TAILORING EXTENDED REALITY (XR) INTO THE GROUNDS OF CONTEMPORARY MEDIA EDUCATION FOR EFFECTIVE-PRODUCTIVE LEARNING PROCESS

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Abstract

The Educational system of India boasted its strength during the Gurukula or Gurukulam system, where students stay along with their Guru's (teachers) to get educated by living real-life lessons of cultural-disciple (Chandwani, 2019). Learning is a process of creating and developing '… ideas buried deep in the soul' that requires perfected guidance to transmute a 'learned' idea into a 'recalled' idea (Lee, Mourelators and Rorty, 1973). The pandemic situation has completely replaced face-to-face communication with digital technologies in the academic world. The shift from a traditional classroom setup to online educational platforms is in the standard rise. Online academic platforms have become 'the need of the hour' technology to cope up with the demand for interdisciplinary knowledge skill sets. Extended Reality (XR) is a promising approach in the grounds of academia. XR is a combination of Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) used to integrate the physical environment with the virtual environment (Kaushik, 2020).

Media Education is an academic disciple that explores the aspects of teaching and learning about the ethical usage of media for social and self-development. The core purpose of this research is to transverse and investigate the application of Extended Reality (XR) in creating a new online ground for effective-productive media learning and teaching in academics. This study utilizes Social Learning Theory (Bandura, 1977) and Experiential Learning Theory (Kolb, 1984) through the conceptual framework of Interactive Taxonomy (Fisher, 2016) to analyze the tailoring of Extended Reality (XR) with Online Media Education.

1. REDEFINING EXTENDED REALITY IN MEDIA EDUCATION

Virtual Reality based education has been in application for two decades in the medical, clinical, engineering and architectural fields. Various academic experiments expose the positive sides of *Virtual Reality* in academics. Extended Reality (XR) is an umbrella term that stitches several interactive media technologies to create a unified environment that resembles Reality in terms of Virtuality. The primary purpose of Extended Reality (XR) is to compete with the real time environment to provide the users with a similar-unaltered virtual
experience. It makes use of Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) to serve this effectiveness.

Learning is a never-ending process that turns our minds to perceive an interesting and understandable subject. The process of learning becomes effective when the interaction becomes a part of it. This COVID-19 pandemic situation has distanced the process of real-time interaction creating a variation in learner's perception and understanding. There is a wide difference between Online Education and Virtual Education. Online Education is where students learn using live video calls or instructions with minimalized interaction. Whereas, Virtual Education is an advanced platform, where Extended Reality (XR) is implemented to provide a real-time experience of classroom education virtually. The teacher and learner/ student interact in a virtual space that provides a real-space experience through interactive media technology. Extended Reality (XR) holds the power to break the real-time distance and bring a classroom virtually alive through its technological devices (Pomerantz, 2019).

India is immersed into its cultural and traditional aspects, where the Gurukula or Gurukulam educational system resulted in various academic advancements dating back to 5000 BC. Gurukul (school) is the house of the teacher and students stay with their teachers for decades to learn various subjects by experiencing real human-values (Mor, 2018). Introduction of Lord Macauley's (1835) educational system lacks the aspect of 'experiencing real human-values' and 'living with the guru' as its concept is bound within four walls. The application of Extended Reality (XR) can break the concept of 'bound within four walls' by traversing the learners along with the teachers to experience human-values in recreated virtual environments. It opens a new gateway for the learners and teachers to interact and re-learn together.

Media Education is a booming academic field that addresses Film, Documentary, Photography, Journalism, Animation, Gaming, Advertisement, Public Relation, Media Marketing and Entrepreneurship etc through interactive-critical media systems. Usage of Extended Reality (XR) in the teaching-learning process of media education would equip its effectiveness through Online-Virtual mode. Learners/ Students will experience hands-on training of several media equipment through the recreated real-time environment. This research explores the application of Extended Reality (XR) in Virtual Media Education and its effectiveness through Social Learning Theory (Bandura, 1977) and Experiential Learning Theory (Kolb, 1984).

The Social Learning Theory of Albert Bandura (1977) concentrates more on the vitality of '… observation, modeling, and imitating the behaviours, attitudes, and emotional reactions of others' (Bandura and Walters, 1977). Bandura argues that the environment and cognitive factors interact with each other to influence human learning behaviour, which is a combination of Classical Conditioning Theory (Pavlov, 1897) and Operant Conditioning Theory (Skinner, 1971). The individuals or subjects that get observed are called as Influential Models in Social Learning Theory. Students are highly influenced by observing these different influential models surrounding them through media environments and real-life environments. This influence takes place through a 'mediated stimuli and response process' that can be termed as 'interaction' and learning a behaviour by closely observing a repetitive behaviour. The Experiential Learning Theory of David Kolb (1984)
defines the learning process as, '… a transformation of experience', as knowledge is an outcome of perceiving and transforming experiences (Hedin, 2010). Kolb's theory adds the concept of experience with Behavioural Learning, providing it with a holistic approach that considers cognitive, environmental and emotional factors in influencing the learning process. The past experiences create a demand in our environment that develops a preferred way of choosing the type of knowledge each individual requires (Kolb, 1984).

2. FRAMEWORKS ASSOCIATED WITH EXTENDED REALITY (XR)

The growing pandemic scenario has acted as a ground for Online Educational Platform, making it the only source of education since two years of COVID. Utilization of Extended Reality (XR) would transform this online education into a live Virtual Classroom with required experience perception and interaction. Extended Reality (XR) has its own formulated frameworks that distinguishes it from the regular media technologies. XR is an existing continuum that, '… implements interactions that capitalize' different degrees of virtuality all at once (Fisher, 2016). This Extended Reality (XR) Model is developed for this study, drawn from Venn's Diagram of Mixed Reality (MR). This study focuses on exploring the application of Extended Reality (XR) for Virtual Media Education through Film and Documentary Exposure, Gaming and Online Platforms like MOOC.

Fig 1. Extended Reality (XR) Model of Media Learning
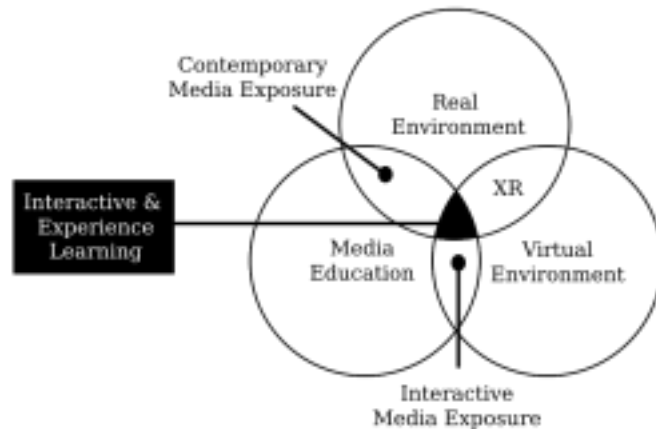
XR Model of Media Learning is a framework that illustrates the usage and effectiveness of Extended Reality (XR) in Media Education. When a contemporary Media Content is exposed to the learners in a Real-life Environment (classroom), they perceive the information and process it according to their understanding. But, when an interactive Media Content is exposed to the learners in a Virtual Environment (recreated scenario), they interact and experience the information along with the teacher through behavioural observation. The inclusion of XR technology changes the contemporary teaching methodology, resulting in a new effective learning process. Extended Reality (XR) also allows the students to choose the type of virtual media environment and virtual tools required for their effective perception.

The primary objective of this research is:

i. To study the effectiveness of XR Film and Documentary exposure in creating a new perception towards Effective Productive Learning Process.

ii. To understand the vitality of XR in teaching Media Studies through online platforms like MOOC.

iii. This study applies several literature and real-life case studies to support various XR based experiments.

3. UNDERSTANDING FILM AND DOCUMENTARY THROUGH XR

Film and Documentary studies are a major part of Media Education, which opens the doors to explore the unseen and untouched lives through screens. Teachers and learners interact with one another, reflecting on the screen visual and images. The inclusion of Extended Reality (XR) would serve much more effectiveness, grasping the learners to watch the film or documentary without any real-life distractions. This can be observed through the application of Social Learning Theory (Bandura, 1977), which relies on Attention, Retention, Reproduction and Motivation. The primary purpose of screening a Film or Documentary in media education is to inspire and motivate the learners to explore the untouched essence of livelihood. Usage of Extended Reality allows the learners to pay deeper attention towards the screen narration. This undistracted attention creates a path for Retention, where the brain stores the required memory

that leads to Reproduction i.e., execution of the observed information as media content. Finally, the execution of the learned idea transforms itself into a deeper motivation.

Implementation of Extended Reality (XR) definitely shall increase the process of interaction at two levels. Firstly, the learners interact with the screen narration without the touch of the real environment, which helps them to consciously grasp the underlying essence. Secondly, the learner can interact with the teacher during or after the screening session virtually, where teachers can explain the film or documentary theories using virtual video examples. Such two-level interaction increases the learners' interest and knowledge in the subject, letting them to experience film and documentary as real-life elements through XR.

Extended Reality (XR) tailors the physical world with the virtual world in creating a heartening development in film - documentary viewing behaviour (Ding, 2018). It creates an immersive platform for both teachers and learners to interact with one another, by dissecting the film into different parts. This illuminates the scope of deeper understanding that allows the students to take film and documentary as serious subjects of learning. Application of XR enhances the ability of both the teacher and learner to experience the Screen and not just view the Screen. Research experiments in this area is still in infancy.

4. VITALITY OF XR IN TEACHING MEDIA STUDIES IN/THROUGH ONLINE PLATFORMS

In the current scenario, it has become an inevitable choice to apply ICT in education. The pandemic situation has completely replaced face-to-face communication with digital technologies in the academic world. Virtual reality and Mixed Reality have become the most modern and sophisticated priorities of the Teaching-Learning process today. Extended Reality (XR) paved the way to modernize the education system by experiencing the learning process.

The shift from traditional classroom set up to online educational platforms is in the standard rise. Online academic platforms have become 'the need of the hour' technology to cope up with the demand for interdisciplinary knowledge skill sets. This new blended learning helps the students to enjoy the 'play way learning' virtual environments. The multiple intelligences of the student community can be effectively incorporated with a virtual learning environment for a productive academic output. The contemporary educational system provides us with a wide range of online courses offered by leading universities around the world. Extended Reality is the current platform to explore the new possibilities of learning. It helps the students and teachers to interact and visualize the subjects in a coherent manner.

In recent years there is increasing popularity of software games among children and adolescents. Many empirical studies confirm that software games constitute the principal way that children and adolescents become acquainted with the use of computers and devote a lot of their time on them (Mumtaz, 2001).

Being actively engaged in a learning activity has repeatedly been shown to be beneficial for learning; engagement with a learning environment facilitates exploration and conversely exploration promotes engagement (Price, Rogers, Scaife, Stanton, and Neale, 2003). The

resulting hybrid applications that combine education with entertainment are often referred to as edutainment.

Chang, Hwang, Chen and Müller proposed useful principles for the design of augmented reality from the viewpoint of product design in 2011, to avoid pitfalls, which included the use of proper visual design techniques and the understanding of the user's experience. The study also suggested that industrial designers should participate in the technical development of augmented reality. Therefore, the development and application of augmented reality to design education is not only a technical issue, but also requires the collaboration of diverse design educators to make augmented reality more suitable to students' needs. The result indicated that the use of augmented reality to support design education could be beneficial to students' learning. The design of the system should be intuitive to use, portable, flexible, and should have much of the functionality of the current design pedagogy, in order to effectively improve learning outcomes and to shorten learning time. Intuitiveness is important in the context of both output and input devices. Without intuitiveness, input devices might mislead users and reduce the learning effect while output devices could not improve learning ability simply by digitizing traditional pedagogical systems. Substantiating spatial and abstract concepts in system output is important for computerized design education to successfully increase students' learning outcomes in educational settings.

Extended Reality can present objects in a more intuitive way that is suitable for developing 3D educational programs for design, and allows media students to explore the full potential of media concepts, to evaluate 3D media objects before anything is physically conceptualized. Learners want to be empowered by technology and apply their knowledge and experience to communicate media designs that lead to improved results and greater personal satisfaction. The system can thus build a future in which students will experience competence, clarity, control, comfort, and feelings of mastery and accomplishment.

Tailoring of Extended Reality (XR) in online platforms like MOOC can create an 'Experiential Learning' process that enhances the ordinary online learning process as suggested by David Kolb (1984) in his 'Experiential Learning Theory'. Extended Reality (XR) creates a Concrete Experience, where learners experience the media along with the teachers through virtual presence in a virtual environment. This results in the formation of Reflective Observation, which helps the learner to review and reflect their experiences in creating a strong knowledge foundation. Learners step into Abstract Conceptualization, where a learning space is created for drawing new conclusions from the experiential thought-processes. The acquired media knowledge leads the learners into the final process of Active Experimentation, where they shall plan and execute their learned process as experiential outcome.

5. EXPLORE THE USAGE OF XR GAMES IN CREATING AN INTERACTIVE MEDIA EDUCATION

New Generation Learners live in a world of instant messages and data through mobile phones, social network, drives and cloud storages. They are now exposed to online technologies that lead

them to creative and productive space through YouTube, Tiktok, Clubhouse and live game streaming. Continuous technological exposure of these learners beginning from their childhood not only enables them to access the technology with ease, but it also allows them to create their own content more efficiently compared to the earlier generations. Extended Reality (XR) transforms the productive learning space of educators, learners and researchers. The collaboration of Extended Reality (XR) and Gaming Technology can result in a massive interactive media education, as it enables learners of all types to engage and learn through interaction. The same can begin from Primary Education level, which would ease and enhance the learning processes.

A small case study was conducted on second-grade children regarding the understanding of the solar system. The first experiment involved the usage of ordinary diagrammatic and visual representation of the solar system, which resulted in a minimalized understanding of the planets. Students struggled to name and identify the planets in ordinary online teaching methods. The second experiment involved the usage of a Virtual Reality Glass installed with a Solar System Game, where students have to play the game and align the planets accordingly in its respective orbit in the virtual environment with audio instructions. Students easily memorized various complicated features of the Solar System i.e., size, colour and character through the Extended Reality (XR) game learning. This proved the shift from ordinary Google Meet or Zoom Class to an Extended Reality (XR) Game Learning, that shape the learning process more effectively.

An evaluation experiment was performed at University of Piraeus, Greece on 50 school students between 11 to 12 years old from five different geographical classes. The students were categorized into three based on their Virtual Reality Game Engagement i.e., novice (beginner or new to the game), intermediate (moderately experienced in the game) and expert (highly experienced in the gaming platform). Proper training was provided to the students with different time constraints. The evaluation process was performed under two different phases. During the first phase, they were given a chance to play educational games for about 2 hours with no assistance. All their actions were closely monitored for later evaluation. After which another education

application with VR-ENGAGE was provided with no virtual environment and game-based activity. Novice category students showed good learning progress with VR-ENGAGE whereas the Expert category students struggled to show learning progress without game activity. During the second phase of the evaluation experiment, the same set of participants were provided with a commercial game loaded with detailed virtual representation through sound effects and immersive graphical environments. The participants were fully equipped with high-end gaming virtual weapons during the gameplay; where the students fiercely killed their opponents to solve the posed riddles within the stipulated time span. Participants of all three categories developed high learning progress through high-detailed virtual action games. Application of Extended Reality (XR) in primary, secondary and higher education with sophisticated and attractive graphical environments will improve the students' learning ability (Virvou and Katsionis, 2006). The art and aesthetics of the Teaching and Learning process shall drastically transform with the

usage of Extended Reality (XR) Game Learning.

Anya Andrews's mentioned about a Virtual Reality Exposure Training (VRET) organized by the Research and Development Team of Orlando, Florida in 2011 in her paper, "Serious Games for Psychological Health Education". The team designed a game called "Walk in My Shoes", which was intended for a Diverse Learner Audience, ranging from military personnel at different stages of deployment cycle (pre-deployment, deployment/in-theatre, and post-deployment) to veteran and civilian populations, whose psychological well-being may be affected by the stress-inducing challenges of the military life. The participants were intended to explore the stages of the military deployment cycle to find out the Psychological Health (PH) related issues they face which includes; stress prevention recognition and management skills. The game consists of Narrative-Centered Environments that evokes the interest of the users to participate in a virtual environment to participate in narrative-based problem-solving activities. The participant enters the virtual living room and meets the main characters with the help of a Photo Album. They will experience a variety of psychological challenges drafted with the help of Dr. Livewell (a trained military psychologist). The prototype development primarily focused on pre-deployment preparations. They provided different varieties of virtual environments which gave the user meaningful interaction including a legal aid office, bank, parent's house, friend's house, park area, bar and others. During this journey the user comes across a variety of channels which includes family, friends, financial professionals, etc. The game allows the user to engage in decision-making activities and cognitive exercises for practicing the coping strategies in the virtual environment to be applied in real life.

Ample researches around the world proved that the Usage of game technology along with Extended Reality (XR) definitely enhances interaction between teacher and learner confirming deeper experiential knowledge gain at fewer time span.

6. CONCLUSION

Current COVID-19 pandemic situation has completely paused and transferred the traditional education platform into an online blended educational platform. This sudden drift holds its own advantages and disadvantages. Online education platforms were available long before the pandemic ecology and its effectiveness has been proven successful in various educational fields. Extended Reality (XR) would be an

extended form of virtual and blended tools, in creating a learning environment for both teachers and learners mutually. Media Education includes enormous fields such as., Photography, Film Studies, Documentary Studies, Communication and Cultural Studies, Advertisement Production, Radio and Television Production, New Media Studies, Animation, Designing, Copywriting, Journalism etc. Usage of Extended Reality (XR) to form a virtual real-life environment within the computer software creates an immersive cum interactive media educational platform.

Tailoring the concepts of Extended Reality (XR) shifts the online classroom into a virtual classroom with traditional interaction through virtual real-time experience. This new methodological drift in media education will benefit every type of learner, as each learner can

hold their own space of exploration to educate and interact with the media contents. The information provided as course materials for theoretical subjects and practical subjects remains as information until the learner grasps and experiences it. The level of grasping information and its transformation into knowledge consists of a gap that differs across learners. Extended Reality (XR) fills this gap accelerating the transformation of information into knowledge at a faster pace as learners hold their own freedom of choosing their mode of interactive-immersive learning process. It also assists the teachers to actively interact with their students face-to-face in a real media environment. Extended Reality (XR) equips the process of hands-on training in teaching practical classes and transmutes theoretical subjects into an experiential learning process.

Studies tailoring Extended Reality (XR) and education is inadequate as it is still in the infancy stage. Future researchers can take this opportunity to explore and experiment the wide scope of Extended Reality (XR).

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