


## Transforming Learning Environments with Information Technology: Trends and Best Practices

**Sri Rahayu**

*Universitas Asahan, Indonesia*

 [srir99774@gmail.com](mailto:srir99774@gmail.com)

### Abstract

This research was conducted as a way to examine contextual factors in the effective application of information technology to help the learning environment which can help carry out transformation in the field of education as a new learning method. The research method used is a qualitative descriptive method by prioritizing library or literature studies in the research process. By referring to the design components and also the implementation of initiatives in the field of education as a way of educational transformation, this research can describe what happens with the advancement of information technology to transformation in the world of education and learning which is also related to the integration of technology, policy recommendations, and also resources. sustainable power. The transformation of the education system of course supports national competitiveness as one of the long-term efforts that receives continuous support and also visionary leadership in providing input for the world of education with the help of advanced information technology.

**Keywords:** Learning Environments, Information Technology, Effective Application

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### INTRODUCTION

The world of technology is currently developing very rapidly. And this has also changed all aspects of life, including the world of education. Technology already has a very important role, especially for students who receive support in their teaching and learning process. The principle of effective learning is of course to rely on technology which can encourage learning methods to be much more effective and efficient. The role of technology is of course as a way to mediate and also support the learning process.

This is of course very important for professors, instructors and teachers so that they can focus on a more effective and efficient learning process that relies on their teaching strategies and methods in the world of education. Technology is able to change teaching strategies which can be achieved with easier access and at a higher level according to Means et al. (2009).

A learning environment that is fun and intelligent can be conceptualized and realized as a learning environment that prioritizes learning flexibility, effectiveness and efficiency to adaptiveness which provides reflectivity to every element in the world of education according to Spector (2014). Meanwhile, based on what Gros (2016) said,

formal learning and informal learning must be able to be integrated with each other with technology which increasingly supports the movement in the world of education.

Basically, this is an adaptive system that can provide capabilities and also improve the learning experience with learning characteristics, preferences and progress by displaying increased levels of engagement and unlimited access to related information. According to Singh & Hassan (2017) that the use of technology in the world of education can improve the learning environment to be much better and also support every element in it as a way to build an advanced educational environment.

Currently, the education system in the world has experienced a significant revolution with the emergence of new educational concepts and information technology reforms which have helped realize the process of revolution and reform. The concepts and reforms that are currently emerging can create new challenges in a learning environment that is smart and also effective and efficient. The progress that occurs in the world of education can certainly be produced by the process of further integration of personalized learning and intelligent learning environments according to the thoughts of Price (2015). Likewise with Chatti et al. (2010) who stated that learning with personal, social, distributed, universal and also flexible to dynamic and complex aspects, can play a quite important role in the world of education.

In a smart learning environment, of course fundamental changes are needed with a more personal, social, open and dynamic learning model that can attract knowledge. Compared to learning models with centralized, static and traditional systems, of course this latest method could be one of the learning solutions in the modern world according to Chatti et al., (2010).

In a good and intelligent learning environment, of course there will be more attention to the individual needs of students. According to Hwang and Fu (2020), a smart learning environment can be a good learning system to facilitate efficient and effective personal learning. Adaptive learning can provide technical and methodological support in personalized learning for students. Adaptive learning is able to make adaptive adjustments according to the individual characteristics of students in order to encourage the individual development of students in the educational environment.

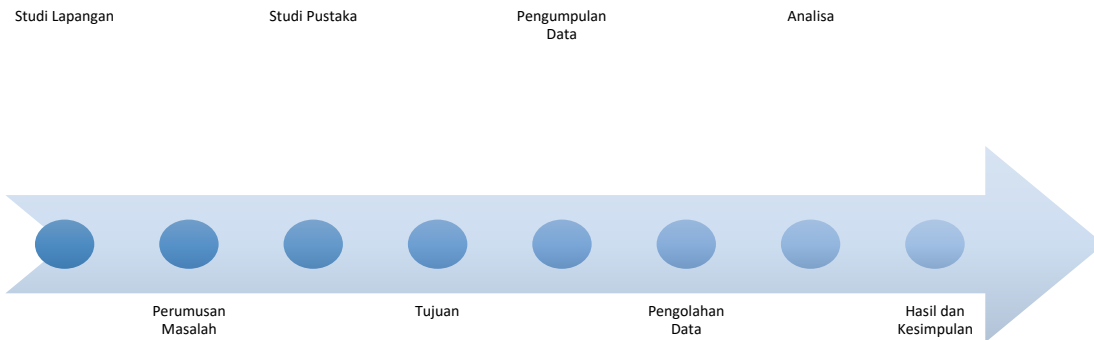
With the development of information technology in the learning environment, it can certainly be used as a way to encourage the development of personalized learning and also adaptive learning for students. A transformed learning environment has great potential by effectively encouraging the development of personalized learning and also building adaptive learning according to Peng, Ma & Spector, (2019).

## **METHODS**

The research method carried out in this research uses the library study method or literature review as a data collection and processing process carried out in making this research. Literature study method or *library research*.

This is a method used in the data collection process in order to understand and also study theories from various types of literature that have a correlation with the research. Using this method, research was conducted to look at the process of transforming the learning environment with information technology that supports the world of education.

Graph 1. Flowchart of Literature Study Methods



## RESULT AND DISCUSSION

According to Feidakis, et al., (2013) that new knowledge is constructed through a process of social interaction. The existence of a learning environment that is transformed and occurs technically, of course does not mean that social interaction can occur in it. Emotions are one of the human psychological responses that can influence and also regulate cognitive activities. Such as aspects of attention, perception, representation, memory, thinking, and also language experienced by human individuals.

This usually occurs in the process of social interaction between students. In a learning environment that still uses traditional methods, affective interactions usually occur between teachers and students with quite high frequency. Meanwhile, with the learning environment being transformed by relying on information technology, of course this is more focused on imparting knowledge rather than social interaction between teachers and students. Therefore, how to increase interaction in a smart learning environment is an important challenge using information technology which is now very fast. One effective solution is of course to build a comprehensive and dynamic learning model according to Hwang & Fu (2020) and can include the emotional side in the world of learning as a much more important influencing factor.

Even though progress in the world of educational technology is currently quite rapid, assessment practices in educational institutions have not changed and often use traditional methods. In the learning environment, of course there is an urgent need to form an opinion that traditional assessment is indeed outdated so that using new methods could be one way to evaluate the effectiveness of the learning environment in a smarter and easier way. Formative assessment has an effective and efficient approach. This can increase students' abilities to change from passive learners to active learners.

Learning methods in the past did have knowledge about the world of technology and information that did not fully support it. With formal studies at schools and universities, students can gain knowledge and knowledge about learning. However, now with the rise of the internet as a form of information technology, students can easily acquire and also gain knowledge much more rapidly and quickly as an informal learning method. And this means that formal learning can only reach 50% of students' learning time, according to Kinshuk et al., (2016). However, because of the blurring of boundaries between formal and informal learning and increasing attention to informal learning, the learning environment must be able to change to adapt to the rapid times. And transformation on the educational side must be able to integrate formal and informal learning in order to build a learning environment that is able to support individual learning of students

Education that emerges in any form must be able to use data such as demographics and behavior in planning, operating and teaching by offering new opportunities to expand data according to the ideas of Kwet & Prinslo, (2020). In these learning environments,

large amounts of data on student behavior can be obtained and it is important to note that the data collected can take different forms depending on the technology provided.

Therefore, by integrating data into various scenarios by building intelligent education that is centered on data, it can certainly provide a smooth learning experience with special services that are more personalized to the role of students who face big challenges according to Zhu, Yu & Riezebos, (2016 ). Collecting and using learning data is one of the challenges, while still paying attention to and also establishing relevant data protection principles and guidelines. The learning analysis process can be used to process learning data, monitor the progress of learning methods and provide feedback to the system as well as teachers and students. However, current research related to the design and implementation of learning analysis is usually found with encouragement from researchers in the fields of computer science and also decision science according to Lee et al., (2020). It has a focus on applying analytics to teach and learn more from a technological perspective than from a pedagogical perspective.

Currently, innovations in teaching and learning practices are starting to emerge at a rapid pace. Progress in the world of education which is supported by technological developments is able to bring new opportunities for the development of advanced learning environments with 2 aspects, namely performance evaluation and also learning design.

Through artificial intelligence technology which is currently popular, it has of course become one of the supporters in the world of the educational environment. The development of information technology such as the internet of things, perception technology, video recording technology, image recognition and platform acquisition technology can be one of the supports in the learning process of students This of course can produce new insights into student behavior and also learning performance in the educational environment which provides the possibility of better understanding and also optimizing the learning process in the educational environment. One of them is an artificial intelligence smart class solution built by information technology media to detect and identify positive student actions. With the help of learning analytics, an intelligent educational environment and supported by the world of technology, can monitor the student learning process and also warn students of the possibility of academic failure. In addition, there is timely and effective intervention as a learning problem, and can provide more personalized support services to students according to Pardo et al., (2019). In particular, by implementing learning that relies on technology, learning analysis can help identify students who are at risk of failing or dropping out of school who can ultimately provide special support by providing instructional design as stated by Sclater, (2017).

Instructional design in a learning environment that is supported by the world of technology, has an interactive whiteboard that can make it easier for students to control the technology which is of course compatible with the interests and needs of the world of education. These complete resources and technology can be one aspect so that all students in the educational environment have access to facilities without any restrictions. A teaching approach that is more student-centered and flexible with the help of smart technology means that active learning approaches, including inquiry learning and collaborative learning, are now increasingly being used in the world of education according to Ellis & Bliuc (2016). As smart technology advances, these more student-centered learning approaches typically become more common. With the ability to store and collect, calculate and analyze student data, it can certainly produce optimal and maximum pedagogical decisions according to Li, Kong & Chen, (2015).

A smart educational environment can certainly encourage personalized learning plans for each student. While at the same time students can interact with an intelligent learning management system as a way to adjust learning plans. Apart from interactions between students and the system, interactions between students and teachers and parents

can also be much more comfortable and timely due to the support of technology which can help teachers control students' conditions. With teaching resources that can now support a more advanced and intelligent educational environment, it is certainly possible for students to be able to carry out learning activities with their preferred learning approach as desired. Students can choose an environment that suits their psychological condition without the need for face-to-face contact which is a traditional teaching system and method.

Instructional objectives can of course be centered on research capabilities which can show that an intelligent learning environment can stimulate students' learning motivation, encourage active learning and also improve academic performance which can stimulate quite high thinking skills according to Liu et al., (2011) . With the tendency for a learning approach that is more centered on students, and also with interaction between students, teachers and parents, the learning system can be created much more comfortable and also has a lot of free space to develop and carry out learning activities.

This is of course related to communication and collaboration in their learning environment. This active learning process can of course help students gain new knowledge and can also demonstrate cognitive, behavioral and emotional skills. In order for this to be successful in supporting daily life, especially in global work, of course it must start with a foundation of knowledge and abilities that can help improve people's lives, especially students at school.

Progress in the learning process is of course able to provide new insights into the world of education. This technology can be a powerful tool and can also reorganize the learning experience based on these insights. Historically, students' educational opportunities were limited by the resources available at the school. Technology-based learning of course provides students with the possibility of maximizing these resources and skills, such as:

1. With internet access now easy to use, students can learn new knowledge, especially in the world of computers, by taking online courses at school or in informal settings that can support their potential. Even at school, students can improve their abilities and potential.
2. For students who have difficulty planning their education for college and career, they can access online mentoring and guidance programs by providing adequate face-to-face assistance with the support of the world of technology.
3. Students who are in remote geographical areas can certainly study local phenomena by collaborating with other students in conducting lessons just like in the classroom.
4. Schools that have connectivity but do not have adequate science facilities can offer virtual chemistry, biology, anatomy and physics laboratories to students with learning experiences that can support their education.
5. Students who are involved in creative writing, music and media production, can publish their work in the world of information technology so they can easily introduce it to the general public.
6. An educational environment that is supported by technology can provide opportunities for students to access and participate in special communities of practice with the aim of increasing their potential.

This opportunity has the possibility of growth for all students, especially those who are historically disadvantaged with inadequate access. This opportunity can also support capacity building for teaching staff to create integrated learning opportunities for students with the aim of advancing the world of education so that it remains advanced

In order to be globally competitive and also develop the community involved, schools must of course combine competence and expertise with a much more advanced learning experience. This includes the development of critical thinking, complex problem solving, collaboration and the multimedia communication side of the world of education

that can support them. Apart from that, students must have the opportunity to develop their potential and confidence that they can compete and compete in a global aspect.

Apart from academic competence, of course non-cognitive competence which is related to success in the academic field is one aspect that must receive attention. These non-cognitive competencies include successful navigation with tasks of building correlations and also solving everyday problems easily. This of course includes developing self-awareness, controlling impulses and executive functions towards oneself and others in the world of education or the school and community environment.

With the rapid development of technology, it is certainly important to teach students how to become digital citizens who have a sense of responsibility. We need to guide competency development using technology in a much more meaningful, productive and respectful way. And don't forget the feeling of security. Such as helping students learn to use good and correct ethics in the online world. Likewise, recognizing how personal information can be collected and used and maximizing access to the global community in order to improve the world around them. This can help prepare students to be able to successfully live their lives later. Mastering skills and developing their potential certainly requires a basic understanding of technological tools and also the ability to develop a much better assessment of their use in the world of learning and everyday life.

The principles of learning with certain technologies can be designed carefully and also implemented with full consideration. The world of technology has the potential to accelerate, strengthen and expand the impact of strong learning principles. This is because the learning process cannot be observed directly. Therefore, learning studies often produce models and conclusions that continue to develop over time because education also continues to develop. The recommendations in this plan are of course based on current assumptions and theories about how students learn by achieving a deeper understanding by relying on technology.

This helps in focusing on the role of technology that can help students build strengths from learning principles that can support their activities. The world of information technology can provide assistance to students to think about ideas by reflecting on all aspects studied and also adjusting their understanding. Technology can help and also attract the attention of students by maximizing student interest. And this can help in aligning the way of learning with the aspects being studied. There are several ways in which technology can help the world of education and also become a learning method. Technology can provide personalized experiences that are more interesting and relevant. With learning objectives where educators can design learning experiences that make it easier for students in the classroom to choose a menu of learning experiences such as writing essays, producing media, creating websites, and also collaborating with experts around the world, this can be one way to demonstrate learning they. Learning experiences that are supported by technology can be more interesting and relevant for students. Technology can help the world of education by organizing learning around challenges that exist in the real world and also project-based learning that presents a variety of digital learning tools and resources in demonstrating competency with quite complex concepts and content. Writing research reports is usually only read by teachers and their classmates. Of course, students can publish their written reports online in the hope that researchers and other community members can provide reviews and also suggestions and recommendations for their writing. In an effort to understand the construction of persuasive arguments, other students can compose, produce, and share public service announcements with online video streaming sites and ask audiences to provide feedback on what they create.

Technology can help learning go beyond the classroom and maximize the learning opportunities that exist in every aspect of education and its support. With the development of information technology, classrooms from all over the world can join in one

class and also literacy. This can of course help support other students with the experience of reading together and also build a perception of a shared, globally connected experience leading to deeper understanding. Technology can help students pursue their interests which have potential. For example, a student who wants to learn Spanish by reading works from Spanish literature so that students directly learn from the original literature. Apart from that, students can collect data and build their potential by accessing the world of information with technological developments which are now quite easy. Easily accessible technology can help close the digital divide and also provide transformative learning opportunities for all students. Adult students with limited physical access to continuing education can improve their skills and potential by utilizing and maximizing online programs to obtain new certifications and achieve these goals regardless of location or location.

The world of information technology does offer an opportunity that can integrate new technology and also advances in educational science that can enable students to access it easily. There are no limits for students to learn and can build the classroom atmosphere they want. Likewise, educators can access programs such as Google Expedition to build lessons and additional resources to create different experiences. Students can access it using Google Cardboard to experience this in the teaching and learning process. Through the Virtual Learning Lab Research and Development Center, researchers at the University of Florida research how educational technology systems can maximize large amounts of data in an effective way to adapt teaching for students in the developing world of education. The use of data from students of course has the aim of increasing mastery of basic algebra and can also develop indicators of engagement during the teaching and learning process.

Apart from that, it can be one of the professional development plans to help teachers use learning analytics to differentiate teaching and also those involved in leadership and outreach around the design of personalized virtual learning systems in the world of technology. Another role of information technology is the increased use of games and simulations that can give students experience working on a project without having to leave the classroom. Students can be actively involved in a fun class atmosphere and decide what they should do in the game by analyzing data on the problems they face. Like the RoomQuake application, which teaches students to overcome problems when an earthquake occurs. So the classroom atmosphere becomes a scaled-down simulation of an earthquake. When the sound of an earthquake is heard, students can read the seismograph simulation and examine the fault lines that appear and stretch the string as a way to identify the epicenter of the earthquake.

This learning transformation process with the development of the world of technology can of course connect physical and virtual interactions with learning technology which becomes a bridge between real and abstract things in the educational environment. The world of technology can help students, such as manipulating the physical model of a ball that emerges from a molecule such as hemoglobin. Then the camera detects the model and also visualizes related scientific phenomena such as what occurs in the energy field around the molecule.

Students who are involved with the physical model have a correlation with a much more abstract conceptual model, thus supporting the growth of students' understanding of the world of education wrapped in technology. In order to achieve similar goals, students can practice what they get from education in the world of technology into their own version of understanding. The development of information technology can help students express what they learn in the world of education. This can also be a way for teachers to support activities and also a way for students to express how they understand the learning they have learned.

One of the worlds of information technology that is quite supportive is interactive three-dimensional technology where this technology is able to create learning experiences that have transformational potential. With three-dimensional glasses and a stylus, students can learn directly and get much better information and knowledge.

One other technology is Augmented reality or AR which is a new way of investigating context and developments in the world of education. The aim of AR technology is of course so that it can be used to support learning and also critical inquiry into students' abilities. Students can use mobile devices with AR features so they can get new experiences in learning. Students can experience and use AR technology which can enable students to see and experience education from several social perspectives and see its structure and use in several time periods. This research focuses more on the potential of AR technology which is based on investigations into scientific disciplines which are considered as an analysis of change in increasing understanding of every aspect of the world of education. The learning experience supported by the world of information technology must of course be accessible to all students. Likewise for those who have special needs. Support for these learning methods must be accessible and also built into software and hardware in an easy way. This approach can include accessibility features from the beginning of the information technology development process. There are 3 main principles that can be used to encourage the application of universal design into the world of learning:

1. Provide various ways of representation so that students can get information more easily.
2. Provide various ways of expression so that students can demonstrate and also express what they have gained from the teaching and learning process.
3. Providing various means of engagement for students to stimulate interest and motivation in learning.

Digital learning tools can offer more flexibility and learning support compared to traditional learning methods. By using all aspects of existing technology, educators can of course personalize and adapt the learning experience much better so that it is in line with the needs of students. They can expand communication with mentors, colleagues and colleagues through social media. Technology can also modify content to make the learning process easier for them

## **CONCLUSION**

The development of information technology can help increase the potential and skills of students. The world of technology-based education could be the right choice to build and shift education which was previously focused on teaching staff, to students. Information technology must be easily accessible to students, especially in remote areas and also those who have special needs. Technology can be an excellent bridge to support the transformation of a much better educational environment.

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