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The Virtual Learning Environment Model on Cloud using Hybrid Learning

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Abstract

The objectives of this research are (1) to study and synthesise the conceptual framework of the virtual learning environment model on cloud using hybrid learning, (2) to develop the virtual learning environment model on cloud using hybrid learning, and (3) to study the results after using the virtual learning environment model on cloud using hybrid learning. The participants in this research include 10 experts from various institutions, all of whom are specialised in design and development of instruction models and instruction systems. The research tools herein consist of (1) the virtual learning environment model on cloud using hybrid learning, and (2) the evaluation form on the suitability of the virtual learning environment model on cloud using hybrid. According to the results of this research, it is found that (1) the overall suitability of the development of the virtual learning environment model on cloud using hybrid learning (overall elements) is at the highest level (Mean = 4.62, SD. = 0.49), and (2) the overall suitability of the development of the virtual learning environment model on cloud using hybrid learning is at the highest level (Mean = 4.66, SD. = 0.48).

Keywords: virtual learning environment, cloud technology, hybrid learning, creative thinking

1. Introduction

At present, the advancements in various technologies and the development in both hardware and software have proceeded in a very rapid manner, resulting in a great change in today's education. Learners are able to use technology to search and seek for knowledge from a great number of sources anywhere and anytime. As a result, it is necessary that education and instruction systems in Thailand should be enhanced and adjusted in order to make the learners well prepared and well equipped with knowledge skills and problem-solving skills to enter the workforce in the 21st century. In addition, they are expected be able to create creativity by their own so as to create new innovations in their work and to succeed in their career life. Education is, therefore, an extremely important factor that enables learners to have both creativity and quality, which is believed to have an effect on the development of the nation as well. Thus, creative thinking must be promoted because it can create perspectives and development in many aspects of daily life (Ministry of Education, 2017).

Today, virtual learning environment, created by means of virtual reality technology, has now been developed and employed in a variety of industries, including education. The environment simulated by the computer systems or software is aimed to create a realistic environment that corresponds to human senses, such as sight, hearing, touch, smell, and taste, etc. (Chunpungsuk et al., 2021; Jantakoon et al., 2019). There are many different channels to access the network learning systems by means of computers, notebooks, tablets, and smartphones, all of which can lead to rapid learning. Nowadays, many technologies have been introduced to support the high volume of learning.

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 (Chatwattana, 2022; Chookusol & Wannapiroon, 2021). The features of the virtual learning environment (Chatwattana, 2022; Dillenbourg et al., 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).

Cloud technology is a technology that focuses on the integration of networking and computing, storage, and data service resources. Cloud system is also regarded as a service that can effectively satisfy the needs of both instructors and learners. It can also encourage creative thinking, which is thought to generate new innovations in the future (Chatwattana, 2018; Souththaboualy et al., 2022; Supaluk, 2018). One of the technologies that is popular and widely mentioned nowadays is cloud technology (Chatwattana & Phadungthin, 2019; Chatwattana, 2018), in which a great number of resources are available in internet network with no need for users to buy high-price equipment. Thus, such a service of cloud technology has been applied and integrated to create instructional activities for both instructors and learners in such a more convenient manner.

Hybrid learning is a combination of traditional classrooms with such technologies as computers and Internet. Hybrid learning enables learners to study anywhere and anytime, and it can be a learning method that combines a traditional classroom with online learning activities. Accordingly, hybrid learning is a combination of face-to-face learning and online learning with the aid of different internet tools intended to support the traditional curricula (Tangjitnusorn, 2015). Nilayon (2019) said that the benefits of hybrid learning, i.e., allowing flexibility, learning diversity, fostering autonomy when learning is outside the classroom, saving time, creating more individualised and personalised learning experience and support, promoting collaborative learning, accommodating variety of learning styles, and developing 21st century learning skills.

Virtual reality is a group of computer technologies that construct and work on a control system in the virtual environment with a computer system to makes users feel like they are using their life in an environment created and be like seeing with their eyes and have accessories for touch such as masks, touch gloves, etc. (Chunpungsuk et al., 2021) Weennasusoprasit (2005) gave the meaning about “Virtual Reality” that it is the evolution from science and research that called Haptic. Haptic is a science that relates to feelings. And it was received from human touches such as images, sounds, and other elements, to make humans feel like, they are being in a real environment and can able to interact with that environment.

In reference to the principles and the theories above, the researchers have had an idea to develop the virtual learning environment model on cloud using hybrid learning, which is expected to be applied in the instruction systems that focus mainly on creative thinking. Since today's society is placing an emphasis on the development of innovations and novel things, it is necessary to promote these things, especially those related to the fields of industry or technology, so that the new innovations and the new industries can be initiated in Thai society, and at the meantime to fulfill the needs of the workforce in the 21st century. Hence, the application of virtual technology on cloud in learning management is highly essential in order to foster creative thinking in response to the learning styles of learners in the digital age.

2. Research Objectives and Hypothesis

In this study, the researcher set the objectives as follows:

O1: Study and synthesise the conceptual framework of the virtual learning environment model on cloud using hybrid learning.

O2: Develop the virtual learning environment model on cloud using hybrid learning.

O3: Study the results after using the virtual learning environment model on cloud using hybrid learning.

The research hypothesis for a study of the development of the virtual learning environment model on cloud using hybrid learning is as follows:

H1: The suitability of the virtual learning environment model on cloud using hybrid learning is at the high level.

3. Research Methodology

This research is related to the design and development of the virtual learning environment model on cloud using hybrid learning, and the research methodology includes the following.

3.1 Research Participants

10 experts from various institutions specialised in the design and development of instruction models and instruction systems.

3.2 Research Tools and Statistics Used for Data Analysis

To develop the virtual learning environment model on cloud using hybrid learning, the researchers employed the following research tools, i.e., (1) the virtual learning environment model on cloud using hybrid learning, and (2) the evaluation form on the suitability of the virtual learning environment model on cloud using hybrid. The statistics used for data analysis are mean and standard deviation.

3.3 Research Methodology

The researchers designed the methodology based on the concepts and the theories of the system approach (Khemmani, 2010; Utranan, 1982) and based the design and the development of this model on SDLC technique (Robert et al., 2013). The methodology can be summarised into three steps as illustrated in Figure 1.

Figure 1. Research methodology

Step 1 is related to the study, the analysis, and the synthesis of the literature works and research studies relevant to the development of the virtual learning environment model on cloud using hybrid learning in order to find out the guidelines needed to establish the conceptual framework of this research, i.e., hybrid learning (Tangjitnusorn, 2015), virtual learning environment (Jantakoon et al., 2019), cloud learning system (Chatwattana, 2018; Soutthaboualy et al., 2022; Supaluk, 2018), and virtual reality technology (Chunpungsuk et al., 2021; Weennasusoprasit, 2005).

Step 2 is about the development of the virtual learning environment model on cloud using hybrid learning. In this step, the researchers adopted the principles of system approach in the design and the development, which consist of four factors, i.e., input factor, learning process, output, and feedback.

Step 3 is concerning the study of results after using the virtual learning environment model on cloud using hybrid learning. The researchers used the research tools to study the results after this model had been used by 10 participants derived by means of purposive sampling. These participants come from various institutions and all of them are all experts specialised in the design and development of instruction models and instruction systems. The mean score range and interpretation of results (Kanasutra, 1995) are listed in Table 1.

Table 1. Mean score range and interpretation of results

Range of average score	Interpretation of appropriateness
4.50 – 5.00	The suitability is at the highest level.
3.50 – 4.49	The suitability is at the high level.
2.50 – 3.49	The suitability is at the moderate level.
1.50 – 2.49	The suitability is at the low level.
0.00 – 1.49	The suitability is at the lowest level.

4. Results

The results of the development of the virtual learning environment model on cloud using hybrid learning can be summarised as below.

4.1 Results of the Synthesis of the Conceptual Framework of the Virtual Learning Environment Model on Cloud Using Hybrid Learning

According to the study, the analysis, and the synthesis of the literature works and research studies relevant to the development of the virtual learning environment model on cloud using hybrid learning, the researchers found out the guidelines needed to establish the conceptual framework of this research, i.e., hybrid learning, virtual learning environment, cloud learning system, and virtual reality technology. The conceptual framework herein is illustrated in Figure 2.

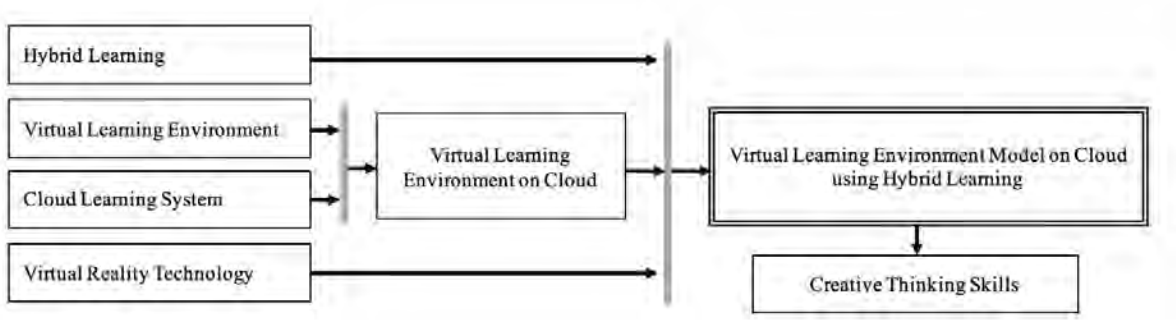

Figure 2. Conceptual framework of this research

4.2 Results of the Development of the Virtual Learning Environment Model on Cloud Using Hybrid Learning

The development of the virtual learning environment model on cloud using hybrid learning is intended to be used as a guideline to design and develop the virtual learning environment system on cloud using hybrid learning. The objective of the said system is to promote creative thinking skills among learners in the future. The design and the development of this learning model are based on the system approach, which includes four elements, i.e., input factor, learning process, output, and feedback, as shown in Figure 3.

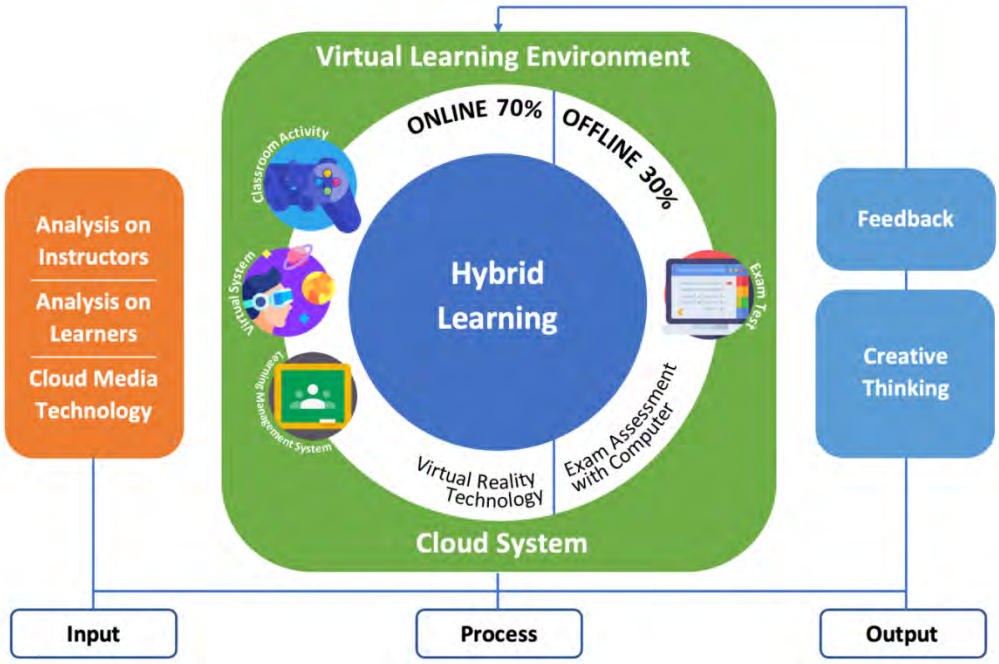

Figure 3. Virtual learning environment model on cloud using hybrid learning

Figure 3 represents the virtual learning environment model on cloud using hybrid learning, which consists of four main elements as follows.

1. Input factor refers to the relevant elements of which the information shall be used to design and develop the virtual learning environment model on cloud using hybrid learning. The input factor herein includes the analysis of characteristics of users (learners and instructors), the study of learning environments, and cloud learning technology.
2. Learning process refers to the learning process within the virtual learning environment model on cloud using hybrid learning. It is a combination of learning in virtual environment, which is in the online format, and learning in classroom with computer-based tests (learning ratio 70:30). The tools used to support the online learning are instruction activities, virtual systems, learning management system on cloud, etc.
3. Output refers to the outcome generated from the learning process, which is creative thinking skills. Creative thinking skills are the ability of the brain to come up with new ideas related to different aspects, which are believed to lead to the creation of new things. It also means thinking in multiple directions with broadened perspectives and great caution, which is thought to bring about the invention of new workpieces or innovations, including the modification or improvement of the existing things so as to create their new and unique features.
4. Feedback refers to the information derived from the output and then used to enhance the learning process and the input factor. The feedback herein consists of the results of measurement on creative thinking skill and the opinions from the experts.

4.3 Results of the Study on the Suitability of the Virtual Learning Environment Model on Cloud Using Hybrid Learning

In reference to the development of the virtual learning environment model on cloud using hybrid learning, the results can be concluded as seen in Table 2 and Table 3.

Table 2**.** Results of evaluation on the suitability of the virtual learning environment model on cloud using hybrid learning (overall elements)

Items for evaluation	Assessment results		Interpretation
	Mean	SD.	
1. The principles and concepts of the virtual learning environment model on cloud using hybrid learning can be applied to develop the instruction system.	4.60	0.52	Highest
2. The elements of the virtual learning environment model on cloud using hybrid learning cover all main elements required in the instruction system.	4.70	0.48	Highest
3. The theories of the virtual learning environment model on cloud using hybrid learning are comprehensive and appropriate for designing the conceptual framework.	4.50	0.53	Highest
4. The sequence of elements in the design of the virtual learning environment model on cloud using hybrid learning is clear and consistent.	4.70	0.48	Highest
5. The ordering of the elements in the virtual learning environment model on cloud using hybrid learning is appropriate and easy to understand.	4.50	0.53	Highest
6. The overall elements in the virtual learning environment model on cloud using hybrid learning are complete and can be used as a guideline to further develop the virtual learning environment system on cloud using hybrid learning in the future.	4.70	0.48	Highest
Overall average	4.62	0.49	Highest

According to Table 2, it is found that the overall suitability of the development of the virtual learning environment model on cloud using hybrid learning (overall elements) is at the highest level (Mean = 4.62, SD. = 0.49). It can be concluded that the virtual learning environment model on cloud using hybrid learning has all complete elements that can be used as a guideline to further develop the virtual learning environment system on

cloud using hybrid learning. Such learning system is said to promote creative thinking skills which are considered one of the qualifications that the digital learners must possess. This is because the said skills shall lead to new bodies of knowledge or new innovations generated from self-learning through digital technology in the future. This is compliant to the research of Chatwattana (2021), who said the management of learning environments in a way that can facilitate learners with the aid of existing technologies shall create a learning society in digital universities.

Table 3. Results of evaluation on the suitability of the virtual learning environment model on cloud using hybrid learning

Items for evaluation	Assessment results		Interpretation
	Mean	SD.	
1. Input factor			
1.1 Analysis of characteristics of learners	4.70	0.48	Highest
1.2 Analysis of characteristics of instructors	4.60	0.52	Highest
1.3 Cloud learning technology	4.70	0.48	Highest
2. Learning process			
2.1 Hybrid learning	4.80	0.42	Highest
2.2 Virtual learning environment	4.70	0.48	Highest
2.3 Learning in classroom with computer-based tests	4.50	0.53	Highest
3. Output			
Creative thinking skills	4.60	0.52	Highest
4. Feedback			
4.1 Results of measurement on creative thinking skills	4.70	0.48	Highest
4.2 Opinions from the experts	4.60	0.52	Highest
Overall average	4.66	0.48	Highest

Table 3 shows that the overall suitability of the development of the virtual learning environment model on cloud using hybrid learning is at the highest level (Mean = 4.66, SD. = 0.48). This can be summarised that the virtual learning environment model on cloud using hybrid learning contains the elements that are appropriate to be used as a guideline to further develop the virtual learning environment system on cloud using hybrid learning. Thereby, the said system can also be employed as a tool to promote creative thinking skills by means of learning through virtual environment. This is compliant to the research of Caprara et al. (2022), who said the virtual learning environment (VLE) can be response both learning and interaction among students in real-time using the new innovative tools and technologies to create experiences and spaces that allow students to attend to one another virtually.

5. Conclusion

Once considering education management for the new generation learners, the issue that instructors need to pay attention to is the formats of education that must be up-to-date and can be adapted to the current situations, which is thought to pave way for continuous learning. The selection of learning styles in accordance with the behaviors of today's learners, who like challenges with freedom to learn and varied needs of self-learning, is another issue that instructors must take into account when designing the education formats in order to derive the ones that are suitable for learners.

The virtual learning environment model on cloud using hybrid learning is a concept based on the principles of learning through virtual environment on cloud combined with learning in classroom. The model consists of four main elements: (1) Input factor refers to the analysis of characteristics of users (learners and instructors), the study of learning environments, and cloud learning technology. (2) Learning process refers to the learning process within the virtual learning environment model on cloud using hybrid learning. It is a combination of learning in virtual environment, which is in the online format, and learning in classroom with computer-based tests (learning ratio 70:30). The tools used to support the online learning are instruction activities, virtual systems, learning management system on cloud, etc. (3) Output refers to creative thinking skill. (4) Feedback refers to the results of measurement on creative thinking skills and the opinions from the experts.

Regarding the results of evaluation on the suitability of the virtual learning environment model on cloud using hybrid learning, it is found that (1) the overall suitability of the development of the virtual learning environment model on cloud using hybrid learning (overall elements) is at the highest level (Mean = 4.62, SD. = 0.49), and (2) the overall suitability of the development of the virtual learning environment model on cloud using hybrid

learning is at the highest level (Mean = 4.66, SD. = 0.48). It can be concluded from the evaluation results that the virtual learning environment model on cloud using hybrid learning contains the elements that are appropriate to be used as a guideline to further develop the virtual learning environment system on cloud using hybrid learning. Thereby, the said system can also be employed as a tool to encourage creative thinking skills by means of learning via virtual environment. This is compliant to the research of Chatwattana et al. (2022), who said the combination of technologies and new teaching methods to create new ideas and innovations helps promote the learning among modern learners. This is because they will be able to generate new bodies of knowledge by self-learning, exchange their knowledge with each other through social networks, and create a learning society as well as other skills needed in the 21st century. In addition, it is corresponding to Palaniappan et al. (2022), who said the online learning has a lot of potentials to transform the learning process in higher education. With the use of online platforms, learners can access learning resources anytime and anywhere, that can be increased learner's performance and self-directness towards a meaningful learning experience in an online learning environment.

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