

Teacher Innovation in Utilizing Learning Technology

Saiful Anwar*¹, Alwi 'Ainurrofiq²

¹STIT Muhammadiyah Bangil, Jl. Alun-Alun Tim. No.2, Pasuruan, East Java, Indonesia

²SMAN 2 Madiun, Jl. Biliton No.24, Madiun City, East Java, Indonesia

*saipulanwar090@gmail.com

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ABSTRACT: *Educational technology is considered a bridge to facilitate the educational process in the pandemic era to achieve the desired goals. So this research aims to analyze the use of learning technology carried out by teachers to innovate with new models or methods in learning. The research method used is qualitative. Data collection was carried out by observation and interviews. The analysis technique uses condensation, presentation, and conclusion. The results of this study are innovations carried out by teachers, including the development of the learning process from home. This indicates that teachers have tried to provide effective learning even though it is done online or remotely. Apart from that, there is also collaboration between teachers and parents, which shows the importance of cooperation between schools and parents in supporting students' learning process. Using internet-based learning media is also one of the innovations, where teachers use information and communication technology to provide interactive and exciting learning material for students. Thus, these innovations help increase learning effectiveness and ensure educational continuity amidst unusual conditions such as the pandemic.*

Teknologi pendidikan dianggap menjadi jembatan untuk mempermudah proses pendidikan di era pandemi untuk mencapai tujuan yang diinginkan. Sehingga tujuan penelitian ini adalah untuk menganalisis pemanfaatan teknologi pembelajaran yang dilakukan oleh guru dalam upaya berinovasi dengan model atau metode baru dalam pembelajaran. Metode penelitian yang digunakan adalah kualitatif. Pengumpulan data yang dilakukan dengan observasi dan wawancara. Teknik analisis menggunakan kondensasi, penyajian dan penarikan simpulan. Hasil Kajian ini adalah inovasi yang dilakukan oleh guru diantaranya adalah pengembangan proses belajar dari rumah. Hal ini mengindikasikan bahwa para guru telah berupaya untuk menyediakan pembelajaran yang efektif meskipun dilakukan secara daring atau jarak jauh. Selain itu juga kerjasama antara guru dan wali murid siswa, yang menunjukkan pentingnya kolaborasi antara sekolah dan orang tua dalam mendukung proses pembelajaran siswa. Pemanfaatan media pembelajaran berbasis internet juga menjadi salah satu inovasi yang dilakukan, dimana guru menggunakan teknologi informasi dan komunikasi untuk memberikan materi pembelajaran yang interaktif dan menarik bagi siswa. Dengan demikian, inovasi-inovasi ini membantu meningkatkan efektivitas pembelajaran dan memastikan kontinuitas pendidikan di tengah kondisi yang tidak biasa seperti pandemi.

Keywords: *Teacher Innovation, Utilizing Technology, Learning Technologies.*

I. INTRODUCTION

At the end of 2019, China was attacked by a disaster in the form of a disease outbreak which then in 2020 turned into a pandemic disease whose transmission rate was relatively high, various

countries felt the impact, this was no exception for Indonesia, which hurt all important aspects of a country, one of which is the economy and tourism, and even has hurt the progress of the education process since this pandemic spread in various provinces in Indonesia, which resulted in the government finally giving regulations to all public and private schools to carry out distance learning, namely by studying at home, and work at home. Even though students are at home, educators must ensure that learning activities continue well and smoothly. The solution requires educators to design learning media as innovation by utilizing learning technology, one of which can be done by using online media (Ikhwan, 2021b).

As stated by the Ministry of Education and Culture, studying at home and working at home for the education sector is intended so that teachers and students can create learning systems realized with computers or other gadgets connected to the Internet. Educators can use various social media or platforms as learning media to recognise a joint learning process. Therefore, even in different places, educators can ensure that their students take part in learning simultaneously. Educators can also complete measurable tasks based on the objectives of the material presented to students (Anwar, 2023).

The Covid-19 pandemic period can be said to be one of the clues and opportunities in finding new strategic innovations in the learning process in the field of education, especially in using information and communication technology as a learning strategy, because remembering that this rapid technological development cannot be separated from people's daily lives (Ikhwan et al., 2020). Wherever they go, almost all of them carry smartphones or even laptops. In line with this, many places now provide accessible internet facilities. Of course, this makes it easier to access information whenever and wherever they want. From this problem, pressure emerged to use technology in the learning process because internet-based technology is expected to be able to make the distance learning process easier (Solviana, 2020).

Through the use of learning technology in education, a generation of intelligent, skilled and independent children will be born, intellectually and emotionally, to achieve the development of this country. However, during the COVID-19 pandemic, public debate has been about how the learning process will work well. Of course educators and students feel burdened by this. Educators are required to be creative and innovative in making appropriate strategies, one of which is innovation in providing material through media, one of which is online learning and preparing as best as possible in learning technology. This also needs to be adjusted to the level of education required. This is one of several promising innovations developed by PAI teachers at SMAN 2 Madiun so that education can still be delivered to students. Even though this may be difficult to implement, this is the only way to be an intermediary in providing education in the midst of a pandemic like the current one so that it can run well (Anwar & Zukhrufin, 2023).

Previous studies discussing material that has several similarities can also be used as research guides, including research conducted by Riana Rahmi examining various innovations carried out by teachers to find solutions so that learning can run well. The research results show that teachers are trying to find innovations, including learning from home: school collaboration with students' parents, learning as an opportunity and a challenge, and Blended Learning as a learning model (Rahmi, 2020). In Meita Dwi Solviana's research, educators are trying to design learning media as an innovation to utilize online media, which has online gamification features. His research increased the effectiveness of learning activities by 69%, so the online gamification features from these results were considered a solution for enjoyable learning (Solviana, 2020).

Research conducted by Salsabila, the use of the Google Classroom, YouTube, WAG, Edmodo, Zoom and Googlemeet platforms from this research shows that the use of technology in this kind of learning is beneficial in teaching and learning activities during the Covid-19 pandemic (Salsabila et al., 2020). Research by Erwin Suryaningrat discusses how educators use the Internet as a learning strategy, considering that it is commonly used by teachers and students today because it offers many facilities supporting the teaching and learning process (Suryaningrat, 2014). Therefore, the author hopes to use this article to learn more about various innovation strategies in the learning process involved in implementing the teaching and learning process during the coronavirus disease (Covid-19) pandemic. By finding promising learning technology innovations, they are hoped to become effective strategies. Facilitate achieving the desired learning goals in the current pandemic era.

II. METHOD

This research used a qualitative case study approach by taking cases at SMAN 2 Madiun City, East Java. Observation and interviews with the teachers concerned were carried out for data collection. This research aims to determine the extent of teacher innovation in utilizing learning technology in the era of the Covid-19 pandemic to carry out smooth learning to achieve the desired learning goals. The data analysis technique adopts the Miles Huberman technique of data collection, condensation, display, and verification. Data was collected by tracing and searching various sources, including mass media documents, interviews, and previous research that was considered relevant and then analyzed. Data can be condensed based on categories, such as the type of learning technology to be used, student needs, or the availability of technology infrastructure. The data display can be a report or presentation that includes information about the learning technology used, the reasons for selecting the technology, and the expected benefits. Verification also involves reviewing the planned use of learning technology, whether it is to student needs or the learning objectives to be achieved (Ikhwan, 2021a; Miles et al., 2014).

III. RESULT AND DISCUSSION

Learning Technology Area

There are many opinions regarding the definition of educational learning technology, one of which has been explained by M. Yaumi in his book *Media and Learning Technology*. That etymologically, the word Technology is taken from the Greek *Techne* which means skills and knowledge, so it can also be understood as knowledge related to skills. Meanwhile, in terms of terminology, M. Yaumi quotes Spector's term in his book which refers to technology, namely an easy way or strategy to provide knowledge. Meanwhile, learning itself can be interpreted as an interactive process carried out by several people, teaching resources and learning aids to produce helpful knowledge to develop potential and channel the interests of individual students (Yaumi, 2018).

Learning technology is a method deliberately created by humans to make it easier for other people to obtain practical knowledge that is useful for themselves or other people around them, and this knowledge is used as a learning resource. The teacher's position here is as a facilitator, guide, and instructor responsible for learning design and making learning activities easier for

teachers and students. In M. Yaumi's book for understanding learning technology used in the scientific field, there is the latest definition from the Association for Educational Communications and Technology (AECT) which states that: "Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Yaumi, 2018).

The new definition above means that educational technology is a study and ethical practice in efforts to provide facilities for the learning process and improve performance with strategies for creating, using and managing appropriate technological processes and resources (Rahmi, 2020). As for learning activities, the definition of educational technology or what is now known as learning technology can be understood as a way of operational activity with a system to help and make it easier to solve and resolve teaching and learning problems for students and educators (Aliwar, 2013).

Thus, there are several things regarding the definition of understanding learning technology that we need to know and conclude, including the following:

1. Learning technology is a scientific field of study or collaborative or personal activity to support achieving desired goals.
2. The definition of learning technology is used and equated with the definition of educational technology.
3. Learning technology has two objectives, namely: as an effort to resolve problems related to the learning process and also regarding efforts to provide learning facilitation and as an effort to increase and improve performance.
4. Systemic is the chosen approach (meaning comprehensively or holistically carried out systematically).
5. The area or scope of learning technology includes several activities related to analysis, design, development activities, utilization, management, implementation, and evaluation, including learning processes or resources.
6. Educational technology is also essential in solving learning problems and improving performance; learning technology involves school education and all forms of human activity (such as companies, families, community organizations, and so on). The last thing is to define technology broadly, not only physical technology (hard tech), but also including soft technology (soft tech) (Warsita, 2013).

The area or scope of learning technology is based on the definition from AECT 1994, which is that learning technology has five fields of science, including design, development, utilization, management and evaluation. These five things constitute the field of learning technology. Next, we will explain several things that are included in the field of learning technology among the five fields, which will be described briefly as follows:

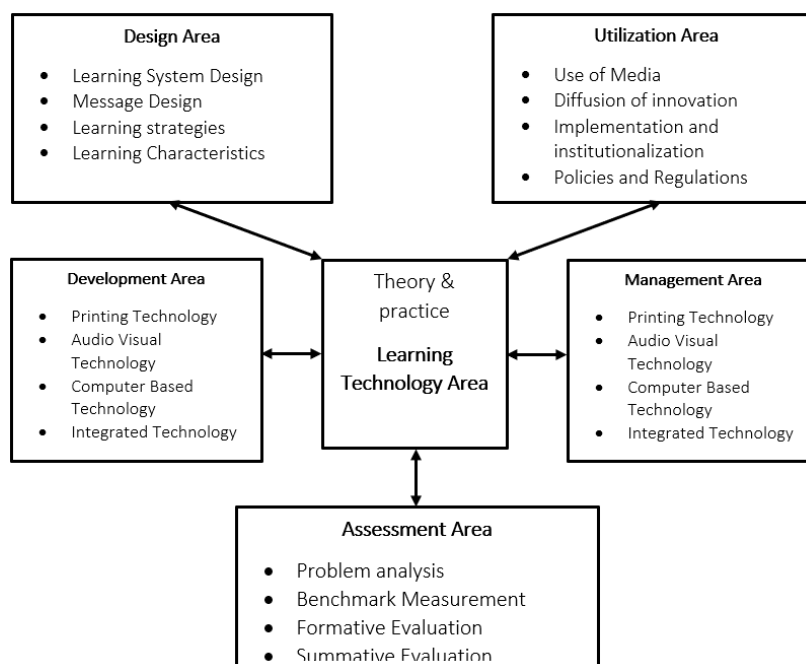


Figure 1. Learning technology area diagram (Seels & Richey, 2000)

1. Design area

This first area includes applying ideas, principles and procedures in planning learning activities that will be carried out sequentially according to the system. So this area is a method used to determine the conditions of the learning environment to implement strategies and to achieve learning outcomes (Warsita, 2013). So this first area includes applying various theories, principles and procedures in systematic planning or designing learning plans or activities to achieve the desired goals. As Seels and Richey also explain, the design area is a process of activities determining learning conditions, which aims to create strategies and products (Seels & Richey, 2000).

In his book Warsita, this area of design or planning was the forerunner or beginning of the founding of the learning psychology movement, which had several factors that triggered it, first, the field of design Skinner began with the learning psychology movement, which was inspired by programming learning theory or programming guidelines. Second, Herbert Simon's thinking about design specifications also leads to research on design areas (Warsita, 2013). Next, the discussion regarding the area or scope of this design itself covers several areas, including four primary areas of theory and practice, these areas include: (1) learning system design, (2) message design, (3) learning strategies, and (4) student characteristics (Seels & Richey, 2000).

2. Development area

According to Seels and Richey, this area includes several important things, including the first development area of printing technology, the second is audiovisual technology, and the third is the area of computer and multimedia-based technology. This area of development begins with media production. So after several years of development, changes in media capabilities have brought changes to this region. Even though the development of print technology such as books and other learning tools existed before films, the emergence of cinema was an early milestone in the history of the audiovisual movement in the era of learning technology.

Within the scope of this development area, there is a complex relationship between technology and theory, which drives the design of messages and learning strategies. The reasons for the emergence of this development field are: firstly, the message is driven by content. Secondly, learning strategies are driven by theory; fifthly, the physical manifestation of technology, including hardware, software and learning materials. The scope of this development area includes: a) Print technology, b) Audiovisual technology, c) Computer-based technology, and d) Multimedia.

3. Use or utilization area

Utilization or use itself is a form of action using media materials and equipment to improve the process of learning activities. So in this area it has an essential function because it discusses learning and the learning process (Warsita, 2013). The function in this use area is vital because it concerns the relationship between students and the learning system or materials. Those who become educators have the responsibility to provide unique learning materials and activities to students, prepare students to be able to interact with the learning materials and activities they choose, guide them during the activity process, evaluate student learning outcomes, and also include selecting the organization that appropriate and sustainable for students.

There are several important things regarding the scope of development of the area of utilization of learning technology, including: 1) media utilization, the process of utilizing activities is to choose or select media and plan its use activities so that they are by the learning design that will be carried out. 2) Diffusion of Innovation is a process of communication activities between educators in determining planned strategies to be used in the learning process. 3) Implementation and institutionalization are the activities of using materials or materials and strategies in the learning process in a state that is not stimulated. So, the implementation and institutionalization aim is to ensure proper use by individuals in the organization. Institutionalization aims to incorporate innovation into the structure of an organization. 4) Policies and regulations are a form of regulation. Things like this impact the spread and use of learning technology, just as government rules or regulations will also affect the use of technology.

4. Management area

This management area includes controlling learning technology in various ways: planning, organizing, coordinating and supervising. Project management methods are starting to be implemented, especially regarding instructional design. Learning from other fields means it is necessary to continue developing project management techniques or procedures. Because every new development requires new management methods too, as recently happened related to Covid-19 due to scattered locations, the distance learning strategy will depend on the process of how it is managed. With modern technology, it is possible to birth new ways in the world of education to transfer or obtain information.

There are several areas in this management area, including project management, in the form of planning, monitoring or providing information, and control activities for project design and development. Second, resource management includes finances, learning materials, time, facilities and learning resources. Third is delivery system management, which pays attention to product problems in the form of software and hardware and technical support to users or

operators. These four information management matters are essential because they have the potential to give birth to a curriculum revolution and applications related to learning design.

5. Evaluation or assessment area

The assessment area is an activity process to determine how learning has been achieved. Its scope includes, First, analysis of problems related to the learning process that was previously sought and then planned to find a solution. Second, benchmarks are measured by how far students' affective, cognitive, and psychomotor scores have been achieved. Based on the desired learning objectives. Third, formative assessment and summative assessment are the processes of seeking information regarding how well students have completed their learning. Formative assessment aims to improve learning activities. This is done because schools need it to develop learning programs, and summative assessment is usually carried out. At the end of each time, determining student achievement in the form of grades this is done to measure students' abilities (Ikhwan, 2020; Warsita, 2013).

Teacher Innovation in Using Learning Technology

The 2019 Coronavirus Disease pandemic has had a very detrimental impact on various aspects of life in multiple countries, including Indonesia, one of which is felt in the education sector, where the government finally decided to implement a distance learning policy or the term learning from home which is carried out online. Online, this is done to break the chain of spread of Covid-19, which has been stated by WHO that this viral disease can spread very quickly (Puspitorini, 2020).

Members of educational institutions felt this policy because it had never been imagined by educators anywhere, giving rise to new academic problems related to distance learning. Many students lost their motivation to do PJJ, so issues like this encouraged educators to do so. Innovation includes efforts made by teachers at SMAN 2 Madiun to find solutions and strategies so that learning continues even though it is not done face-to-face between teachers and students, one of which is by utilizing learning technology because learning technology has a role in (Salsabila et al., 2020):

1. Learning technology is a form of tool for knowledge design
2. Learning technology is a way to obtain information to support student knowledge
3. Learning technology is a medium for facilitating student learning.
4. Learning technology can increase effectiveness and efficiency in learning activities
5. Learning technology is a tool that makes it easier to achieve educational goals.

From the several roles conveyed, it is hoped that innovation in utilizing appropriate learning technology will facilitate the process of carrying out learning activities to achieve the desired goals. The following are the results of innovation that PAI teachers at SMAN 2 have been able to produce in improving the learning process carried out online or online in the era of the Covid-19 pandemic, including:

1. Development of the learning from home process

Through the government's policy through the Ministry of Education and Culture of the Republic of Indonesia (Kemendikbud), learning during the Covid-19 pandemic is carried out online from home. This is a new culture of learning that has never been done before by all educators. For

students in Indonesia, this was done to break the chain of the spread of the Covid-19 virus (Sudarsana et al., 2020), so teachers must carry out various innovations so that distance learning from home can run well.

The process of learning from home is a new challenge for educators, especially since the Learning from Home policy which is implemented in almost all educational institutions in Indonesia is a form of learning activity which for SMAN 2 had never previously been planned, even though modern schools often use learning application facilities such as *Edmodo*, *Ruang Guru*, *Google Classroom* and so on are distance learning tools. Therefore, teachers at SMAN 2 Madiun are encouraged to innovate how to design distance learning that can be implemented to deliver learning material well in accordance with the desired expectations.

As the SMAN 2 Madiun school, the role is as a learning designer, namely how to ensure that learning can still be carried out well with learning activities from home. The facilitator is trying to provide facilities for online learning by providing internet data quotas, the government also provides this, supervisors and also evaluators. Learning, while parents have a role as implementers and companions in learning activities for students (Saputri et al., 2022).

There are several learning-from-home innovations that schools have implemented to improve the learning process, including:

- a. Collecting assignments in the form of learning notes (summaries) or student papers can be sent directly via Google Classroom to the respective classes created. Those who don't have a smartphone or laptop can collect them directly at school every Monday and Saturday.
- b. Attendance is carried out online daily on the SMAN 2 E-Learning page created daily by the school.
- c. Teachers must creatively use media and creatigandearning resources. Therefore PAI teachers are encouraged to actively use YouTube facilities as a learning resource, not only that PAI teachers are also required to be able to make videos related to learning material, this is intended so that students who have an audio-visual type of learning can understand the content of the material well.
- d. Students are expected to actively read material from textbooks or worksheets, including participating in learning by asking questions and expressing opinions when learning occurs through comments in Google Classroom.
- e. Students who still need help understanding the material can ask the teacher directly via the WhatsApp application or in the Google Classroom comments column. If they still have difficulty, they can now meet the teacher concerned at the school at a particular time when the teacher is on duty following health protocols.

2. Collaboration between parents and teachers

The transformation of learning from Face-to-Face to online learning suddenly resulted in the discovery of obstacles both by educators and students, such as ownership of smartphones, the ability to use them, and the problem that is often encountered is student inactivity in participating in learning. online learning is an obstacle that teachers often encounter, this is one form of decreasing student motivation to learn, therefore teachers try to build collaboration

between parents of students and teachers, this is done in the hope that parents will be able to guide their children to continue participating in online learning carried out by teachers.

Furthermore, to avoid the problem of student inactivity in participating in online learning, SMAN 2 teachers take action to improve communication and collaborate between teachers and student parents, because parents, one of the parties, have a very important role and are able to have a large impact on the success of the process. their children's learning (Valeza, 2017). Therefore, to improve communication between parents and children and also with teachers, the SMAN 2 Madiun school implemented a strategy to record all WhatsApp numbers of student parents who entered them into the WhatsApp group to provide guidance and advice.

Furthermore, the actions taken by the school were not limited to that, at the beginning of learning from home, meetings were held using internet-based applications such as Google Meet, parents of students who could not participate would be given photos in the form of important notes related to collaboration between teachers and parents. This is deemed necessary to be done with the hope that student parents will always try to remind and provide learning guidance to their children to continue following the learning carried out by teachers at SMAN 2 Madiun, and this continues to be done until now so that the learning process can be carried out well and smoothly.

3. Utilization of internet-based learning media

With this policy from the government, SMAN 2 Madiun tried to innovate in learning activities by utilizing all forms of Internet facilities. Initially, PAI teachers carried out learning by reading the material themselves and then giving assignments via the *WhatsApp* application, but this was deemed not to have a slight learning impact. Media is one of the tools that can support learning activities in the pandemic era. The success of the learning activity process is also determined by the appropriate way to use media, so that media can be used as a tool to transfer messages from education to students so that it can stimulate the mind, including students' attention and interest, making the teaching and learning process easier (Atsani, 2020).

By seeing the development of students' understanding of the use of smartphones and laptops, sometime later, the teacher used *Google Classroom* as a medium for delivering learning, starting with notes sent by the teacher and then summarized by the students as a form of assignment. The teacher tried again to develop the design. Learning, namely by making learning planning strategies using online telecommunications interface media, uses *Zoom* and *GoogleMeet* to be carried out on certain subjects so that students have a good understanding. Although *Zoom* and *GoogleMeet* have been used, *Google Classroom* is still being used. Still, there are several changes in the making of material, namely by sending YouTube videos as a learning resource to make it easier for students to understand the material. Even PAI teachers also deliberately make their videos, then upload them to their YouTube account, then the teacher shares the link with students via *Google Classroom*. Not only that, teachers are also required to be creative in making PowerPoint presentations either directly via the *Zoom* and *GoogleMeet* applications or when making videos to upload on YouTube. Because the use of appropriate media greatly influences students' understanding of the material presented (Adrianus et al., 2015).

The explanation above is a form of activity that is in line with the area of learning technology development, such as efforts to update printing technology in this school, providing textbooks and worksheets as resources and the teaching materials given to students are the most recently

published, even during a pandemic like the current one, the use of audio technology visual, computer-based technology and multimedia such as providing and developing learning videos either from YouTube or teachers making them themselves is a form of innovation in the development area that is often used, of course during distance learning this is essential to strengthen students' understanding of the learning material.

Although in the early days of implementation many factors were obstacles such as the availability of data packages or smartphones owned by students, as time went by schools provided data packages which were also part of the Ministry of Education and Culture's program for studying at home, while students who did not have smartphones were in the minority. They then have it for a specific time because many smartphones are classified as affordable. However, for students who do not have smartphones, the teacher suggests going to a friend's house with health protocols to open the material that the PAI teacher has sent.

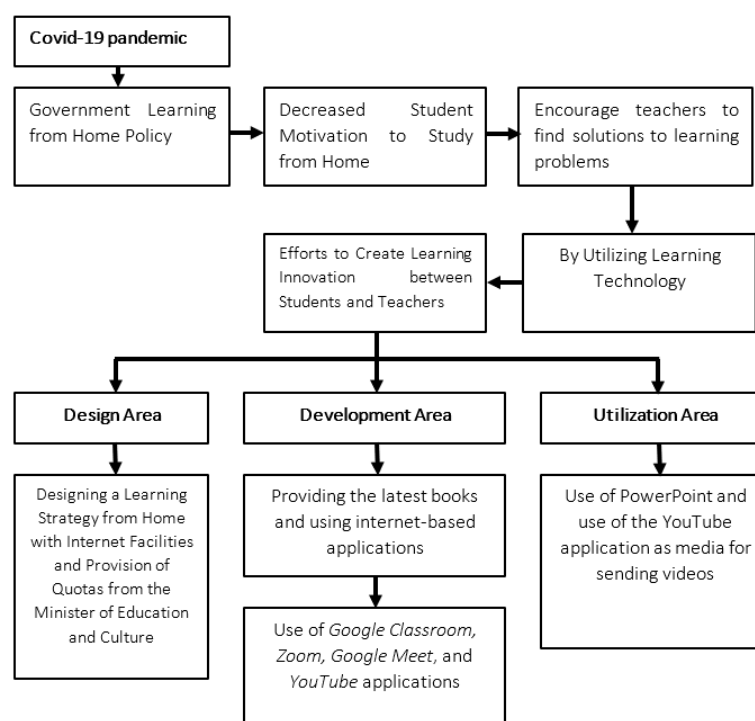


Figure 2. Research Results Diagram

IV. CONCLUSION

Learning from home during the outbreak of the coronavirus pandemic is a new problem in the world of education, not all students have good motivation when studying from home, this is a form of challenge that encourages teachers to think more creatively in designing learning process plans, including This also urges teachers to produce appropriate innovations, one of which is utilizing learning technology which is considered capable of making it easier to achieve the desired learning goals, by developing existing learning resources and learning media, then making efforts to utilize existing technology such as the current availability of internet facilities. Indonesian citizens are already better known, considering that the Internet can help solve learning problems, especially during a pandemic like this, which requires students and teachers not to be able to meet face to face. Innovations carried out by PAI teachers at SMAN 2 Madiun

to simplify the learning process and to increase student motivation include: First, developing the learning process from home by preparing several school policies, it is hoped that it will be able to foster students' motivation to learn, one of which is through structured assignments and attendance activities with E-learning that the school has provided. Second, collaboration between teachers and parents is done so that parents of students can guide and remind their children to actively participate in online learning. It was third, utilize internet-based media because the internet is considered capable of bridging activities in the teaching and learning process, with various platforms such as Zoom, Google Class, Google Meet, etc.

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