Learning in the world of new normal on virtual world under virtual learning environment

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Abstract

This academic article mainly represents the issues and the guidelines related to learning in the world of new normal on virtual world, which can be applied in learning management in the digital world. This style of learning is also considered a new dimension of learning management without borders. Learning for learners in the world of new normal usually refers to learning in a virtual world in which learners can learn, no matter where they are, in a virtual learning environment. This way of learning can be implemented by making use of existing technologies or platforms, which enable a new form of learning without borders. Learning in the virtual world requires learning technologies and innovations to support instruction activities in a virtual learning environment and learning through a virtual community. The said technologies and innovations include augmented reality technology, virtual reality technology, mixed reality technology, extended reality technology, artificial intelligence technology, machine learning, etc. Such kind of learning also requires the integration of three elements to achieve optimum usability, i.e., hardware equipment, application software, and virtual learning environment. All of these elements enable learners to learn, do activities together, and interact with one another in a virtual world. In recent years, many forms of learning in the virtual world have been widely applied to education in order to promote lifelong learning, for example, learning through 3D animation, learning through virtual classrooms, practicing through virtual laboratories, searching for learning resources through virtual libraries or virtual museums, exploring exhibitions through virtual exhibitions, etc. Overall, the application of virtual technology to various fields results in a digital learning society that can respond to the digital transformation in the future. By this way, learners shall be promoted to learn and engage in interactive activities in an instant manner through mobile devices and 3D rendering devices under virtual learning environment.

Keywords: learning in the world of new normal, virtual world, virtual learning environment, virtual community

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Introduction

The application of different technologies to support learning in the world of “new normal” style is an alternative for today's instruction and business operation. Many educational institutes have employed virtual technology in their instruction management by making use of existing technologies or platforms to create a virtual learning environment (VLE). Virtual technology enables learners, in the form of 3D avatar, to learn, do activities together, and interact with one another in a virtual world. So far, learning management has been continuously developed, in terms of both traditional instruction and active learning, and it would focus on activities rather than lectures (Boonphak, 2020). Instructors are required to set up goals corresponding to activities in a way that they will generate learning, focus on skill development, and build positive attitudes towards lifelong learning. At the same time, learners must have engagement in learning management and plans, in which the activities must encourage learners to have motivation in learning, exchange knowledge with one another, and solve any problems. In addition, some different situations and atmospheres are created to facilitate learners to have fun and convenient while learning together.

Learning innovations and technologies refer to the use of new ideas, new methods, or new things for further improvement (Sangsawang, 2021). Virtual technology is considered a tool that can encourage learners to have more commitment and more motivation to learn (Kerawalla, Luckin, Seljeflot, & Woolard, 2006). Researches on this technology have paved new ways for instruction and education of present days and in the future. There are also many case studies that address the use of virtual technology in educational environments, e.g., learning through 3D animation, learning through virtual classrooms, practicing through virtual laboratories, searching for learning resources through virtual libraries or virtual museums, etc. As a consequence, it can be clearly seen that the advancement in technology is one of the factors that result in digital transformation, in which digital technologies are widely utilized in various sectors (Kumpai, Kusirirat, & Wata, 2020; Phoonsawat, Wanpeng, Homsai, & Pongsophon, 2022). The concepts and the principles of new technologies and innovations have been integrated with an intention to facilitate learning in the virtual world under a virtual learning environment, which can support diversified learning formats and learning situations in the future.

Learning in the virtual world under a virtual learning environment is a new format of instruction approach that employs learning technologies and innovations to support the “new normal instruction”. In this way, learners are encouraged to learn and engage in interactive activities instantly

via mobile devices and 3D display devices. Education today relies on a number of innovations and technologies that offer many more opportunities in education and reduce limitations of time and place. Moreover, it is believed that these technologies can promote and generate the full potential of learning through media and technologies that can provide an environment similar to the real learning environment, resulting in a learning society without borders.

Elements required in learning on virtual world

Learning in the virtual world requires the integration of several elements to achieve appropriate usability. There are three main elements which are indispensable in learning in the virtual world, i.e., hardware devices, application software, and virtual learning environment. Each of these elements can be summarized as follows:

1. Hardware device is a 3D device that can be used in a virtual environment and it must be able to support interactions between users in the virtual world (Alan, William, & Jeffrey, 2009). Hardware devices can be divided, according to the functions, into two types.

1.1 3D output device: It is used to display data after receiving the said data, in the form of signals or commands, from an input device. Once being processed, the input data will be displayed in different formats, such as images or sound, depending on the types of specific devices. The said 3D output devices include head-mounted display, BOOM, CAVE, 3D glasses, HoloLens, etc.

Figure 1 3D Glasses (Bitwireblog, 2013).

Figure 2 HoloLens (Microsoft, 2022).

1.2 3D input device: This device serves to receive and process signals, programs, and commands, and then send them to a computer. The samples of 3D input devices are motion sensors, 3D joysticks, tactile gloves, trackballs, etc.

2. Application software is an application program that supports the connection of output devices and hardware in order to create a virtual world as realistic and close to the original environments as possible. Moreover, this program is used to connect input devices and display devices, create and edit objects' details, as well as other functions that enable users to have

immersive experiences as if they were in the physical world.

3. Virtual learning environment (VLE) refers to the use of technology with an intention to assist instruction. It can be a web-based platform or a system that facilitates both learners and instructors in terms of tools and resources (Chookusol, & Wannapiroon, 2021) so that they can access resources and have interaction anytime and anywhere.

Virtual learning environment and new normal in digital world

Virtual learning environment (VLE) refers to the use of technology to assist instruction and it is considered one of the most vital factors contributing to Thailand 4.0, especially in terms of learning designs and digital learning platforms (Chookusol, & Wannapiroon, 2021), which was indicated in Human Resource Development, Thailand's 20- year National Strategy (Office of the National Economic and Social Development Board, 2017). Virtual learning environment enables learners to learn anywhere and anytime whereas instructors are responsible for allocation of environments appropriate for learners.

Virtual learning environment (VLE) is a learning environment that is designed and developed in a systematic manner by applying technologies to help in instruction management, curriculum management, and establishment of learning activities (Chookusol, & Wannapiroon, 2021). This technology encourages learners to have more engagement and easy access to learning resources anytime and anywhere. The features of the virtual learning environment (Dillenbourg, Schneider, & Synteta, 2002; Yusny, 2017) can be concluded as below.

- Virtual learning environment is regarded as a social space in which interaction takes place within a co-working space.

- Virtual space is clearly represented by the creation of a 3D immersive learning environment.

- Virtual learning environment arouses learners to have enthusiasm to learn because they will have more engagement as players in the said virtual space.

- Virtual learning environment promotes learning without borders and supports virtual classroom activities.

- Virtual learning environment is a combination of various technologies and different teaching approaches.

- Virtual environment is the overlay between virtual world and physical environment (real world).

Figure 3 Virtual learning environment via Metaverse (EDUmetaverse, 2021).

(Figure 3) represents the virtual learning environment via metaverse, in which users have engagement in activities and can access learning resources anywhere and anytime, leading to the sharing of co-working space. After having studied, analyzed, and synthesized some relevant researches (Dillenbourg, Schneider, & Synteta, 2002; Yusny, 2017; Chookusol, & Wannapiroon, 2021; Palaniappan, & Norah, 2022; Wannapiroon, 2022), the author has summarized the benefits of employing virtual learning environment in education in the digital era as follows.

1. Provide more flexibility in instruction by making use of technologies. Encourage learners to learn all the time since they can interact anywhere and anytime.

2. Create new instruction models that can motivate learners to learn by giving them more engagement and freedom. By this way, learners are eager to explore problem-solving concepts and then apply what they have learned, which is the responsibility for self-learning.

3. Easy to use for both learners and instructors because some platforms today have been developed to support limitless learning, which is suitable for learners in the digital age who prefer self-directed learning and never stop seeking knowledge.

4. Promote interaction amongst learners, and between learners and instructors, by integrating technologies with instruction and learning activities. This encourages learners to have more engagement in learning and express their opinions in a virtual learning environment.

5. Promote learners and instructors to develop digital literacy skills by letting them learn, use, and access new technologies with no limit.

6. Provide flexible support for instructors, who have no fixed working hours or workplaces, to communicate with their learners.

7. Provide new learning potential, such as active and independent learning, which makes use of online communication, online assessment, and collaborative learning.

Metaverse – New normal of learning in a virtual environment

Metaverse is a new dimension of education management without borders. It is related to the use of virtual technology to increase the accessibility to learning resources by exchanging information through a 3D virtual world (Damar, 2021). This includes the management of learning activities in immersive learning environments, which will enable learners to achieve deep learning by means of self-directed and experiential learning (Wannapiroon, 2022). Due to the rapid growth of technologies and the rapid evolution of data presentation through virtual environments, metaverse is considered an alternative of education management that is compliant with the learning in the world of new normal, and meanwhile it can also promote the continuous learning, as shown in (Figure 4).

Figure 4 Metaverse via Spatial.io (Spatial, 2021).

The creation of real-world environments with the aid of technologies results in a virtual learning community or metaverse. It is a new dimension of education management without borders based on the application of virtual technology, which is believed to provide learners with new experiences, arouse them to learn, and create learning activities for them to do together. Additionally, metaverse brings about the merging of the physical world and virtual world, which can make changes and propel the world in a boundless manner (Boonlue, 2022). Key technologies with a vital role in the implementation of new normal of learning in virtual environment, are shown in (Figure 5).

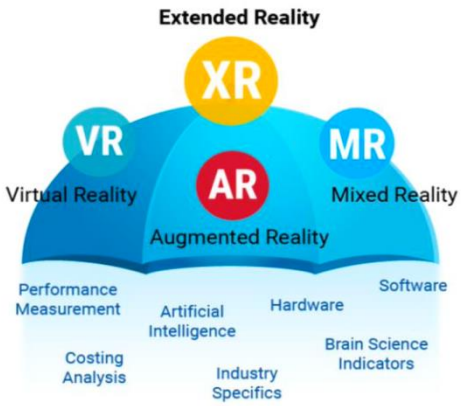

Figure 5 Key technologies with a vital role in the implementation of new normal of learning in virtual environment (Greenstein, 2022).

There are some key technologies that have a vital role in the implementation of the new normal of learning in a virtual environment. As to the synthesis and the analysis on a variety of case studies related to the education field, the said key technologies include augmented reality technology, virtual reality technology, mixed reality technology, extended reality technology, artificial intelligence technology, machine learning, etc. Besides these technologies, in order to make the learning in the world of new normal of learning in a virtual environment as realistic as possible, it also requires hardware equipment compatible with 3D virtual systems, application software to support the connection of output devices and hardware, and virtual learning environment. All of these technologies are essential in the virtual world and they can promote learners' full potential of learning in the world of new normal. This is because they are able to learn and interact through media and technologies in the environment similar to that of the physical world, which will result in a borderless learning society.

Application of learning on virtual world in education

The change in education system in the era of Thailand 4.0 results from Thailand's 20-Year National Strategy (2017-2036), which is related to the vision "Thailand as a developed country with security, prosperity, and sustainability in accordance with the principles of the Sufficiency Economy Philosophy", stated in the 12th National Economic and Social Development Plan. Thailand 4.0 is a commitment to transform the economic structure into a value-based economy. In order to achieve that goal, the production and development of manpower, research, and innovations are required to strengthen the country's competitiveness (Phoonsawat, Wanpeng, Homsai, & Pongsophon, 2022). The society in which technologies play a significant role in human life is the consequence of human needs, which help accelerate the evolution of technologies by leaps and bounds.

At present, there are many case studies that address the application of virtual learning environments in education in response to the rapid changes and diverse situations in the

world, resulting in new models of learning that integrate with the real world. Nevertheless, referring to such kind of education management using a virtual learning environment, it is necessary for instructors to do appropriate learning designs so that the such learning is consistent with their objectives. The case studies that apply learning on virtual world in education are as follows:

1. Virtual classroom is an online space created in the form of classroom that allows learners to interact with virtual objects or surroundings (Chatwattana, Kuntama, & Phadungthin, 2020). It is an online learning environment that encourages instructors and learners to interact with one another. In reference to the research concerning the development of instruction in the form of online teaching, synchronous teaching seems to be more efficient than asynchronous teaching because learners can meet their instructors at the same time (Boonlue, 2022) even though they are not in the same place. Learning through 3D-interactive virtual classrooms is a combination of new technologies and teaching methods to generate new ideas and innovations that can promote learning among learners of the new generation and correspond to their learning experiences directly. Virtual learning environment can be created through a virtual classroom, in which learners are allowed to interact with virtual objects or surroundings created by users with the aid of efficient devices or technologies, as shown in (Figure 6).

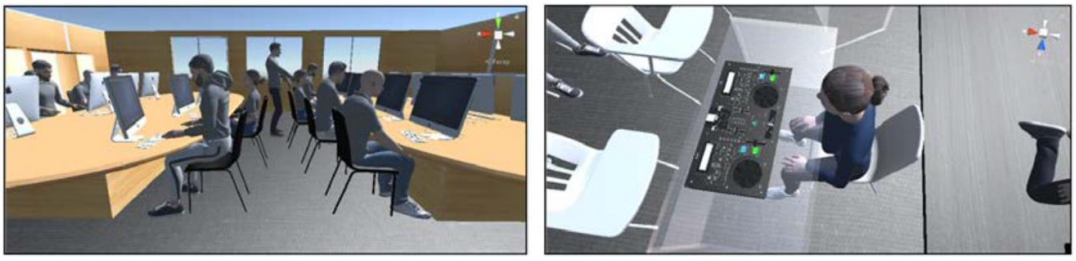

Figure 6 Learning through 3D-interactive virtual classroom (Chatwattana, Kuntama, & Phadungthin, 2020).

2. Virtual laboratory is an instruction management that is very popular in the age of Education 4.0 and among learners in the 21st century. This is because it is a format of learning management through a virtual laboratory assisted by potential technologies, and it provides learners with virtual experiences that they are able to explore by themselves (Wattanasin, Chatwattana, & Piriyasurawong, 2021). This technology also supports instruction activities in a way that learners

are allowed to participate in the activities and interact by means of self-directed learning in an active learning environment, as shown in (Figure 7).

Self-directed learning focuses on assisting learners to gain learning experience on their own so that they will have more skills and capability to conduct self-learning, search for learning resources, and evaluate their learning results by themselves. The whole process will mainly allow learners to do everything through media and information technology by themselves as much as possible from the beginning to the end (Chatwattana, & Phadungthin, 2019). This model of learning is considered an instruction management suitable for learners of new generation education who usually place an emphasis on active learning, critical thinking, and making use of their knowledge corresponding to any situations.

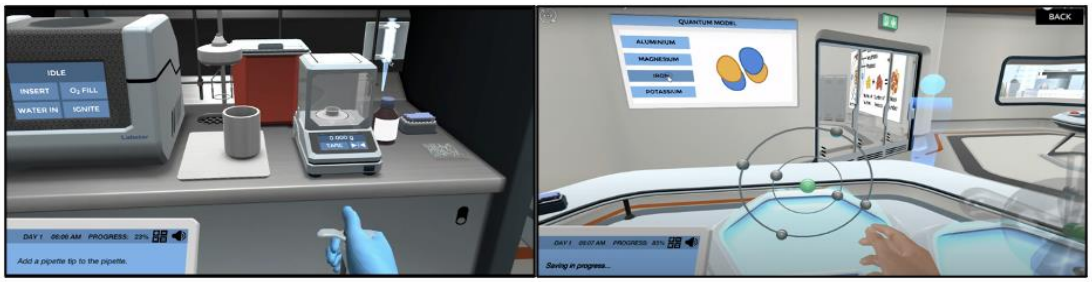

Figure 7 Labster chemistry virtual labs (Labster, 2021).

3. Virtual exhibition is a kind of exhibition created by the use of virtual technology so that the audience can visit the said exhibition in a simulated location and simulated presentations. Users must use a 3D avatar to enter this virtual environment and then they can interact with anything within this environment, as shown in (Figure 8).

Figure 8 Virtual exhibition KKI 2021 (KKI Official, 2021).

Learning skills on virtual world

Currently, a number of higher education institutes have begun to increase freedom of knowledge and adjust access to knowledge resources while preparing for the significant change of digital technologies and innovations, leading to the so-called Education Transformation (Thanachawengsakul, & Thanyavinichakul, 2020). It is related to the increased access to learning resources, the new styles of learning, and action learning based on transdisciplinarity in order to generate essential skills (Chatwattana, 2021b).

The education management for learners of the new generation requires learning skills that can support learning in the virtual world and bring about continuous learning. Thereby, the author would like to summarize these skills as follows.

1. Digital literacy skill is related to understanding and use of digital technologies that encourage learners to have lifelong learning, and at the same time create a learning society based mainly on the utilization of information technology. It is one of the 21st century skills that learners need to possess. Digital literacy is an ability to create varied contents by means of relevant digital tools. The ability in digital literacy (Chatwattana, 2021a) is divided into 3 parts. i.e., use, understand, and create. Meanwhile, digital literacy skills consist of media literacy, technology literacy, information literacy, visual literacy, communication literacy, and social literacy.

2. Creativity & innovation skill is the ability generated from creativity. In other words, it refers to the brain's ability to express multiple broadened and scrupulous perspectives (Chatwattana, 2021b) which will lead to the invention of new works or innovations, or the modification of existing items to be distinguished from others.

3. Collaboration skill is the ability to work with others, leading to the link and sharing of knowledge, and then coming out as actions. It is about a systematic work process within the group, positive interaction with each other, and good coordination (Chatwattana, 2021b). All of these contribute to the accomplishment of missions and achievement of mutual objectives and goals.

Conclusion

Learning in the virtual world under a virtual learning environment is regarded as a new model of learning that is corresponding to learners in the digital era. It is associated with the application of learning technologies and innovations to support the instruction approaches that can encourage learners to learn and do activities with others via mobile devices and 3D rendering devices. Education today usually relies on a number of innovations and technologies that

offer many more opportunities in education and reduce limitations of time and place. Moreover, it is believed that these technologies can promote and generate the full potential of learning through media and technologies that can provide an environment similar to the real learning environment, resulting in a learning society without borders. Learning in the virtual world with the aid of virtual technology requires the integration of the following three elements, i.e., (1) Hardware device, a 3D device that can be used in a virtual environment and can support interactions between users in the virtual world. Hardware devices can be categorized, according to the functions, into two types, 3D output device and 3D input device. (2) Application software, an application program that supports the connection of output devices and hardware devices in order to create a virtual world as realistic and close to the original environments as possible. (3) Virtual learning environment (VLE), the use of technology to assist instruction and facilitate both learners and instructors in terms of tools and resources so that they can access resources and have interaction anytime and anywhere. In recent years, learning in the virtual world has been widely applied to education and it is deemed as a new model of learning integrated with the real world. The focal point of such learning is to encourage learners to perform learning activities in virtual community, e.g., learning through virtual classrooms, practicing through virtual laboratories, exploring exhibitions through virtual exhibitions, learning and doing activities in metaverse, etc.

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