UNIT 4

DIGITAL EXPERIENCES

SIMULATION AND VIRTUAL LEARNING WITH MOODLE

E-PUBLISHING CONCEPT

Electronic Publishing or e-Publishing can be defined as the process that makes use of Informationand Communication Technology (ICT) to deliver information products electronically to its users.

E-publishing is helpful in producing documents containing text, static or dynamic pictures, graphics, audio, video, and graphs. tables or a combination of any or all of these with the assistance of the Data Processing System. Nowadays, e-publishing has become more and more common to distribute books, journals, magazines, and newspapers to readers through tablet reading devices. There are non-network electronic publications such as reference publications such as encyclopedias and reference publications relied on by most users. Today however network distribution is strongly associated with electronic publishing. Electronic publishing does not generate a hard copy, unlike Desktop publishing.

The electronic publishing follows a traditional publishing process but differs from traditional publishing in two ways:

- It does not include using an offset printing press to print the final product.
- It avoids the distribution of physical products, this is because the content is electronic and it maybe distributed through electronic bookstores. The users may read the published content on any website or on an application tablet device or even as a pdf on a computer.

Advantages of Electronic Publishing

- o Electronically published documents can be sent all over the world in a matter of seconds, which isa huge advantage to both reader and writer who does not like to wait.
- o Accepted manuscripts may get published faster. This method generally publishes work within afew weeks to a few months after acceptance.
- o More flexible within the writer-publisher relationship. Electronic publishing affords more say towriters in preparing work for publication.

o Writers can update the text whenever required and with much ease at virtually no cost. This is specifically helpful for works related to fast-moving industries, such as computer technology. Since the publisher does not have any investment in printed books already lining shelves, texts can be electronically updated in seconds.

o E-publishing often has a longer life with slower sales. While paper publishers will remove slowmovers from active status (print) electronics storage afford unlimited archiving.

o Works published electronically have an ISBN number, just as printed books. This means anyonecan walk into a bookstore and order an electronic copy of the book.

Disadvantages of Electronic Publishing

o With e-publishing writers normally retain all other rights to the work, such as the option to go to the paper publisher later, adapt a screenplay, or use the work in some other capacity.

o Some might argue that the quality of writing of an e-published document doesn't compare to that of paper documents. Many people aren't aware of e-publishing and others prefer reading a document from print rather than electronically.

o Writers are typically responsible for providing their own ongoing marketing for e- published work.A book might be good, but if nobody knows about its content, it won't sell. Authors also can't count on the public seeing their documents on shelves or in store windows.

o Electronically published works do not always carry the same weight as traditional paper publishers. This may vary with time, however, as the industry becomes more established.

o Writers don't receive anything in advance. This is not just a financial disadvantage but might disqualify e-published authors from participating in certain organizations where membershiprequirements include works paid by advance.

o Prices are not always significantly cheaper for e-documents, despite the lower overhead. Thismight be a deterrent to sales.

Types of E-Publishing

Many people associate digital publications with e-books. But e-books are not the only type ofdigital publication; there are many others.

Electronic publishing, or e-publishing, encompasses various types of digital content distribution methods.Here are some common types of e-publishing:

1] E-books (Electronic Books):

▪ Description: E-books are digital versions of traditional printed books. They can be read on e-readers, tablets, smartphones, and computers.

▪ Formats: Common e-book formats include EPUB, MOBI, PDF, and others.

▪ Advantages: E-books offer portability, adjustable fonts, search functionality, and the ability toinclude multimedia elements.

2] Online Magazines and Periodicals:

▪ Description: Traditional magazines and periodicals are published digitally, often in a formatoptimized for online reading.

▪ Formats: Web-based formats, digital editions (PDF or interactive), and mobile apps.

▪ Advantages: Interactive features, multimedia content, and the ability to reach a global audience.

3] Digital Newspapers:

▪ Description: Newspapers are published in digital formats, accessible through websites, apps, ordigital editions.

▪ Formats: Web-based, digital editions (PDF or interactive), and mobile apps.

▪ Advantages: Real-time updates, multimedia content, and the ability to engage readers throughcomments and social media.

4] Academic and Research Publications:

▪ Description: Scholarly articles, research papers, and academic journals are published digitally.

▪ Formats: PDF, HTML, and other web-based formats.

▪ Advantages: Accessibility, ease of distribution, and the potential for open access publishing.

5] Blogs and Online Articles:

▪ Description: Individuals and organizations publish content on specific topics through blogs andonline articles.

▪ Formats: Web-based, often integrated into content management systems.

▪ Advantages: Interactivity, ease of sharing, and the ability to reach a wide audience. Web ContentManagement System

6] Interactive E-learning Materials:

- Description: Educational materials, courses, and textbooks are created and distributed digitally.

- Formats: HTML, SCORM (Sharable Content Object Reference Model), and other e-learningstandards.

- Advantages: Interactivity, multimedia content, and the ability to track student progress.

7] Corporate and Business Publications:

- Description: Organizations publish digital content for internal and external communication,including reports, newsletters, and brochures.

- Formats: PDF, web-based formats, and email newsletters.

- Advantages: Cost-effective distribution, real-time updates, and multimedia integration.

8] Digital Comics and Graphic Novels:

- Description: Comic books and graphic novels are published digitally, often with interactivefeatures.

- Formats: Various digital formats, including comic book reader apps.

- Advantages: Multimedia integration, guided navigation, and accessibility on various devices.

9] Self-Publishing Platforms:

- Description: Authors can independently publish and distribute their works through self-publishing platforms.

- Platforms: Amazon Kindle Direct Publishing (KDP), Smash words, and others.

- Advantages: Direct access to a global audience, control over publishing process, and potentialfor higher royalties.

10] Multimedia and Enhanced E-books:

- Description: E-books enriched with multimedia elements such as audio, video, and interactive features.

- Formats: EPUB3, enhanced PDFs, and proprietary formats.

- Advantages: Enhanced reader experience, engagement, and the ability to convey information through multiple mediums.

E-PUB TOOL

- **Google Docs:** Google docs is a free word processing tool (like Microsoft Word) that allows you to write and organize your content. It offers great tools for designing and laying out your book content.It also has great sharing features that make it easy to get feedback on your book.

- **Canva.com:** Canva is a free design tool that works in your browser. Its a great way to create your cover image. It is also great for designing graphics to go in your content, ads to promote your book,banners for your social media sites and more!

- **Pexels.com:** Pexels is a stock photography and image site that offers great high quality images completely free! You can use these images for your ebook cover, chapter headings, or anything else!

- **Sigil:** Sigil is an ebook editing and creation tool that makes it easy to edit and create professionalquality ebooks.

- **Calibre:** Calibre serves as a powerful management tool for organizing, converting, and transferring eBooks between devices. Calibre is a powerful and comprehensive open-source software suite designed for managing, organizing, and converting eBooks. Calibre is an ebook conversion tool that allows you to convert files into different formats. We like this tool most for its ability to convert EPUB ebook files into MOBI ebook files.

- **KindleGen:** KindleGen is a command-line tool provided by Amazon for converting eBook files into the Kindle format. It is commonly used by publishers and authors to create eBooks that are compatible with Amazon Kindle devices and can be distributed through the Kindle Store. KindleGen is especially useful for converting EPUB files to the MOBI format, which is the preferred format for Kindle devices

- **Adobe Digital Editions:** This awesome tool allows you to open and read EPUB files on your PC orMac computer. Adobe InDesign is a professional desktop publishing software application developed by Adobe Inc. It is widely used in the graphic design and print industries for creating a variety of documents, including books, magazines, brochures, flyers, and digital publications

- **IDPF ePub Validator:** This tool allows you to upload your EPUB file and see if it passes validation. It checks to make sure all of your code is correct and gives you specific warnings if it isnot. If your book does not pass validation with the IDPF tool, it will probably not be accepted by Apple, Amazon or any of the other online stores!

SIMULATION

Definition: Simulation involves creating a computer-generated model or scenario to imitate real-world processes, systems, or situations. It allows users to interact with a virtual representation of reality.

Applications

Training and Education

- Flight Simulators: Pilots use flight simulators to practice flying in a realistic environment withoutthe risks associated with actual flight.

- Medical Simulations: Healthcare professionals can practice surgical procedures, patient care, andemergency scenarios in simulated environments.

Engineering and Design

- CAD Simulations: Engineers use computer-aided design (CAD) simulations to test and optimizeproduct designs before physical prototypes are built.

- Virtual Prototyping: Simulations help in the development and testing of products and systems,reducing costs and time.

Military and Defense

- Military Training Simulations: Soldiers train in simulated combat scenarios, improving theirdecision-making skills and readiness.

- War Game Simulations: Simulations help military strategists test different scenarios and developstrategies.

Healthcare

- Patient Simulations: Medical professionals use simulated patients to practice diagnostic andtreatment procedures.

- Clinical Simulations: Simulations aid in training healthcare workers for various clinical scenarios.

Entertainment

- Simulation Games: Simulators and games replicate real-world activities, from farming to citybuilding, providing users with an engaging and immersive experience.

Logistics and Operations

- Supply Chain Simulations: Companies use simulations to optimize logistics and supply chainoperations, improving efficiency and reducing costs.

- Business Process Simulations: Simulations help organizations analyze and optimize their businessprocesses.

VIRTUAL REALITY (VR)

Definition: Virtual reality refers to a computer-generated environment that simulates a physical presence,enabling users to interact with and navigate through this digital environment.

Applications

Gaming and Entertainment

Immersive Gaming: VR provides gamers with a more immersive and interactive gaming experience, allowing them to explore virtual worlds.

Education and Training

- Virtual Classrooms: VR is used in education to create virtual classrooms and field trips, enhancinglearning experiences.
- Corporate Training: Employees can undergo VR-based training for various scenarios, such assafety protocols or customer service.

Healthcare

- Virtual Therapy: VR is used in mental health treatments, exposing individuals to controlled virtualenvironments for therapeutic purposes.
- Medical Training: Surgeons and medical professionals use VR for realistic surgical simulationsand procedural training.

Real Estate and Architecture

- Virtual Tours: Real estate professionals use VR to provide virtual tours of properties to potential buyers.
- Architectural Visualization: Architects use VR to visualize and explore virtual models of buildingsand structures.

Social Interaction

- Virtual Meetings: VR enables users to attend meetings and conferences in a virtual space,fostering more engaging and immersive communication.
- Social VR Platforms: Users can interact with others in shared virtual spaces, playing games orengaging in social activities.

Tourism and Exploration

- Virtual Travel: VR allows users to explore and experience destinations virtually, promotingtourism.
- Space Exploration: VR can simulate space environments, enabling users to explore

celestialbodies or historical events.

Training and Simulation

Flight Training: VR is used in pilot training for realistic flight simulations.

Military Simulation: Virtual reality is employed in military training for tactical scenarios and simulations.

Corporate Training:

- Soft Skills Training: VR is employed for corporate training programs to enhance soft skills such ascommunication, leadership, and teamwork through interactive scenarios.

- Virtual Meetings and Collaboration: VR platforms facilitate virtual meetings and collaboration,providing immersive environments for remote teams.

Aerospace and Automotive Industry:

- Vehicle Design: VR is used in the automotive and aerospace industries for virtual prototyping,testing, and design evaluation.

- Driver Training: Driving simulators with VR provide a realistic training environment for new drivers and help improve driving skills.

Types of Virtual Reality (VR)

On the basis of the most important feature of VR i.e. immersion and the types of systemsand interfaces used, The VR systems can be classified into 3 types:

1. Immersive

2. Semi-immersive

3. Non-immersive

1. **Immersive VR system:** Immersive VR system is closest to the virtual environment, It makes us experience the highest level of immersion. This VR system is expensive than others. It providesthe closest feeling of being in virtual world. Tools and gadgets used in this system are advancedand not so common to use.

2. **Semi-immersive VR system:** Semi-immersive VR systems also make us to experience a highlevel of immersion but the tools and gadgets used are not so advanced and costly. Tools and gadgets used in this system are common to us and utilize physical models.

3. **Non-immersive VR system:** Non-immersive VR system is the least immersive and least immersive VR system. It is not expensive to use this system. It is also known as desktop VR system because the gadgets used are limited to glasses and display monitors and it uses the leastexpensive components.

What are the basic components for VR systems?

Input devices

Output devices

Software

1. **Input Devices:** Input devices in VR are the tools for the users to interact with virtual world. UsingInput devices, the users communicate with the computer. Example: 3D mouse.

2. **Output devices:** Output devices is used to represent the virtual world and it's effect to the users. Itgenerates the feeling of immersion to the users. Example: LCD shutter glasses.

3. **Software:** Software has a key role in VR. It is used for the handling Input and output devices, dataanalysis and generate feedback. Software controls and synchronize the whole environment.

CREATING 2D AND 3D ANIMATIONS

Definition of Animation

Animation is the process of creating an illusion of motion and shape change by means of rapiddisplay of various type of pictures that were made to create a single scene.

Principles of Animation

Before doing animation, every animator should follow these principles to create a good animation.These principles was evolved from past animation techniques but these principle are also very useful and essential for doing animation. In 1981 two bright Disney animators Ollie Johnston and Frank Thomas

Introduced twelve basic principles of animation to produce more realistic works. These principle are alsoapplicable on present computer animations.

2D Animation

Key characteristics of 2D animation include:

1) Frame-by-Frame Animation:

   In traditional 2D animation, each frame is created individually. Artists draw or digitallyillustrate each frame to produce the illusion of movement when played in sequence.

2) Tweening (In-betweening):

To streamline the animation process, some 2D animations use tweening, where keyframesare set, and the computer generates the frames in between. This technique is commonly used in digital animation software

3) Limited Perspective:

2D animation lacks the depth perception found in three-dimensional space. Characters andobjects typically move along a flat plane.

4) Hand-Drawn or Digital Illustration:

Traditionally, 2D animation involved hand-drawing each frame on paper. In modern times,digital tools and software, such as Adobe Animate or Toon Boom Harmony, are commonly used for creating 2D animations.

5) Examples:

Classic Disney cartoons like "Snow White," "The Lion King," and contemporary 2D animated series or web animations fall under the category of 2D animation.

Techniques
- Traditional Animation: Hand-drawn frame by frame animation.
- Cel Animation: Traditional animation using transparent sheets (cels) for characters and backgrounds.
- Computer Animation: Done using software, involves creating frames digitally.

Tools

Drawing Software

Adobe Animate

workflows.

Toon Boom Harmony

Clip Studio Paint

Steps in 2D Animation

1. **Storyboarding**:

    ▪ Plan your animation by creating a storyboard. This helps in visualizing the sequence ofevents.

2. **Software**:

    ▪ Choose a 2D animation software. Some popular options include:

        • Adobe Animate • Toon Boom Harmony • OpenToonz • Synfig Studio

3. **Creating Assets:**

    ▪ Design and create your characters, backgrounds, and other elements.

4. **Animation Techniques:**

    ▪ Traditional Frame-by-Frame: Draw each frame individually.

    ▪ Rigging: Create a skeletal structure for characters, making it easier to animate.

    ▪ Tweening: Define keyframes and let the software generate in-between frames.

5. **Timing and Easing:**

    ▪ Pay attention to timing and easing to make animations more natural and appealing.

6. **Sound Integration:**

    ▪ Add sound effects and synchronize them with your animation.

3D Animation

▪ 3D animation involves the creation of moving images in a three-dimensional digital environment.

▪ Unlike 2D animation, which is limited to height and width, 3D animation adds the element of depth,allowing for more realistic and immersive visual experiences.

▪ This form of animation is widely used in movies, video games, simulations, and various otherinteractive media.

Key characteristics of 3D animation include:

1) Three-Dimensional Space:

    Objects and characters in 3D animation exist in a three-dimensional space, with depth,width, and height. This allows for more realistic and dynamic movements.

2) Modeling:

    3D models of characters, objects, and environments are created using specialized software. These models serve as the foundation for the animation.

3) Rigging:

Once models are created, a process called rigging is employed. Rigging involves creating avirtual skeleton (a system of joints and bones) within the 3D model, enabling animators to manipulate and control its movements.

4) Keyframe Animation:

Animators set keyframes to define important positions and movements. The computer generates the frames in between these keyframes, creating a smooth and realistic animation.

5) Lighting and Texturing:

3D animations involve the application of textures to surfaces, and lighting is used tosimulate realistic shading and shadow effects, adding to the visual depth.

6) Rendering:

The final step involves rendering, where the computer calculates the images or framesbased on the 3D scene, lighting, and textures. This process can be computationally intensive.

7) Examples:

Animated movies like those produced by Pixar ("Toy Story," "Finding Nemo"), video games with realistic graphics, and architectural visualizations are common examples of 3D animation.

Techniques

- 3D Modeling: Creating digital 3D models of characters and scenes.
- Rigging: Adding a skeleton structure to models for movement.
- Animation: Setting keyframes and defining motion.
- Texturing and Lighting: Adding realistic textures and lighting effects.
- Rendering: Processing the final animation frames.

Tools

3D Modeling Software

Blender

Autodesk Maya

Cinema 4D

Animation Software

Maya

3ds Max

Cinema 4D

Steps in 3D Animation

1. **Storyboarding**:

   ▪ Similar to 2D animation, plan your 3D animation with a storyboard.

2. **3D Modeling:**

   ▪ Create 3D models of characters and environments using software like Blender, AutodeskMaya, or Cinema 4D.

3. **Rigging**:

   ▪ Build a skeleton or rig for your 3D characters, enabling movement.

4. **Animation:**

   ▪ Animate by manipulating the 3D models over time. Keyframes play a crucial role.

5. **Lighting and Texturing:**

   ▪ Add textures to your models and set up lighting to enhance visual quality.

6. **Rendering:**

   ▪ Render your animation frames using the chosen 3D software.

7. **Post-Processing:**

   ▪ Use post-processing tools or software to enhance the final look of your animation.

Key Differences

Dimension: 2D involves flat images, while 3D adds depth and realism.

Process: 2D often involves frame-by-frame drawing, while 3D is more about modeling and animation rigs.

Tools: Different software is used for 2D and 3D animations.

Choosing between 2D and 3D often depends on the project requirements, style preferences, and the desired visual impact. Each has its strengths and applications in various industries, from entertainmentand gaming to education and marketing.

Difference between 2D and 3D animation

2D	3D
2-D means that the object is two dimensional	3-D means that the object is 3 dimensional.
2-D is the cheapest in price as compare to 3-D.	3-D is costly than 2-D.
2-D is all about the frames of the images.	3-D is all about movements of the images.
In 2-D, images is created by the traditional drawing method	In 3-D, everything is created by computer software.
In 2-D, image is comprised by height, width	In 3-D, Image is comprised by height, width, depth.
In 2-D, image in mathematical form x-axis, y-axis	In 3-D, image in mathematical form x-axis, y-axis, z-axis.
Geometry in 2-D are Rectangle, square, triangle, polygon etc.	Geometry in 3-D are cylinder, cube, primed, spear.
It is not suitable for conceptual drawing.	It is suitable for conceptual drawing.

INTRODUCTION TO MOODLE

Modular Object-Oriented Dynamic Learning Environment (MOODLE) is an Open Source Learning Management System (LMS) that paves the way for digital learning with the system. There are over 20 types of activities that can be created as part of learning content capacity to hold various types oflearning content. It is SCORM 1.2 standard compliant design.

Key Features of Moodle:

1. **Course Management:**

   Moodle facilitates the creation, organization, and management of online courses. Instructors canstructure courses with various resources such as text, multimedia, quizzes, assignments, and forums.

2. **User Management:**

   Users, including students, teachers, and administrators, can be easily enrolled, assigned roles, and managed within the platform. User roles define the permissions and access levels for different individuals.

3. **Collaborative Learning:**

   Moodle supports collaborative learning through discussion forums, wikis, and group activities. Itencourages interaction and engagement among students and instructors.

4. **Assessment and Quizzes:**

    Instructors can create a variety of assessments and quizzes, including multiple-choice questions, essays, and interactive quizzes. The platform provides tools for grading and feedback. Web Content Management System

5. **Customization and Theming:**

    Moodle can be customized to fit the specific needs and branding of an institution. Administratorscan choose from a variety of themes or create custom themes to enhance the platform's visual appeal.

6. **Activity and Resource Integration:**

    The platform supports integration with various activities and resources, including external websites, files, multimedia content, and external tools, enhancing the overall learning experience.

7. **Open Source and Community Support:**

    Being open source, Moodle allows users to modify, adapt, and extend the software based on their requirements. A vibrant community of developers and educators contributes to ongoing improvements and support.

8. **Mobile-Friendly:**

    Moodle is designed to be responsive, providing a user-friendly experience on various devices, including smartphones and tablets, through its mobile app.

9. **Scalability:**

    Moodle is scalable and can accommodate the needs of both small classrooms and large institutions with thousands of users.

CREATING COURSES AND UPLOADING

How to create a course

There are several ways you as admin can create a course. The two most common are:

Create a new, empty course Upload an existing course from a different Moodle site.

Create a new empty course

1. Log in with your administrator account
2. Click Site administration
3. Click the Courses tab
4. Click Add a new course
5. Add your course details, using the icon helpicon.png for extra help

6. Click Save and display

7. Click Proceed to course content to add your teaching materials.

Upload an existing course

1. Make sure the course you want to upload (known as a "course backup") has the file ending .mbz.

2. Log in with your administrator account

3. Click Site administration

4. Click the Courses tab

5. Click Restore course

6. Drag in or upload your .mbz file into the space Import a backup file

7. Click "Restore" and on the next page, scroll down and click Continue

8. In the "Restore as a new course" section, click the button next to "Miscellaneous" OR click the button of the category where you want to upload your course and then press Continue

9. Click the Next button at the bottom of the next two pages.

10. Click Restore on the final page. Your course will then be displayed.