BLOCK V:
EMERGING TRENDS IN EDUCATIONAL TECHNOLOGY

Unit 1 : Virtual Reality in Education

Unit 2 : EDUSAT and INFLIBNET

Unit 3 : Gamification in Education and SLEs

Unit 4 : E-Learning Tools and M-Learning

Unit 5 : CML and CAE

Unit 6 : OER, MOOC, NPTEL, SWAYAM

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UNIT- 1
VIRTUAL REALITY IN EDUCATION

Unit Structure:

1.0 Introduction:

The current world demands technology in almost every field of our lives. It touches everyday routine of people. New innovations and developments have been possible today due to science and technology. Virtual reality is one of the innovations of technology. It is a high-end user interface that involves real-time simulation and interactions through multiple sensorial channels. In fact virtual reality is a perception of being physically present in a non-physical world. It engrosses total learning environment by the use of images, sound or other stimuli. With the advent of 21st century and rapid advancement of computer technology Virtual Reality in education is taking its prominent place. Besides, Flipped classroom and blended learning are also some technologies that help education grow with time creating congenial environment for learners to learn effectively.

1.1 Objectives:

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After going through this unit, you will be able to understand–

- the meaning of Virtual Reality in Education,
- the advantages of Virtual Reality,
- the disadvantages of Virtual Reality,
- the meaning of Flipped Classroom,
- the advantages of Flipped Classroom,
- the disadvantages of Flipped Classroom,
- the meaning of Blended Learning,
- the advantages of Blended Learning,
- the disadvantages of Blended Learning.

1.2 Virtual Reality in Education:

Virtual Reality in education is gaining momentum in the present globalized world. It is a computer-generated environment which compels user interaction. This virtual environment has become an inseparable mode in education today. Virtual reality in education provides scope for engaging and inspiring students in a unique way. It improves students' learning by providing them with real learning experiences within the classroom itself. Virtual reality in Education provides benefits to students with innumerable better ways of reading and writing. VR encourages creative thinking among the students, provides experiences through extraordinary locations, within the classroom.

1.2.1 Advantages of Virtual Reality:

- Virtual reality creates a realistic world.
- It helps students to experience entirely new slide of training.
- It makes education easier and comfortable.
- Virtual Reality helps encountering high quality visualization.
- It helps students to experiment with an artificial environment.

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1.2.2 Disadvantages of Virtual Reality:

- Virtual Reality got some functional issues.
- It can damage the relation between students and overall human communication.
- Students may get addicted to virtual reality and forget other modes of learning.
- Poor people may find it difficult to have access and experiment such an advanced and costly technology.
- It is only an interaction or communication between the user and software and nothing else.

Despite the disadvantages, Virtual Reality in Education drags attention of students more as compared to traditional classroom teaching methods. Students can achieve incredible travel experiences of distant places of learning even without leaving the classroom that saves time and money. Virtual reality in education is inclusive in nature which ensures memorable educational experiences.

STOP TO CONSIDER

Virtual Reality in Education engrosses total learning environment by the use of images, sound or other stimuli.

CHECK YOUR PROGRESS

Que.1: What is Virtual Reality in Education?

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Que.2: Point out some advantages of Virtual Reality in education.

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1.3 Flipped Classroom:

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The word Flip means to turn over. Flipped Classroom refers to a turn or reverse of the activities in the class. In this system class activities are to be performed outside classroom environment and home activities of students are to be brought into the classroom. In other words what is traditionally done in the class is now done at home. And what is done at home can be done in the classroom. Flipped Classroom is a pedagogical approach which delivers instructional content, outside the classroom. Activities like projects, assignments, home work etc., are moved into the classroom. Flipped classroom encourages student-centred learning, collaboration and a sense of ownership for learning. This system of classroom is easily accessible as it provides scope to explore the lessons or contents. The primary goal of a flipped classroom is to provide a platform of learning to students where they can enhance the curriculum by better understanding the topics through group work.

1.3.1 Advantages of Flipped Classroom:

- Flipped Classroom improves learning performance.
- It provides flexible and increased learning interactions.
- It enhances student satisfaction, enjoyment and engagement.
- It facilitates individualized learning.
- Flipped Classroom provides efficient and reusable sources of learning.
- It has scope for student controlled learning with cost-effective implementation.
- It provides more time to explore the content.

1.3.2 Disadvantages of Flipped Classroom:

- It can create a digital divide.
- Flipped Classroom is dependent on technology, preparation and trust.
- It requires greater levels of self-discipline.
- It is resistant to change and takes time to adjust the move from a passive learning style to active ones.

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- Teachers have to work extra for preparation of teaching-learning contents.
- Students may be forced to spend time in front of the screen.
- Students might not get engaged in this mode of learning.
- It may be an online distraction and decrease in human element.

Students in a flipped classroom watch an online lecture, review online course material, read physical or digital texts participate in an online discussion and also perform research at home. On the other hand at school the students perform skill practice, face-to-face discussion with peers, station learning, debate, lab experiments, presentations, peer assessment etc. However Flipped Classroom does not succeed much due to its time consuming nature. Lack of technology, dearth of teacher training, replacement of teacher, unrealistic expectations cause problems in its way.

STOP TO CONSIDER

Flipped classroom encourages student-centred learning, collaboration and a sense of ownership for learning.

SELF ASKING QUESTIONS

Que.3: What is Flipped Classroom?

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Que.4: Mention an advantage of Flipped Classroom.

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1.4 Blended Learning:

Blended learning is a new mode of teaching-learning process involving both face-to-face and online learning. It is an approach that combines multiple learning environments and activities for a certain group

along with web based or electronic sources to the traditional learning. Blended learning tools include short lectures, case studies, role play, multi-media presentation and review, experiential Indoor/ Outdoor activities, scenario thinking, group discussion and presentation, self-assessment tool. According to Alex Hernandex, "Blended instruction combines the best of empowering technology and human touch so we can help each student learn more than ever."

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1.4.1 Advantages of Blended Learning:

- Blended Learning provides freedom to students to study when and how they want.
- It tailors learning experiences to each student's unique requirements and preferences.
- It provides increased engagement and improved retention.
- It is very accessible, cost-effective and collaborative.
- Students can learn at their own paces and track their learning progress easily and give feedback.
- Blended Learning assists students to develop critical technology skills effective in both academic and professional settings.
- This learning is very common and useful in higher education that makes the students more equipped for their future academic and professional pursuits.

1.4.2 Disadvantages of Blended Learning:

- Blended Learning requires reliable internet access and functional technology that may be a problem to students.
- There may be limited individualized feedback from instructors.
- It requires self-motivation and discipline on the part of the students.
- It can reduce the amount of interaction between students and teachers.
- This learning system may distract students easily through social media, gaming etc. and negatively focus on their productivity.
- It may lead to feelings of isolation and disconnection for those students who strive to learn through online mode.

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- This learning may give inconsistent learning environment due to variability in teacher practices and technological limitations.

Blended learning being a formal educational program helps students to achieve better experiences and academic outcomes. It involves a mixture of delivery modes, teaching approaches and learning styles. It effectively integrates information and communication technologies into designing course. Additional courses, flexibility, scheduling, variety of experiences, use of technology, personalized learning are some of the benefits of Blended learning. According to a report by the Inn sight Institute, there are six major types of blended learning-face-face driver, rotation, flex, online lab, self-blend and online driver.

STOP TO CONSIDER

Blended learning is a new mode of teaching-learning process involving both face-to-face and online learning.

CHECK YOUR PROGRESS

Que.5: Define Blended Learning.

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Que.6: Point out some disadvantages of Blended Learning.

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1.5 Summing Up:

- With the advent of 21st century and rapid advancement of computer technology Virtual Reality in education is taking its prominent place.
- Virtual reality in education provides scope for engaging and inspiring students in a unique way.

- It can damage the relation between students and overall human communication.
- Flipped Classroom is a pedagogical approach which delivers instructional content, outside the classroom.
- It can create a digital divide.
- Blended learning is a new mode of teaching-learning process involving both face-to-face and online learning.
- This learning system may distract students easily through social media, gaming etc. and negatively focus on their productivity.

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1.6 Questions and Exercises:

1. Write the meaning of Virtual Reality in Education.
2. State some advantages of Flipped Classroom.
3. Define Blended Learning.
4. Mention the disadvantages of Blended Learning.

1.7 References and Suggested Readings:

- A. Steed and S. Julier. *Design and Implementation of an Immersive Virtual Reality System based on a smartphone platform*. In Proceedings IEEE Symposium on 3D User Interfaces, 2013.
- Sharma Shweta (2023) *Blended Learning Advantages and Disadvantages*.
- Traxler, J. (2009) *Learning in a Mobile Age*. International Journal of Mobile and Blended Learning, 1 (1), 1-12, January-March 2009.
- Y. Akatsuka and G. A. Bekey. *Compensation for end to end delays in a VR system*. In Proceedings IEE Virtual Reality Annual International Symposium, 156-159, 1998.

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UNIT- 2

EDUSAT AND INFLIBNET

Unit Structure:

2.0 Introduction:

In the current world of rapid globalization and digitalization there are many training courses that can be attended from a distance with different types of technology and tools. At present the advanced types of courses are e-learning. Here the students can avail the content of courses through the Internet, stream the lectures using Internet and also have interaction with teachers on a specified date. EDUSAT based training follows more or less e-learning method and provides direct interaction with the teacher or expert when the lecture is delivered using EDUSAT satellite communication. INFLIBNET also being a part of the e-learning runs a nationwide high speed data network connecting university libraries and other information centres.

2.1 Objectives:

After going through this unit, you will be able to:

- *understand* the meaning of EDUSAT,
- *understand* the meaning of INFLIBNET,
- *know* the objectives of INFLIBNET.

2.2 EDUSAT:

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EDUSAT is a satellite fully developed for the purpose of education. EDUSAT is a combination of two words-EDUCATION and SATELLITE. Hence it means education through satellite. EDUSAT was launched into the space on 20th September 2004 by Indian Space Research Organization (ISRO). It enhances distance education in the country especially in medical technical & higher education system. It is used at all levels of education, right from primary schools to higher levels of education along with professional courses covering all geographical area. It facilitates quality, equality in education along with provision of lectures from various experts and meets the demand for an interactive satellite based distance education. EDUSAT is designed for an audio visual medium employing a digital classroom interaction and use of multimedia.

EDUSAT is a culmination of India's determined efforts to launch an exclusive educational satellite.

- This exclusive satellite for education will overcome the dearth of quality teachers.
- Science classes and laboratory experiments too can thus be beamed from virtual classes.
- A single lecturer can reach 10,000 students at the same time.
- The lecture can be stored as a computer file and the student can access according to their convenience Audio CD can also be made if necessary.
- EDUSAT is used for teaching learning process.

EDUSAT is basically meant for providing connectivity to school, college and higher levels of education and also to support non-formal education including developmental communication. EDUSAT employs virtual classroom in rural areas, online teaching, video programmes, Television or Radio Broadcasting, exchange of data, video conferencing, audio conferencing, computer conferencing, web based education to meet the demands of distant learners. EDUSAT offers opportunities for using satellite for human development in general and for education in particular. EDUSAT can be used for:

a) Conventional Radio and Television broadcasting.

b) Interactive Radio and Television (phone-in, video on demand.)

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c) Exchange of Data.

d) Video conferencing, Audio conferencing & Computer conferencing.

e) Web based education.

EDUSAT is thus beneficial to students due to the advantages like availability of expert or trained teachers, use of educational movies, broadcast of many useful programs for health, environment, family planning etc. EDUSAT is a two-way communication process that creates a stress free learning environment which increases learning capacity of students. However EDUSAT has certain disadvantages such as interruption due to bad weather, delay in sending and receiving data through satellite etc.

STOP TO CONSIDER

EDUSAT is a combination of two words-EDUCATION and SATELLITE.

CHECK YOUR PROGRESS

Que.1: When was EDUSAT launched into the space by Indian Space Research Organization (ISRO)?

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2.3 INFLIBNET:

INFLIBNET refers to Information and Library Networks. It was established in April 1991 by UGC. It became an autonomous Inter-University Centre (IUC) in May 1996. It is situated at Gujarat University Campus Ahmadabad. The goal of INFLIBNET is to improve the library and information centres in the country. It enhances speedy and efficient communication among academicians and researchers. Its major activities include e.g Pathshala, IndCat, INFOPORT, NLIST, OJAS, Research Project, SOUL 2.0, ShodhGanga, E-Shodh Sindhu, Vidwan Database. INFLIBNET promotes automation of libraries in educational institutions,

creates digitalization and content in e-format. It develops experts in digital content creation, process of digitalization and managing digital repositories.

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2.3.1 Objectives of INFLIBNET are as follows-

1) To establish gateways for online access to knowledge.
2) To provide access to peer-reviewed scholarly electronic resources.
3) To provide document delivery service by enriching information sources of libraries in specific subject areas.
4) To evolve a national network, interconnecting various libraries and information centers in the country.
5) To promote open access digital repositories in universities.
6) To improve capability in information handling and service.
7) To strengthen educational institutions with value added services.
8) To develop tools and techniques to access information anywhere and anytime.
9) To enable users to have access to information regarding books monographs, theses, non-book materials etc. irrespective of location and distance.
10) To evolve standards and uniform guidelines in techniques.

INFLIBNET is thus a very effective source of providing access to large information resources to users all over the country. It links all libraries belonging to universities, colleges, laboratories and other national information centres.

STOP TO CONSIDER

INFLIBNET refers to Information and Library Networks. It was established in April 1991 by UGC.

SELF ASKING QUESTIONS

Que.2: What is the goal of INFLIBNET?

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2.4 Summing Up:

- EDUSAT was launched into the space on 20th September 2004 by Indian Space Research Organization (ISRO).
- EDUSAT is a two-way communication process that creates a stress free learning environment which increases learning capacity of students.
- The goal of INFLIBNET is to improve the library and information centres in the country.
- INFLIBNET enables users to have access to information regarding books, monographs, theses, non-book materials etc. irrespective of location and distance.
- It links all libraries belonging to universities, colleges, laboratories and other national information centers.

2.5 Questions and Exercises:

1. Why is EDUSAT designed?
2. For what can EDUSAT be used?
3. What are the major activities of INFLIBNET?
4. Is it true that INFLIBNET evolves standards and uniform guidelines in techniques.

2.6 References and Suggested Readings

- Behera P. A., EDUSAT and its Utilisation
- Bhatia BS Dikshit HP (2004). Edusat: *A dedicated satellite communication for National and State Level Education*, A paper presented at the state education secretaries Meeting organized by MHRS, New Delhi.
- Garg, M. And Jindal , K.M. (2009). EduSat-E-learning Trough Satellite-Reaching the Unreached. Pub. International Journal of Recent Trends in Engineering, Vol 1, No.2.

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UNIT- 3

GAMIFICATION IN EDUCATION AND SLEs

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Unit Structure:

3.0 Introduction:

In recent years, the teaching methods in the education system have evolved and almost all higher institutions use e-learning platform to deliver courses and learning activities. However the desired objectives might not have been achieved due to lack of student motivation and engagement. In such cases Gamification and Smart Learning Environment (SLEs) play significant roles to make the students involved in learning process. The right combination of game elements by the game designers for educational purposes can stimulate learners' involvement in the course. The Smart Learning Environment (SLEs) also adds motivation in the learning of the courses effectively by the students. SLEs provide students everything they need integrated in one place, with a structure and a logical sense. It offers learning flexibility, effectiveness, efficiency, engagement, adaptivity and reflectiveness.

3.1 Objectives:

After going through this unit, you will be able to:

- *understand* the meaning of Gamification in Education,
- *understand* the meaning of Smart Learning Environment (SLEs),
- *identify* the characteristics of SLEs.

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3.2 Gamification in Education:

According to Kapp (2012), "Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems." Thus gamification in education means the use of game mechanics and elements in educational environment. Gamification is the use of game design in what is typically considered non-game environments as the classroom. Some of the examples of gamification in Education are as follows-

a) A challenge or activity with more than one way to be solved.

b) Grading by adding points.

c) A teacher giving badges instead of grades.

d) Tracking the progress of students in a fun /visual way.

e) Avatars or Role-playing.

f) Promoting levels of learning, status through interesting competitions, quizzes.

This mode is very interesting specially, for the small children. In this mode the learners learn spelling, name of places, general knowledge, problem-solving skills etc. through playing various games opposite to the computer. Gamification in education helps in setting clear goals and objectives, offers immediate feedback, provides personalized learning, motivates students learning, encourages collaboration and competition, creates a positive learning environment, and overall enhances opportunities in learning. Bringing education and game elements together may lead to results that are very significant for developing 21st century skills. Gamification in education is not only beneficial for students but also for teachers. It provides teachers with better tools to guide and reward students through joyful learning environment. While designing gamification in education the designers must take care of projects that focus on real challenges of schools. Teachers must define students' characteristics in order to determine whether the new tools and techniques would be suitable. They also need to define the learning objectives, create educational contents and activities for gamification, and add game elements and mechanisms.

In this rapidly changing world gamification in education is sure to become a part of students' lives. Therefore gamification in education requires special attention to utilize the energy, motivation and potential of the game-play. Appropriate direction of game-play will encourage learners to become winners in real life situations too.

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STOP TO CONSIDER

Gamification in education means the use of game mechanics and elements in educational environment. Gamification in education requires special attention to utilize the energy, motivation and potential of the game-play. Appropriate direction of game-play will encourage learners to become winners in real life situations too.

CHECK YOUR PROGRESS

Que.1: State an example of Gamification in Education.

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3.3 Smart Learning Environment (SLEs):

An environment that provides the use of innovative technologies with learner centred flexibility, adaptation, engagement and feedback is called Smart Learning Environment. SLEs are very comprehensive in nature as they call for efforts from different fields such as psychology, pedagogy, education, computer science and engineering. SLEs can fulfil the current educational needs or demands of learners. Teaching and learning have become easy with increased learner engagement. Teachers are the leading elements of SLEs who act as facilitators and support faculty development.

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3.3.1 Characteristics of SLEs:

1) SLEs provide access to information and the ability to add or modify that information.

2) They enable the learners to perform a task with the required or necessary tools and information.

3) They maintain and make use of learner's profile to provide appropriate support and knowledge.

4) The design of SLEs is based on personalized learning.

5) Learning community, teaching community, learning ways, learning resources, teaching ways, intelligent tools are the elements of SLEs.

6) In SLEs sensor technology is provided to the learners with a comfortable physical environment in learning. SLEs are so smart that they can even monitor air, temperature, light, sound, smell other physical environment too.

7) SLEs can track the knowledge acquisition, classroom interaction and group collaboration of the learners by using various interesting modes of technology.

8) SLEs are able to recognize learning time, learning place, learning peers and activities.

9) They are great platforms of connecting learning community through interactions and exchange of ideas on prominent aspects of learning.

10) SLEs use digital resources, specialized tools and miniaturized tools for effecting learning communication among learners and teachers.

The SLEs are great sources of learning in the current era of digitalization. Every now and then we are associated with the digital world. With the inclusion of intelligent tools, modern teaching learning ways and methods SLEs serve the educational needs of the young generation.

STOP TO CONSIDER

SLEs can fulfil the current educational needs or demands of learners. The design of SLEs is based on personalized learning. Learning community, teaching community, learning ways, learning resources, teaching ways, intelligent tools are the elements of SLEs.

CHECK YOUR PROGRESS

Que.2: On which learning is the design of SLEs based?

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3.4 Summing Up:

- Gamification is the use of game design in what is typically considered non-game environments as the classroom.
- Gamification in education helps in setting clear goals and objectives, offers immediate feedback, provides personalized learning, motivates students learning, encourages collaboration and competition, creates a positive learning environment, and overall enhances opportunities in learning.
- An environment that provides the use of innovative technologies with learner centred flexibility, adaptation, engagement and feedback is called Smart Learning Environment.
- They are great platforms of connecting learning community through interactions and exchange of ideas on prominent aspects of learning.
- The design of SLEs is based on personalized learning.

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3.5 Questions and Exercises:

1. Define Gamification.
2. How does gamification help in education?
3. Who are the leading elements of SLEs that act as facilitators and support faculty development?
4. What can SLEs track in the learning process?

3.6 References and Suggested Readings:

- Chin, K. W. (1997). *Smart Learning Environment Model For Secondary Schools in Malaysia: An Overview*.(2011. 10. 10).
- Mikulecky, P. (2012). *Smart Environments for Smart Learning.* DIVAI 2012, 213-222.
- Palfrey, J., and Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives.* New York: Basic Books.
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass Inc Pub.

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UNIT- 4

E-LEARNING TOOLS AND M-LEARNING

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Unit Structure:

4.0 Introduction:

People today are totally dependent on the Internet to find answers to their queries rather than going through the books or asking someone. This has led to the importance of E-learning and M-learning. In the E-learning process knowledge can be shared through various channels viz; e-books, CDs, webinars and many more. E-learning has brought learners, tutors, experts, practitioners and other interested groups to one place. The e-learning tools are basically of three types-Curriculum tools, Digital Library tools and Knowledge representation tools. M-learning enables learners to take their learning materials with them. Other than communication with friends and family, online shopping, playing games, consuming news, mobile phones are very useful mode of M-learning providing enormous opportunities for learning.

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4.1 Objectives:

After going through this unit, you will be able to—

- *understand* the meaning of E-learning tools,
- *know* the classification of E-learning,
- *understand* the modes of E-learning,
- *identify* the characteristics of M-Learning,
- *know* the advantages of M-Learning,
- *know* the disadvantages of M-Learning.

4.2 E-learning Tools:

E-learning was pioneered by Bernard Luskin. He explains "e" as exciting, energetic, enthusiastic, emotional, extended and educational. E-learning refers to electronic learning. In other words, e-learning is an innovative technique or a form of Information and Communication Technology (ICT). Its services include advance electronic information and communication media such as teleconferencing, video-conferencing, computer-based conferencing, e-mail, e-banking, e-booking, e-commerce, live chat, surfing on the Internet, video games, customized e-learning courses, web browsing, online reference libraries, etc. E-learning is the demand of today's world. Our educational system should be suitable enough to help students cope with the current technological challenges. E-learning is dynamic, individual and comprehensive. It operates in real time and often learning can be done within the fraction of time.

Most of the teachers want to create a sparking and joyful learning environment for students. But this is not an easy task. There are greater demands in a classroom. In fulfilling such demands the teachers often get frustrated. To make the classroom student centred and more interesting, E-learning is instrumental. E-learning tools help the students to be more responsive to the teaching stimuli. It is very essential to meet the challenge and potential of the students in the classroom environment. Co-operative learning is possible through the use of e-learning. Teachers who are able to

integrate e-learning technology in classroom may reorganize their roles in keeping with the changing demands of time. E-learning means the use of Information and Communication Technology (ICT) that helps in enhancing education. E-learning is basically an education via the Internet, network or standalone computer. E-learning process includes Web-based learning, computer-based learning, virtual classrooms and digital collaborations. The mediums used to learn any topic through such learning aspects are called E-learning tools. These tools are mainly divided into three types-Curriculum tools, Digital Library tools and Knowledge representation tools. They are described below-

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a) **Curriculum Tools-** Curriculum tools include instructional tools, administration tools and student tools. These tools are widely used by the teachers and students for browsing class materials, assignments, readings, projects, other necessary resources. Sharing and collaboration of discussion forums, self-testing and evaluation facilities can be accessed through curriculum tools. Web CT and Blackboard are used largely curriculum tools.

b) **Digital Library Tools-** These tools consist of numerous correct knowledge or information regarding any subject matter. The users can search, browse and discover the collections on any specific topic they want to know. These tools are store house of books or treasure of information largely useful for students.

c) **Knowledge Representation Tools-** Knowledge representation tools assist the users specially the teachers and students to visually review, capture or develop knowledge. These tools provide an active learning environment for learners.

4.2.1 Modes of E-learning:

Following are some modes of E-learning Tools:

- **E-mail-** This is an electronic service used to send and receive messages in a formatted manner through connection of Internet. It also contains images, videos, audio data which are very useful for learners and users.

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- **Google Classroom-** It is one of the digital learning tools that facilitates online classes, invites students and creates a learning environment for students including remote learners.
- **Edmodo-** It is a mobile-friendly platform that acts as a social network to connect teachers and students with the features of a virtual classroom learning environment.
- **Moodle-** The full form of Moodle is "Modular object- Oriented Dynamic Learning Environment." It is designed to have easy access for both learners and instructors. Moodle helps to create and upload learning content, deliver it to students, assess them on that content, track their progresss and recognize their achievements.
- **Online Forums-** These forums are places of public meeting through online mode. They allow students and teachers to participate in written discussions, exchange ideas, comments, questions and answers.
- **Grammarly-** It is a cloud-based typing assistant that helps learners and teachers to correct their written work errors. It ensures correct spelling, grammar, punctuation, clarity, engagement in texts.
- **Zoom-** It is an online meeting tool which allows deliberation of lectures, discussions or conduction of workshops and seminars. The teacher can teach the students by sharing the content screen while delivering lecture. It also allows large number of student engagement to join the meeting or discussion at a scheduled time.
- **Google Docs-** It is an online word processor where we can create and format documents and work with other people. As it is a cloud-based software users from any part of the world can access their documents with an internet connection.
- **Google Calendar-** It is a handy feature that helps to add notes, send text notifications, and schedule recurring reminders.
- **Google Drive-** It is a form of cloud storage that provides a secured and central location where teams working in different locations can access the files they need at any time.
- **Youtube-** It is a huge repository where users create and upload videos related to learning suitable to interests of people.

- **LinkedIn-** It is a repository of instructional videos covering multiple contents on various important fields providing personalized courses to develop the full potentialities or skills of the users.

E-learning is thus a very important and updated way of learning beneficial to all kinds of learners be it formal, informal or non-formal. This learning process can reach learners of almost every corner of the world. E-learning directly or indirectly helps to achieve the objectives of education in an innovative way.

STOP TO CONSIDER

E-learning refers to electronic learning. In other words, e-learning is an innovative technique or a form of Information and Communication Technology (ICT). E-learning tools are mainly divided into three types- Curriculum tools, Digital Library tools and Knowledge representation tools. E-learning process includes Web-based learning, computer-based learning, virtual classrooms and digital collaborations.

CHECK YOUR PROGRESS

Que.1: What does E-learning process include?

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Que.2: What is Edmodo?

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4.3 M-Learning:

According to Molenet, Mobile Learning can be broadly defined as "the exploitation of ubiquitous handheld technologies, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning." M-learning or mobile learning is a new way of online learning where learners can access benefit from any corner and any time by using their mobile devices. Students can enrol in various course

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programs, study assigned lessons, watch video lectures, attend live classes and take tests from the devices with location and schedule conditions.

4.3.1 Characteristics:

- M-learning provides concise relevant information and attracts learners' attention and retention.
- It includes newsfeed, chat function, forums or comments section for learners to interact with one another, ask questions and share their insights.
- It increases student engagement and involvement.
- It provides the users with optimal privacy.

4.3.2 Advantages of M-learning:

- M-learning provides easy access to learners with helpful learning materials whenever they need them.
- It is task-oriented and practical.
- Many lectures videos and step-by-step tutorials of M-learning help learners to develop new skills in them.
- Learners can stay connected with the learning community and instructors through peer discussions or can leave comments.
- M-learning facilitates interactive learning environment.
- It is more cost effective as compared to traditional learning settings.

4.3.3 Disadvantages of M-learning:

- Mobile learning devices can have varying storage and processing capacities that creates problems in this mode of learning.
- Poor Internet facilities in the remote areas may hinder the learning in such areas.
- M-learning can reduce training effectiveness as learners may get distracted to the use of social media.

- There is lack of common operating system and devices can become out of date quickly.
- Lack of common hardware platform makes it difficult to develop content for all.
- Wireless bandwidth is limited and may degrade with a larger number of users.

STOP TO CONSIDER

M-learning provides concise relevant information and attracts learners' attention and retention. Here learners can access benefit from any corner and any time by using their mobile devices.

CHECK YOUR PROGRESS

Que.3: Does M-Learning provides the users with optimal privacy?

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Que.4: Mention any two disadvantages of M-Learning.

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4.4 Summing Up:

- E-learning is an innovative technique or a form of Information and Communication Technology (ICT).
- E-learning is dynamic, individual and comprehensive.
- M-learning or mobile learning is a new way of online learning where learners can access benefit from any corner and any time by using their mobile devices.
- M-learning includes newsfeed, chat functions, forums or comments section for learners to interact with one another, ask questions and share their insights.
- Mobile learning devices can have varying storage and processing capacities that creates problems in this mode of learning.

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4.5 Questions and Exercises:

1. What are the different mode of E-learning tool?
2. What is LinkedIn**?**
3. Define M-learning.
4. What does M-Learning include?

4.6 References and Suggested Readings:

- Beetham, H. & Sharpe, R. (eds.) (2007) *Rethinking Pedagogy for a Digital Age*: Designing and Delivering E-Learning. London: Routledge.
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- Fallahkair, S., Pemberton, L. & Griffiths, R. (2007) *Development of across-platform ubiquitous language learning service via mobile phone and interactive television. Journal of Computer Assisted Learnin*g, 23 (4), 312-325.
- Kukulska-Hulme A. & Traxler, J. (2007) *Designing for mobile and wireless learning*.
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UNIT- 5

CML AND CAE

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Unit Structure:

5.0 Introduction:

Computer Managed Learning (CML) is an instructional delivery system through computers. The computer is used to provide learning objectives, learning resources and assessment of learner performance. The computer system provides an administrative framework through which the learner interacts for such tasks as enrolment, unit or module selection, direction to or provision of study material, assessment and feedback. Computer Aided Evaluation (CAE) encompasses the use of computers to deliver, mark and analyse assignments or examinations. It is used for student monitoring, early detection of problems, testing a broad range of topics, easing the marking load, enabling more frequent testing and many more.

5.1 Objectives:

After going through this unit, you will be able to understand–

- the meaning of Computer Managed Learning (CML),
- the meaning of Computer Aided Evaluation (CAE).

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5.2 Computer Managed Learning (CML):

In this type of instruction the computer manages the instructional process by gathering information, storing information to provide self-learning. It guides the learners to learn from different modes and sources. The computer forms some learning objectives of some topics and asks the learners to identify them. The computer instructs the learners to study some pages from some books to achieve the objectives. After this the computer puts some questions to the learners and evaluates their learning. Following this the next step includes some practical tasks that the learners are to perform. They have to perform a laboratory experiment to make learning permanent. According to Hofmeister, "Computer Managed Learning is the systematic control of instruction by the computer, prescriptions, and thorough record-keeping. CML is an electronic learning management system that allows data from tests to be analysed, providing information which can be the basis of educational decisions." CML helps both the teacher and students to follow suitable learning services by assuming every user as an individual. CML is an accessible software and relevant to the learning needs. It provides feedback to the users and helps the teachers to refine and improve the teaching method. CML assists in sharing valuable resources developed by teachers from time to time. The teaching environment can be controlled to achieve the goals of learning. However the users must be careful while using this CML as many unknown problems related to informatory materials may arise and make the users confused. CML further helps the Principals, management bodies of schools and also the Government to formulate some educational policies by collecting necessary data.

5.3 Computer Aided Evaluation (CAE):

Computer Aided evaluation is a process of evaluation of students' learning with the help of computers. It is extensively used by teaching staff and students. It is a programme which is designed to provide proper guidance to the learners as to which task has been learnt properly by the students and which tasks are learnt incorrectly. Different grades of questions are asked to the students according to the programmed textbooks and tasks related to their subject of study. The responses of the students to those

questions are evaluated through the computers already processed in the programmed learning.CAE is such a software that helps to create more suitable learning strategies at different levels and it tracks the progress of the students. The easy access of CAE makes it significant and special for the users. The computers never get tired and hence the learners can repeat the question answer process of the programmed task and get appropriate feedback and achieve mastery on a particular subject or topic. The teachers get more free time if the CAE is used for students' learning evaluation. Perhaps this evaluation may also include the evaluation of the OMR answer sheets of any competitive examination.

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STOP TO CONSIDER

In Computer Managed Learning the computer manages the instructional process by gathering information, storing information to provide self-learning.

CAE is such software that helps to create more suitable learning strategies at different levels and it tracks the progress of the students.

CHECK YOUR PROGRESS

Que.1: What is the full form of CML?

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Que.2: What is the need of CAE?

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5.4 Summing Up:

- CML is an electronic learning management system that allows data from tests to be analyzed, providing information which can be the basis of educational decisions.
- CML is an accessible software and relevant to the learning needs.

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- Computer Aided evaluation is a process of evaluation of students' learning with the help of computers.
- The easy access of CAI makes it significant and special for the users.

5.5 Questions and Exercises:

1) Define CML.
2) Mention the characteristics of CML.
3) Why is CAE designed?
4) Why CAE makes it significant and special for the users?

5.6 References and Suggested Readings:

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UNIT- 6

OER, MOOC, NPTEL AND SWAYAM

Unit Structure:

6.0 Introduction:

Open Educational Resources (OER) are teaching-learning materials that are freely available online for anyone to use. OER includes learning materials such as textbooks, virtual labs, interactive videos, audio-video lectures, animations, audio, collections of Journal Articles, digital images, software tools etc. The users of OER include Faculty/Teachers, Researchers, Students, Self-Learners, Industry personals etc. MOOC, NPTEL, SWAYAM etc. are some of the open educational resources helpful for the teachers and students.

6.1 Objectives:

After going through this unit, you will be able to–

- *understand* the meaning of Open Educational Resources (OER),
- *know* the meaning of MOOC,

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- *identify* the characteristics of MOOC,
- *understand* the meaning of NPTEL,
- *identify* the characteristics of NPTEL,
- *understand* the meaning of SWAYAM,
- *identify* the characteristics of SWAYAM.

6.2 Open Educational Resources (OER):

Generally speaking Open Educational Resources (OER) are teaching, learning and research materials in either digital form or otherwise. These resources are open and free to be used by public. These are openly licensed educational materials. They are helpful for educators, teachers, students, self-learners etc. The available educational resources in OER are lesson plans, power point presentations, full courses, course materials, textbooks, videos related to education, tests, software, quizzes, syllabi, instructional modules, simulations etc. These can be used, re-used, shared, posted and adapted. Some of the important resources helpful for the teachers and students are described below-

a) **Lesson Cast: -** It is a website where many important information and ideas related to teaching are submitted by experienced teachers and personnel. They submit ideas on lesson planning, classroom management strategies in 2 minutes 30 seconds or less. The documents are in the form of Power Point, Document, Pictures or Web Cam etc. The submitted documents are further reviewed by experts and accomplished teachers and then shared online. This website assists the teachers greatly to learn and apply the classroom management techniques practically in the classroom situation.

b) **Glogster EDU: -** This webpage or poster is created to make possible an interactive visual platform consisting audio, video, text, images, graphics, drawing, data etc. This webpage can be used for lesson planning or preparation, presentations, distance teaching and much more. The benefit of this Glogster is that it provides diversified ways to teach and it also helps in saving papers.

c) **Teacher Tube: -** In this website the teachers create and upload self ideas and videos useful for classroom. It is a safe mode to

upload and share their ideas online without any risk of inappropriate content.

d) **Story Birds: -** In this webpage there are short art inspired stories with the help of which teacher can make their classroom teaching interesting and full of life.

e) **Flashcard Machines:-** Flashcard is a card bearing information as words or numbers, on either only one side or both the sides. The teachers can create flashcards for students and make the classroom interesting.

f) **Edmodo: -** Edmodo is a networking site which helps a teacher to communicate with students online. Teachers can share or post assignments, test notifications, create polls, award grades etc. Students can check the important notifications and become updated.

g) **Bitstrips for Schools:-** Here the teachers can design own cartoon characters, write dialogues and create online comic strips to teach the students any number of subjects and topics.

h) **Kidblog:-** It is a very useful platform with advanced primary features specially for elementary and middle school students. Teachers have administrative control on the posts that are uploaded.

These resources have proved to be useful and effective in the teaching-learning process. They have benefitted both the teacher and students to build a modern technological educational environment.

STOP TO CONSIDER

Lesson Cast, Glogster EDU, Teacher Tube, Story Birds, Flashcard Machines, Edmodo, Bitstrips, Kidblog are some of the very useful resources which the teachers and students can avail.

SELF ASKING QUESTION

Que.1: What is Edmodo?

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6.3 MOOC:

The first MOOC experiments in India took place in 2012 with a course offered by Dr. Gautam Schroff of Tata Consultancy Services (TCS) and an adjunct faculty at Indian Institute of Technology (IIT), Delhi. The word MOOC was coined by Dave Cormier in 2008, from the University of Prince Edward Island. MOOC stands for **Massive Open Online Course**. It is an online course which basically emphasizes on 3A's-Anytime, Anyone and Anywhere. The meaning of MOOC can be given as follows-

- Massive means it includes large enrolment of learners at a time.
- Open means it is free of cost and requires no pre-requisite qualifications.
- Online means it is digitally available to the learners.
- Course is a syllabus to be studied.

There are certain categories of MOOC such as Distributed Online Collaborative Courses (DOCC), Big Open Online Courses (BOOC), Micro Credentials MOOCs, Blended MOOCs, Vocational Open Online Courses (VOOC), Transfer MOOCs, Nano Open Online Courses (NOOCs), Asynch MOOCs, Adaptive MOOCs, Corporate MOOCs, Foreign Language Open Online Course (FLOOCs), Synchronous Massive Online Courses (SMOC), Small Private Online Courses (SPOC) etc.

There are four essential elements of MOOC. They include Autonomy, Diversity, Openness and Interactivity. Autonomy refers to participation of students according to their own decision. Diversity means learners belong to different geographical and social backgrounds. Openness refers to free participation of anyone, anywhere, anytime. Interactivity means students chat, network socially, collaborate and meet digitally through meetings and discussions.

6.3.1 Characteristics of MOOC:

- MOOC is a huge website where interactive courses are designed and offered.
- The platform of MOOC includes SWAYAM, MooKIT, nptel, Udemy, Coursera, Edx, Canvas, Udacity, and Fututure Learn.

- The courses of MOOC are offered by various esteemed Universities, Colleges, Institutions, NGOs, Teachers and Experts from any corner of the world.
- The courses offered through MOOC are valid and are available in India along with many countries of the world.
- The minimum requirements to join a MOOC course are PC/Smart phone, Internet, Willingness.
- The required technical skills to join a MOOC course are- knowing how to access Internet, how to download and read files, play videos, chat, access links, routine trouble shooting.
- Most of the courses in MOOC are free however some courses require fees depending on the terms and conditions of a specific course.
- The admission, learning, evaluation etc. all processes are done through online mode by some app or website.
- No minimum qualification is required to join a MOOC Course.
- Some of the subjects offered in MOOC are Teaching, Engineering, tourism, management, law, cyber security, humanities etc.
- Learning Material in MOOC is provided through E-books, Websites, Blogs, Videos, Podcasts, Links, Online Tests

Some of the limitations of MOOC include non-availability of courses in local languages, short courses are more popular rather than long term courses, most of the courses are in English language.

MOOC has a significant importance in the present digitalized world. It is easily accessible and engages a large number of students from all corners of the world through discussion forums. Learners can select courses according to their choices, learn at their own pace by watching and re-watching the lecture videos. Participants interact with each other and improve their life-long learning skills. Immediate feedback is possible in this platform. Willingness on the part of the learners is a basic factor to learn through MOOC rather than any degrees.

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STOP TO CONSIDER

MOOC stands for Massive Open Online Course.

The four essential elements of MOOC include Autonomy, Diversity, Openness and Interactivity.

SELF ASKIG QUESTIONS

Que.2: Mention the categories of MOOC.

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6.4 NPTEL:

The full form of NPTEL is **National Programme on Technology Enhanced Learning** (NPTEL). It is basically designed to provide quality education to people across the country. Providing curriculum based video and web courses are also the aims of this learning system. NPTEL is a project funded by Ministry of Human Resource Development (MHRD). It was first conceived in 1999 to introduce multimedia and web technology to enhance learning of basic science and engineering concepts. It offers self study courses across engineering, humanities and science streams. The NPTEL emphasizes on higher education, professional education, distance education, continuous and open learning.

6.4.1 Characteristics of NPTEL:

- More than 900 courses are available across Disciplines.
- The learning modules are of a shorter duration.
- Users include all from every corner of the world out of which 80% is from India.
- There are 240 million website views in NPTEL.
- NPTEL is the most visited academic You Tube channel in the world.

- Web courses of NPTEL include PDF, html files, lessons in the text format, files with animation, equation, diagrams etc. These are available for download too.
- NPTEL provides learning opportunities to people at anytime and anywhere.
- It provides information about upcoming courses.
- Through NPTEL students get motivated by fellow students and group work.

NPTEL is currently being widely used all over the world. This is due to its easy accessibility among learners. NPTEL makes video lectures in an appropriate format for broadcasting that would provide quality content through the technology channel. It is a supplement of classroom teaching as it makes e-learning material available in the web for the video lectures.

STOP TO CONSIDER

NPTEL is a project funded by Ministry of Human Resource Development (MHRD). NPTEL emphasizes on higher education, professional education, distance education, continuous and open learning.

SELF ASKING QUESTIONS

Que.3: Is it true that through NPTEL students get motivated by fellow students and group work?

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6.5 SWAYAM:

SWAYAM was launched by Shri Pranab Mukherjee on 9th July 2017 in India. SWAYAM stands for **Study Webs of Active Learning for Young Aspiring Minds**. It is regarded as the national MOOC platform of

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India. Access, equity and quality are the three pillars of this program. Swayam hosts courses from class 9th to Post Graduation level covering all disciplines. It aims to provide Internet Cloud and sufficient bandwidth for concurrent viewings of 1 Million users. This digital platform conducts examination and awards certificates to participants having successfully completed the course. The vision of SWAYAM is to host more than 10000 online courses for 30 million learners starting from 9th Class till post-graduation. It aims to improve gross enrolment ratio (GER) and bring all educators and leaders to this platform. Creating awareness on digital education system in India is also an objective of this program.

SWAYAM is conducted through various approaches including e-Tutorial videos, audio contents, video demonstration, documents and interactive simulations, animations, virtual labs, web resources links, open content on internet, case studies, anecdotal information, historical development of the subjects, Articles, e-Contents, e-books/PDF/illustrations, Problem quizzes, Discussion forums self-assessment containing MCQ., Assignments and solutions, Peer group interaction,. SWAYAM is thus a very reliable digital platform where thousands of MOOC courses are available by best teachers from prestigious institutions.

6.5.1 Characteristics of SWAYAM:

- SWAYAM provides accessible mobile learning.
- The courses on the platform are available in the audio-visual multimedia format.
- It keeps track of the progress and issue a certificate for the students after an online exam.
- The learners in SWAYAM can have Interaction forums and clear their doubts.
- The courses of SWAYAM are designed by renowned and expert professors and faculties of Universities.
- The courses offered in SWAYAM are free of cost.

STOP TO CONSIDER

- SWAYAM stands for Study Webs of Active Learning for Young Aspiring Minds.
- SWAYAM is a very reliable digital platform.

SELF ASKING QUESTIONS

Que.4: State the approaches of SWAYAM.

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6.6 Summing Up:

- Open Educational Resources (OER) are teaching, learning and research materials in either digital form.
- The available educational resources in OER can be used, re-used, shared, posted and adapted.
- MOOC is easily accessible and engages a large number of students from all corners of the world through discussion forums.
- NPTEL is basically designed to provide quality education to people across the country.
- NPTEL users include all from every corner of the world out of which 80% is from India.
- The vision of SWAYAM is to host more than 10000 online courses for 30 million learners starting from 9th Class till post-graduation.

6.7 Questions and Exercises:

1. What are the available educational resources in Open Educational Resources (OER)? 2.What is Teacher Tube?
2. What are the four essential elements of MOOC?
3. On which aspects does the National Programme on Technology Enhanced Learning (NPTEL) emphasize on?
4. What is the main aim of Study Webs of Active Learning For Young Aspiring Minds (SWAYAM)?

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6.8 References and Suggested Readings:

- Bates, T. (2014B, April 11). Contact North on Online Learnng, Innovation, Flexibility and Open Educational Resources.
- Clinton, V. (2019). Cost, Outcomes, Use and Perceptions of Open Educational Resources in Psychology: A Narrative Review of the Literature. Psychology Learning &Teaching, 18 (1), 4-20.
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