

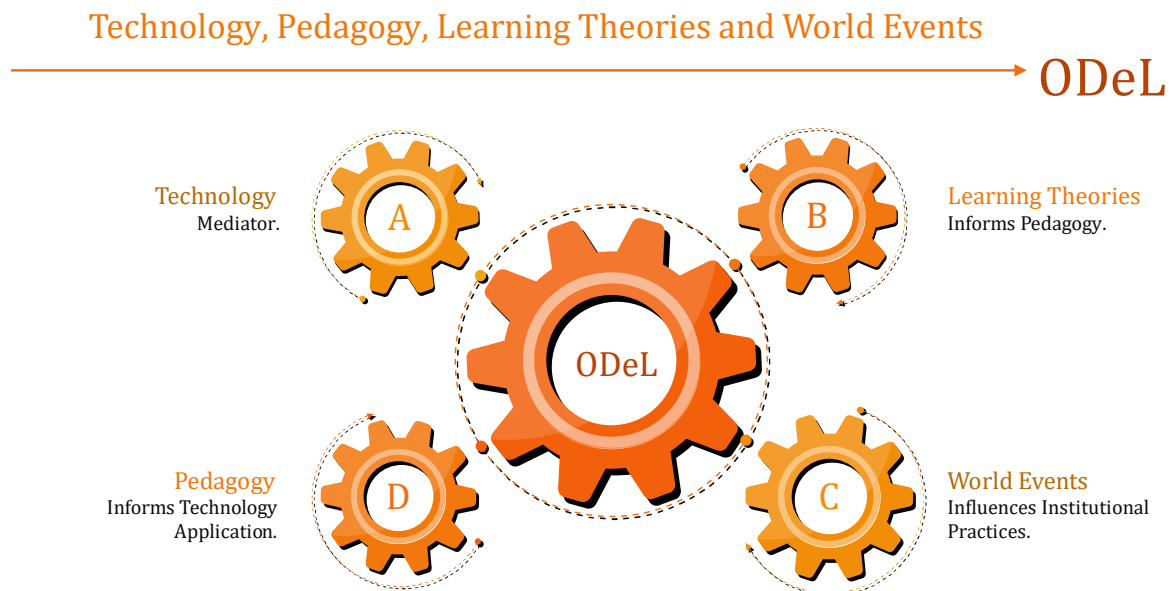
# Technology, Pedagogy, Learning Theory and World Events: Defining Open, Distance and eLearning Practice

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## 1 Introduction

This resource traces the symbiotic relationship between technology, pedagogy, learning theory and world events through the ages since the beginnings Open, Distance and eLearning.

Technology plays a crucial mediating role in facilitating learning in ODeL contexts, learning theories play an important role in pedagogical approaches to teaching and world events have influenced educational institutional practices (Figure 1). The evolution of computers in learning is an interactive byproduct of ongoing developments in psychology, pedagogy, and technology. Whether leading or following, technology has assumed a prominent role in applying pedagogy. The following section covers the beginnings of ODeL which are traced back to correspondence learning in the



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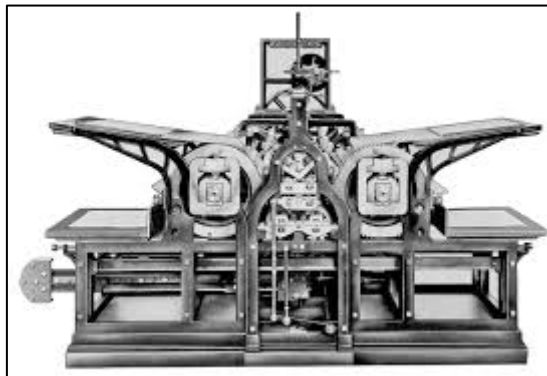
Figure 1: Technology, Pedagogy, Learning Theories and World Events impact ODeL Practices

## 1.2 Correspondence Learning

Correspondence learning can be traced back to the 18th century in 1728 Caleb Phillips advertised in the Boston Gazette to teach shorthand by mailing postcards with transcribed lessons and receiving student transcripts for correction.

The technology of the period was the printing press which allowed for mass printing of educational content for distribution to and from students via the postal services. This was enabled by the first industrial revolution of the time.

The steam-powered rotary printing press, was invented by Richard Hoe in 1843 revolutionising the printing process by making it faster, and able to print millions of copies in a day (JH French & CO Limited).



Steam-Powered Printing Press

(source: <https://ageofrevolution.org/200-object/koenigs-steam-powered-printing-press/>)

The pedagogical approach during correspondence learning was the guided didactic conversation characterised by:

- Teacher-centered: The teacher selects the lesson's content, directs the learning activities and carries out students' assessments.
- Content-oriented: Students listen to and internalize or memorise the knowledge that the teacher presents.
- Passive learners: The students listen passively.

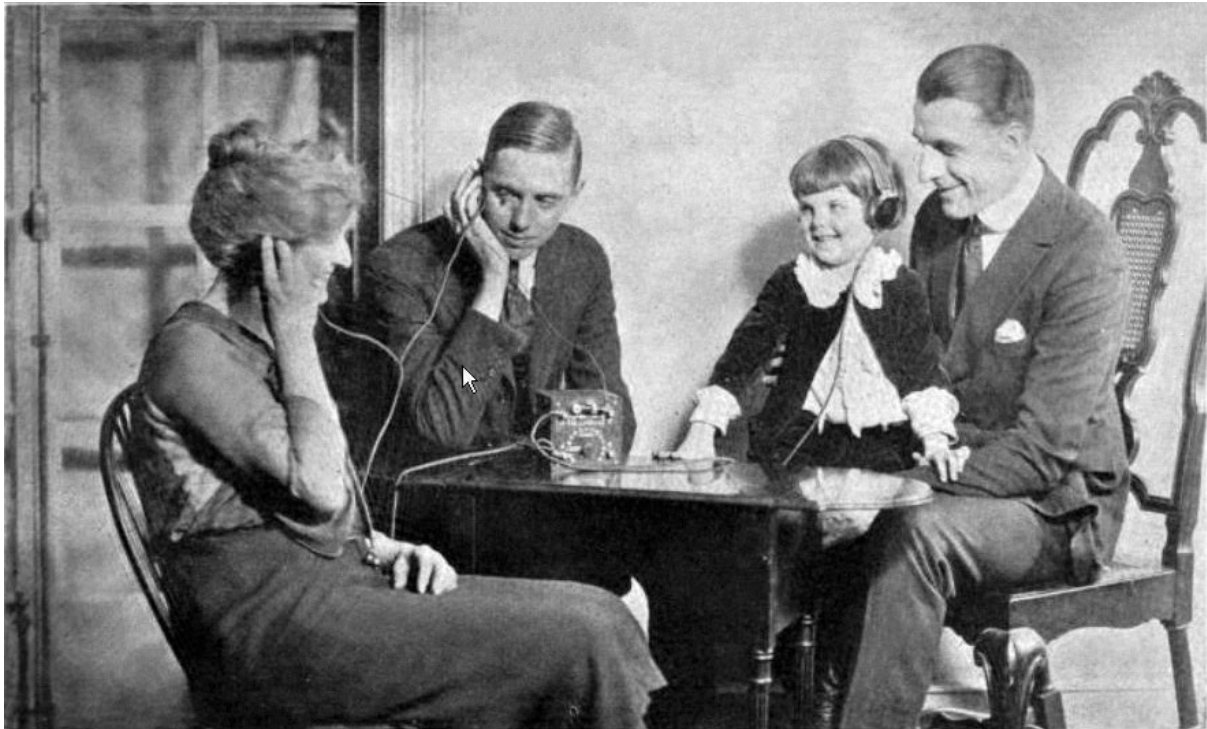
Correspondence learning was the result of the governments and educators recognising and implementing the social justice mandate of offering education to those without access to educational institutions.

### 1.3 The Radio

The advent of broadcasting (offering a framework for the incorporation of technology) began in the 1920s. It was the first form of modern communication and politicians realised its use to reach a wide audience and sway public opinion. It played a crucial role in World War 2 for communication between army commanders and troops.

The radio led to active engagement and interaction between teachers and students and complemented correspondence learning. The radio allowed the instructor's voice which complemented and supplemented text content. Instructors were able to incorporate audio material in their lessons.

Radio opened the door to collaborative learning through collaborative listening groups who met and listened to lessons and learned interactively. Synchronicity offered by the radio improved the learning processes.



By Unknown author - Downloaded 2010-02-27 from Alan Douglas (1995) Radio Manufacturers of the 1920s, Vol. 2, Sonoran Publishing, USA, ISBN 1886606005, p. 3 on Google Books. Source credits it to Radio World magazine, 1922., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=12143148>

The pedagogical approaches that were introduced by the affordances of radio included synchronous active and real-time learning.

However, as is the case with technology, the radio was an exclusionary technology as not all students had access to it.

In terms of professional development, apart from teaching methods, instructors had to learn how to use broadcast equipment. This signaled teacher professional development as it is seen and practiced today.

#### 1.4 The Development of Learning Theories

The 1960s and 1970s saw many learning theories being developed in the United States. This is attributed to the space race and cold war around the launch of the Sputnik satellite by the Soviet Union in 1957. The United States invested in scientific research which led to the development of a number of learning theories.

In 1965, Robert Gagne's theory of the conditions of learning was published, and analyzed learning objectives and their relationship toward appropriate instructional designs (Gagne, 1985). Cognitivism had taken a firm root in place of behaviorism as advocated by B. F. Skinner through operant conditioning.

Albert Bandura, Jerome Bruner, Jean Piaget, Lev Vygotsky, and Robert Gagne's cognitivism approaches to learning were all being explored for possible explanations as to how learning should occur (Woolfolk, 2010)

#### 1.5 The Introduction of Television in Education

The television was invented in the 1920s but only became available to the public in the developed world after the late 1950s.

The television introduced the audio-visual experience to students and the integration of learning elements in various formats led to the enhancement of students' learning experience.

CCTV allowed customization of learning further improving the learning experience. However, the learning experience, as is the case today, was highly dependent on well-planned lessons. Televised learning was



dependent on careful design, scripting, and production.

The pedagogical approaches afforded by television include active learning, inquiry-based learning and collaborative learning.

## 1.6 Computer-Based Learning

1971 - Intel's first microprocessor was developed; a few software companies begin to develop mainframe and minicomputer-based instructional programmes. During this period, personal computers started to become more accessible. This led to the development of various educational software and computer-assisted instruction (CAI) programmes. The term "computer-based learning" was first introduced in the 1970s.

1981 - IBM developed a PC; The first educational drill and practice programs were developed for personal computers.

1990 - Multimedia PCs are developed; schools are using videodiscs; object-oriented multimedia authoring tools; Simulations, educational databases, and other types of Computer Assisted Instruction programs are being delivered on CD-ROM disks, many with animation and sound. The advent of the internet revolutionized CBL. Learning Management Systems (LMS) like Blackboard emerged, allowing for more interactive and accessible online courses. Multimedia elements such as videos, simulations, and hypertext became integral parts of educational content.



1997-2007 saw the growth of the internet as it became the world's largest of information, graphics, and video. It became an invaluable resource for educators with search engines such as Google and Yahoo constantly developing new ways to find information within the ever-growing number of web pages.

Educational software became more useful and interesting to students as graphics and video were incorporated. Larger computer storage capacity and the growing prevalence of CD-ROM and DVD drives in personal computers made it easier for educators to store large graphic video and sound

files for educational applications.

Web 2.0 was launched in 2004 and brought with it a change in the way of thinking, design and using the Internet, was supported by new technologies. Information was generated directly or indirectly by users and shared by the sites. The pillars were the technologies, social networks, content syndication, Web services and software services.

The rise of Massive Open Online Courses (MOOCs) and advancements in artificial intelligence have further transformed CBL. Platforms like Coursera and edX offer courses from top universities to a global audience. AI is now used to personalize learning experiences and provide real-time feedback.

Web 2.0 pedagogical affordances include:

- Enabling students use of the web to create content.
- Students' change from consumers to producers of knowledge.
- Enabling student collaboration and interaction with peers and instructors.
- Active learning.
- Social media usage for teaching and learning.
- Supporting higher-order skills development in students.

#### 1.6.1 Mobile Learning

As an offshoot of Computer Based Learning, Mobile learning brings with it the following affordances if appropriately applied:

- Audio-visual Affordances.
- Audio-rich Language Learning.
- Location Awareness (GPS).
- Contextual Learning (*in situ*).
- Simulations and Serious Games.
- Augmented Reality.
- Formal and Informal Learning.
- Personalised Learning.
- Rhizomatic Learning.
- Publishing and Sharing.

## 1.7 The Fourth Industrial Revolution and ODeL



Human development is marked by great technological innovations throughout history. The great innovations that changed the course of human existence are classified as industrial revolutions. The first being the invention of the steam engine, with the resulting industrial and urban labour growth. Electricity, steel and oil marked the second industrial revolution, the digital revolution and expansion of technology was the third and the Fourth Industrial Revolution (4IR) is marked by the blurring of lines between physical, digital and natural spheres (cyber-physical domain) (Vander Ark, 2017). With the advent of 4IR characterised by

Artificial Intelligence (AI), machine learning, autonomous vehicles, robotics, 3D printing, nanotechnology, as well as the Internet of Things (IoT), the higher education landscape is positioned in a space that is highly susceptible to global changes evident today. These technological changes have led to alternative definitions of work, and have great impact on the world of work in which graduate students live, work and relate with each other and the world.

4IR is characterised by the following:

- Artificial intelligence
- Machine learning
- Internet of things
- Autonomous vehicles
- Robotics
- 3D printing
- Nanotechnology

- Alternative definitions of work

More details regarding the use and applications of 4IR in ODeL will be published as future Open Educational Resources.

*Photographic images are generated by Freepik AI unless otherwise stated.*

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