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## SMART LEARNING ENVIRONMENT AND ITS IMPACT ON STUDENT LEARNING PERFORMANCE: A THEORETICAL APPROACH

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**Abstract:** Education now exceeds the class. Smart education is a new paradigm in global education. Learning technology as one element that can be used in a learning environment for improving student performance. Smart learning is a learning system that advises students to learn in the real world. The essence of education or intelligent learning is to create a smart environment by using intelligent technology, so that it can provide personalized learning services and empower students. The aim of a smart learning environment is to provide self-learning and self-motivating services. The need to develop a smart learning environment design that has the potential to increase student motivation and involvement actively which has an impact on improving student learning performance. The conclusion of this article is the success which achieve by students in learning as a result of this intelligent environment.

**Keywords:** *Smart Learning Environment, Student Performance*

### INTRODUCTION

Education now exceeds the class. Smart education or smart learning is a new paradigm in global education. Now, the education and learning environment is increasingly emphasized in the use of innovative learning tools and techniques. The evolution of the learning process is increasing and faster because new technologies place more on the use of tools.

Learning nowadays is becoming smarter due to the rapid development of technology. This causes changes in the settings of conventional learning, where learning can occur anywhere and anytime and in the context of the real world. The main emphasis is placed on the students themselves and all are aimed at accommodating their learning needs in a new and intelligent learning environment.

Learning technology as an element which could be used in learning environment to improve students performance of the student. Various limitations of learning achievement have opened the door for the education system as an alternative, namely by designing a smart learning environment as a new innovation towards improving student learning performance. This paper describes how an intelligent learning environment mobilizes on student learning performance. Thus, the purpose of this article is to explain the concept of intelligent learning environments to explore the main criteria and their effects.

## DISCUSSION

### Smart Learning

#### 1. Smart Learning Concept

With rapid development of cellular technology, the current learning process, <sup>1</sup> on the one hand is more effective but on the other hand is more complex because it requires modification and adjustment of learning methods and materials that suit the needs of students.

According to Spector (2014) that <sup>1</sup> with the development of ICT in education and considering improved <sup>10</sup> technological innovation, researchers began conceptualizing how the learning environment <sup>10</sup> can be made more effective, efficient, and involved <sup>10</sup> on a large scale and sustainably.

Koper (2014) <sup>14</sup> provides understanding of Smart Learning Environments (SLE) as a physical environment <sup>14</sup> enriched with digital devices, conscious and adaptive contexts, <sup>14</sup> to promote better and faster learning. While according to Li et al. (2015) that with technological support, smart classrooms become places where teachers and students can have rich and profound teaching and learning experiences that they have never experienced yet.

Zhong and Zhang (2006) state that a smart learning environment is an intelligent, open and integrated digital virtual learning study room which focus on the student.

Klimova (2015) explains that a smart learning environment (SLE) is a learning environment that is supported by technology <sup>1</sup> that can make adaptations and provide appropriate <sup>8</sup> support for example in aspects of guidance, feedback, guidance or tools in the right place and at the right time based on individual learner needs, which may be determined through analysis of learning behaviour, performance and online context and the real world in which they are located.

According to <sup>4</sup> Zhu et al. (2016) highlight that intelligent learning is based on <sup>4</sup> two different types of technology, namely (1) intelligent devices and (2) intelligent technology. <sup>4</sup> Zhu and He (2012) further stated that "the essence of intelligent education is to create a smart environment by using intelligent technology, so that smart pedagogy can be facilitated to <sup>3</sup> provide personalized learning services and empower students. While using smart technology, such as cloud computing, analysis learning or big data, focusing on how learning data can be captured, analyzed and directed to improve learning and teaching, and support the development of personalization and adaptive learning, he further explained that the core elements of intelligent learning are based on equipment, tools, technology, media, textbooks, teachers, and students, etc. All of these core elements must be arranged in accordance with constructivist learning theory, blended learning theory and modern teaching theory.

Apart from the difference between smart devices and smart technology, they are interrelated, because there is no independent type of technology. Furthermore, Zhu described ten main features that define intelligent learning, including: (1) Location: in a smart learning location in real time is important data Systems that need to adjust to the content and situation of students; (2) Context: explore various scenarios of activity and information; (3) social awareness: feeling social relations; (4) Interoperable: setting standards for various sources, services and platforms; (5) Current connection: providing continuous service if there is a connected device; (6) Adapting: encouraging learning resources according to access, preferences and requests; (7) Ubiquitous: predict student demands until clearly revealed, provide visual and transparent access to learning resources and services; (8) notes: record learning data paths and analyzed in depth, then provide reasonable assessment, advice and encouragement on-demand services; (9) Interactions: transfer information, including position and facial expression; (10) Engagement: learning experience as a manifestation of interactivity with an environment enriched with technology. In essence, in smart learning, location in real time is important to adjust the contents to the conditions of students. However, location is not always an important requirement in smart learning. The most important characteristic is the system because it can give advice and predict the needs of students. Thus, smart learning is a learning system that gives advice to students to learn in the real world.

## 2. Smart Learning Environment Characteristics

Implementation of smart learning environment goes beyond the application of smart technology. A smart learning environment not only allows learners to access information from digital resources and interact with learning systems anywhere and anytime, but actively provides guidance on learning, direction, support tools or suggestions for learning needed in the right place, at the right time and in the right form.

According to Spector (2014) that a smart learning environment is an environment that is "effective, efficient and attractive". While IlkyuHa and ChonggunKim (2014) state that a smart learning environment is a combination of technology and pedagogy to create a coherent ecosystem that provides evidence of real-time and sustainable changes in knowledge, instilling skills that are seamlessly transferred to students when they move from one learning context to another.

While Chin (1997) argues that a smart learning environment is an environment which focus on the student (student-centered) based on the application of information and communication technology, with the following characteristics; (1) Adapting to different

learning styles and learning abilities of students, (2) Providing lifelong learning support for students and (3) Providing support for the development of students.

Based on the above opinion and analysis of the development trends of technology-enhanced learning, then according to D. Liu et al., That intelligent learning environments must have the following characteristics:

- 1) <sup>14</sup> A smart learning environment must integrate the physical and virtual environment of the environment. In a smart, perceptive learning environment, monitoring and regulating the functions of the physical environment is enhanced. The application of technology adds reality to create a virtual environment integration and a good physical environment.
- 2) A smart learning environment must provide learning support and services that are better suited to the individual characteristics of students. A smart learning environment emphasizes the process, personalized assessment, and evaluation of the effects of sending learning content to students. According to the teacher this model plays an important role in planning, monitoring and evaluating the development of learners' abilities.
- 3) A smart learning environment supports campus learning and off-campus learning, as well as formal learning and informal learning, but also all people who have learning requirements in their work.

Thus, a smart learning environment as a place of learning or activity space to find out the learning scenario, <sup>13</sup> identify the characteristics of students, provide appropriate learning resources and comfortable interaction tools, and automatically record the learning process and evaluate learning outcomes to see the progress of effective learning from students.

### **3. Smart Learning Model and Impact for Student Learning**

#### **a) Smart learning model**

Smart learning is a model system that has a number of components as learning resources. according to D. Liu et al., (2017) the components of a smart learning environment include six components, namely: (1) resources, (2) tools, (3) learning community, (4) teaching community, (5) learning methods, (6) teaching methods. Furthermore D. Liu et al explained the basic learning environment model as follows;

- 1) A smart learning environment mainly consists of six elements of learning resources, intelligent tools, learning community, teaching community, learning methods and teaching methods.

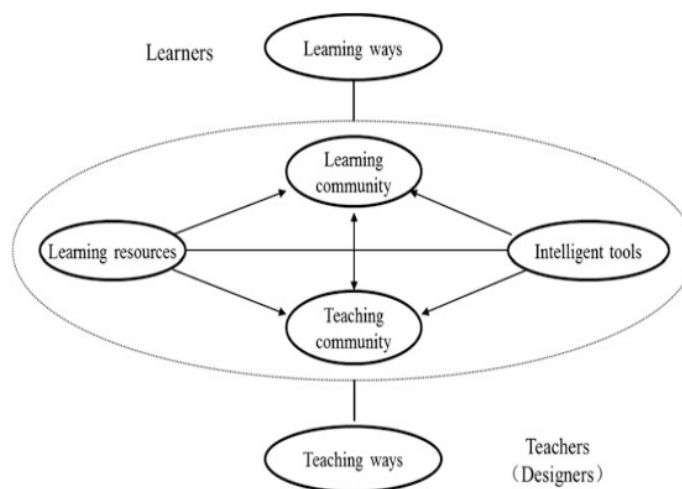
- 2) Students and teachers interact and interact with the other four components by teaching and

learning methods, so that they can bring effective learning from students together. if the way of learning and how to teach is done conventionally, then, a smart learning environment cannot be considered a smart learning environment.

3) The occurrence of effective learning is the result of reciprocity from the construction of individual knowledge and the construction of group knowledge. Learning communities emphasize interaction, collaboration, and exchange of students, while teaching society is a series in which teachers learn together, work collaboratively to continue sustainable professional development.

4) Learning resources and intelligent tools provide support to the learning community and the teaching community. With the development of learning communities and teaching communities it cannot be separated as a shared effect of resources and tools. Therefore, all types of intelligent tools provide comprehensive support for learning environmental intelligence. Thus, the learning community and the teaching community display the evolution of resources and tools.

The components of the intelligent learning environment model as a system can be seen in the following figure.



#### b) Smart Learning Contribution for Student Learning

Smart learning environment must have an impact on learning. Therefore, according to D. Liu et. al (2017) intelligent learning environment provides a positive impact in the form of support for independent learning, inquiry learning, learning in doing, and learning in work, as well as learning in the classroom.

- a. Smart Learning Environment Supports Independent Learning; Self-study refers to student learning behavior that has been agreed before or done voluntarily, usually without tutoring



from teacher learning but with certain learning material, based on pre-determined learning objectives and evaluation methods.

- b. Smart Learning Environment Supports "Inquiry Learning; "Inquiry learning" refers to the form of learning with participation in small group discussions as the main communication approach, based on a topic to be discussed.
- c. Smart Learning Environment Supports "Learning by Doing; Learning by doing "refers to the form of learning activities to facilitate communication among the same subject teachers by developing learning tasks based on learning objectives, meaning between evaluations and assignments, providing support services for students.
- d. Smart Learning Environment Supports "Learning through Work; The scenario of learning "work by work" is learning from experience collected during practical work, which is commonly used in corporate training. Usually requires content based on practical work, work assignments that are in line with work intensity and interpersonal relationships that are suitable for learning.
- e. Smart Learning Environment Supports "Classroom Learning; The learning scenario "classroom learning" refers to learning in real class or similar environment which is collective learning behavior, usually carried out in a classroom with a fixed teaching environment for face-to-face teaching with teachers and teaching materials and assessment tools already prepared.

Starting from the various concepts above, the intelligent <sup>2</sup> learning environment aims to support <sup>9</sup> students to gain new knowledge and skills. In essence, the goal of a smart learning environment is to provide self-learning services and motivate themselves to learn.

Furthermore, Spector (2014) explained that there is also a need to design <sup>9</sup> a smart learning environment to provide motivation for students, to identify student competencies, learning styles and interests. In addition, the learning environment must provide assignments or feedback, and must include pedagogical strategies that support others or others:

- a. Conversation: the learning environment can involve students in dialogue or facilitate group dialogue on relevant topics or problems.
- b. Reflection: the learning environment can produce independent judgments based on student progress and performance, preferably suggesting activities and attributes in a learning environment that can be adjusted to improve overall effectiveness.
- c. Innovation: the learning environment uses new technology and utilizes innovative technology in creative ways to support learning and teaching.
- d. Independent organizations: learning environments can rearrange resources and control mechanisms to improve performance over time based on automatically collected data and are used to improve how the environment interacts with students in various situations.

For this reason, it is necessary to develop a model of intelligent learning environment design that has the potential to increase student motivation and involvement actively so that it has an impact on their learning performance.

While the results of KyuHa and Chonggun Kim's research (2015) showed that using smart tools such as micro-blogging services have a positive effect on the educational environment. Smart devices have positive opinion<sup>1</sup> about educative use of smart devices. Next, Blanka Klimova (2015) in her research entitled **Assessment in Smart Learning Environment -**

A Case Study Approach concludes that the learning environment supported by appropriate technology and adaptation support can produce intelligent students who are able to complete the task, while Zhu, et al. concludes that intelligent education, intelligent learning environment can reduce cognitive burden of students, and also student learning experiences can be deepened and expanded, and can help the development of affective, intellectual, and physical students. Also students can learn flexibly and work together in a smart learning environment, and can encourage the development of personal and collegiate intelligence active students.

According to Klimova (2015) explained that Smart Learning Environment has three important criteria, including:

1. At a minimum it is characterized as a minimal context by considering the student situation or the real-world environmental context in which the student is located.
2. Minimal support for students in the online and real world context.
3. Minimal adaptive to users. For example, how to present information, the condition of students to fulfill personal factors. For example, learning preferences, and learning status. For example, learning performance.

Smart learning environments, defined by Winters, Walker and Rousos in Mikulecký that ubiquitous computing has tremendous potential to frame learning, especially in informal contexts and social constructions. To achieve this potential, it is important for the development of technology focused on the field of education through the design, development and testing of new prototypes for learning. Based on the opinion of Atal, (2009), that learning in the context of anytime and anywhere is a learning paradigm supported by computers to identify the surrounding context and the social situation of students to provide an integrated, interoperable, pervasive, and smooth learning experience. The purpose of learning contexts anywhere and anytime is to improve web-based learning; one step ahead of learning anytime and anywhere to learn is activated at the right time and the right place to use the right resources and the right collaborators.

Furthermore Hwang, Yang, Tsai and Yang, (2009) learning in a ubiquitous context is an innovative approach that integrates wireless, cellular, and technology in the context of detecting the situation of learners in the real world and providing adaptive support or appropriate guidance.

## CONCLUSION

The education and learning environment is increasingly emphasized in the use of innovative teaching and learning tools and techniques. Smart Learning is a learning system that advises students to learn in the real world. The most important characteristic is the system because it can give advice and predict the needs of students. Implementation of a smart learning environment goes beyond the application of intelligent technology. A smart learning environment not only allows students to access digital resources and interact with learning systems anywhere and at anytime, but actively provides guidance on learning, direction, support tools or suggestions for learning needed in the right place, right time and right form. Smart learning environment aims to support students to gain new knowledge, even when they are engaged in relaxing activities.



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