 2019). Many research on nanoparticle based formulation are going on to benefit the general public(Karthiga, Rajeshkumar and Annadurai, 2018; Menon *et al.*, 2018; Rajeshkumar, Agarwal, *et al.*, 2018;

Rajeshkumar, Kumar, *et al.*, 2018; Sharma *et al.*, 2019). *Brassica olerace*a which helps in synthesis of zinc oxide nanoparticles and its antibacterial activity are effective against infectious bacteria.

Assessments that are generally marked with computers tend to be based solely on knowledge and not necessarily on practicality**.** The main need of this research is to know different and best online tools for learning and teaching and their advantages and disadvantages. Online tools which have made learning and teaching possible even during this pandemic: COVID-19(Ng *et al.*, 2020).

Emergency remote teaching:
Remote Emergency Teaching. Unlike experiences which are planned from the outset and designed to be online, emergency remote teaching (ERT) is a temporary shift from instructional delivery to an alternative delivery mode due to crisis circumstances(Kim, 2020).

Role of teachers in e-learning:
Teaching in a conventional learning environment is distinct from online teaching. Here's the teacher's job at online classroom:

A proper guide: An online teacher has to play the role of guiding students through one or more experiences of online learning.After all, various learners online prefer different styles and modes of learning. Therefore, online teachers ought to change their teaching method to provide personalized education accordingly(Leigh *et al.*, 2020).

Motivator: It's not a secret that online learners will stay inspired during their course online. Learning online is hard work.Without a proper dose of motivation and support, learning online can feel lonely and discouraging. Thus an effective online teacher needs to make good efforts to communicate to individual learners specific encouraging messages.

Role model: This is an important online instructor position.A lot of people concentrate on the teacher's role as a role model. This is what it takes. A professor is not God. They can however be massive support systems for students , particularly online students(Colt and Williamson, 2020).

Individual Mirror: The online teachers have an essential responsibility to provide input. Virtual teachers at an accredited online school in Cambodia, for example, have received honest feedback in a timely manner to contribute to a child's academic as well as personal growth.

Co-learner: Teachers online must themselves be successful learners.That is because the methods of online education change very frequently. Therefore, first they need to train themselves before taking any classes online. Therefore they must be lifelong learners. They can model that learning in the virtual classroom for their students in a number of ways(Guo *et al.*, 2020).

Effective communicator: In an online learning environment, teacher-to-student and student-to - student communication play a vital part.Students are also asked to complete an Orientation before commencing their course online. This session usually stresses the importance of continuous contact with the teacher.This also offers tips for effectively interacting online. Great lighting is important(Regmi and Jones, 2020).

Essential Equipment Guide for Teaching Online:
A camera capable of shooting video (even a smartphone could work!) A microphone (can be integrated in the camera but we recommend using a cheap external microphone). Hosting your videos, audio interviews, and other multimedia material is an online guide(Rodríguez-Ríos *et al.*, 2020). A way for the students to accept the payments.

Online tools for learning and teaching:
Edmodo: Tools and resources offering a variety of languages to manage classrooms and engage students remotely(Swan Sein *et al.*, 2020).

Google classroom: This is a free web service developed for schools and various Educational institutes by Google which purely aims to simplify paperless formation, distribution and also grading of assignments provided which is manually grading system has been implemented here(Mayne, Wilson and Kennedy, 2020).

Google duo: Google Duo is a Google-developed mobile video chat app, available on Android and iOS operating systems(Yacob *et al.*, 2020).

Brushes redux: Redux Brushes is a painting app exclusively designed for iOS. An accelerated painting engine based on OpenGL allows painting smooth and sensitive -even with enormous brush sizes. In your painting Brushes also records every step.

Simple mind: Mind mapping helps organize your thoughts, keep things in mind and create new ideas(Stuij *et al.*, 2020; Yacob *et al.*, 2020).

Kaizala: This is Microsoft application which provides a secure chat and messaging software that allows smartphone users to send messages instantly , Kaizala also provides options like sending files and attachments such as images , documents, videos , audios and more.

Zoom: Zoom is a cloud-based video conferencing service that you can use to meet virtually with others-either video or audio-only, or both, all while conducting live chats-and it allows you to record those sessions for viewing later(Regier, Smith and Byers, 2020).

Quiz up: Fun, addictive, challenging, trivia online which has the best of two worlds.

Go to webinar: The free smartphone app GoToWebinar helps you not only to see and hear webinars but also to participate in them.You can ask questions wherever you are, take part in surveys and more. Attend online activities when you're on the move, and participate.Join in with only one tap(Yera *et al.*, 2020).

Edraak: Online Arabic language education with tools for teachers and school learners.

Gram staining app: It is used to identify and classify bacteria as either Gram positives or Gram negatives based on the structure and content of the cell wall(Walsh *et al.*, 2020).

Future Scope

According to the research report, "India E-Learning Market Outlook for FY'2018–Growing Technology Adoption to Drive Future Development, the market is expected to grow at a CAGR of 17.4 per cent over the FY2013-FY'2018 period, driven by several factors such as rising government initiatives to promote e-learning(Silva Ezequiel *et al.*, 2019)**.**

CONCLUSION

There are multitudes of ways for engaging with learners online, creating a supportive environment, usage of a mix of learning tools, providing ongoing feedback and making e-Learning content in the mobile format would be helpful in improving the quality of online learning and teaching. After extensive literature study it is concluded that Edmodo, Google classroom, zoom are more widely used online tools for learning and teaching because it connects teachers and students and is assimilated into a social network.

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