

Renewable Technology in The Homeschooling System as an Innovation in Learning

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ABSTRACT This research is related to innovations that support new learning methods, a more flexible place, a pleasant atmosphere, freedom of thought, focus on individual goals, monitoring, and evaluation to create innovations to improve the quality of learning. The research method used is the grounded theory qualitative research method. Researchers can draw generalizations of what is observed/analyzed inductively and abstract ideas about processes, actions, or interactions based on the views of the participants being studied. The basis for homeschooling modifications in systems research is a combination of private tutoring, tutoring, and schools then added innovation to the fun learning concept, namely learning that is comfortable, getting grades, and having competence. The development of learning for advanced Indonesia is very much needed in this 5.0 era. Homeschooling in the 5.0 era has proven to be good because it is very efficient regarding time, energy, thoughts, etc. Homeschooling on learning includes: homeschooling trains students to innovate and be exploratory. Homeschooling in education makes students able to develop their potential.

KEYWORDS –homeschooling; learning; superior; value

I. INTRODUCTION

The times are very demanding for changes in the world of learning, especially learning. Knowledge is not only about academic development, but the most important thing is character education. One of the most valuable assets is humans. Humans can control a system in the world because only God can create humans. Learning techniques that have been in the classroom for a long time can cause boredom, especially when students are sometimes eager to interact and focus on one of the teachers they use as role models in chatting, exchanging ideas and asking questions, and discussing exciting things [1]. The development of information technology is currently reaching all areas of people's lives, including learning. In the era of the industrial revolution 4.0, three literacies are needed: data, humans, and technology [2]–[4]. Learning in the 4.0 revolution era can apply hybrid/blended learning and case-based learning.

Even learning in the era of society 5.0 allows students to participate in learning activities side by side with a system designed to replace the role of educators [5]–[7]. Because the purpose of learning is not a matter of time but comfort and consistency with what students have to face in the future, we will discuss PISA scores that can affect learning in Indonesia [8], [9]. At the annual meeting of the World Economic Forum, Alibaba Group CEO Jack Ma stated that learning is the big challenge of this century. If we don't change how we educate and teach, then in the next 30 years, we will experience great difficulties. Anwar Nadiem Makarim, Minister of Education and Culture, delivered his remarks at the peak of the 2019 National Teacher's Day commemoration and PGRI's 74th Anniversary, "Teachers Moving Indonesia Forward, Realizing Superior Human Resources [10], [11]." Reading helps improve self-confidence, develop the ability to manage emotions, and increases the ability to carry out positive social interactions anywhere and anytime [12], [13]. Therefore,

one alternative to this problem is homeschooling private tutoring to improve math, science, and reading skills.

The online learning process is also carried out at the elementary school level through parental guidance [14]–[17]. In online learning, the learning and teaching process is more student-centered, innovative, and flexible. Online learning is a learning experience using technological devices such as mobile phones and laptops with internet access. In this case, students can be anywhere to learn and interact with teachers and other students [18], [19]. In online learning, where digital technology is used for learning, the majority use Zoom Meeting as a medium for face-to-face meetings, and several institutions use Google products such as; Gmail, Google Forms, G-Drive, and Google Classroom. These products help record sessions in file form [20]–[22] (Kristina, 2020). These technological facilities have been successfully used as an alternative to face-to-face classes [23], [24]. However, there are several challenges in the online learning process, such as distance from the residence and supporting facilities such as internet networks and learning tools, namely laptops or mobile phones, which not all regions and children can provide. Nakayama stated that not all students would be successful in online learning [23], [24]. This is due to the factors of the learning environment and the characteristics of students.

The spread of this virus impacts all aspects of life, especially in education. There has been a drastic change in education since the beginning of 2020. The most dominant learning activity, face-to-face learning, must switch to online learning. This change is one of the efforts to prevent the transmission of Coronavirus Disease 2019 (Covid-19), which is attacking Indonesia and other parts of the world. Following Circular No. 4 of 2020 concerning implementing Education Policy in the Emergency Period to implement distance learning.

By utilizing this online learning system, various problems are being experienced by students and teachers, such as limited material to be delivered so that the teacher replaces it with assignments. Another problem is uneven internet access because online learning relies heavily on internet access [25], [26]. Few students submit assignments late due to inadequate internet access [27], [28]. Therefore, the teacher's work is multiplied by correcting the tasks given to students. Therefore, educators who have to rethink the application of learning methods that were initially prepared must be replaced with online learning [29], [30].

The progress of a nation can be seen in the quality of the next generation of the government itself. So the next generation of quality is produced from a quality education system. So that education becomes a long-term investment for the younger generation to determine the progress of a nation. This is following the Indonesian National Education System Law Number 20 of 2003 article 1 paragraph 1 "Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble character, and skills needed by himself, society, nation, and state."

So in an emergency like this, alternative learning is needed to increase the quality of online education, which has several shortcomings. One alternative is homeschooling. According to (Muhtadi, 2010), homeschooling is an alternative school by trying to place children as a top priority with an at-home education approach.

II. METHOD

The approach used in this research is qualitative research, referring to the scope of innovation and learning, learning technology. The research objects include; the researcher's experience with the students and students who have been taught underlying the focus of this research, among others, an industrial revolution that requires us to turn to advanced learning. Some places used for this research include managed educational institutions, tutoring institutions, and students' private homes taught by private teachers. In addition, researchers also research the needs that must be met for future education.

Although many researchers deal with students, teachers, and co-workers, some students and co-workers or teachers are pretty close to researchers who can be invited to think together for superior learning innovations.

Research materials include students who want to be investigated more deeply in a question-and-answer manner, and research instruments only use writing appliances and gadgets that support research. Therefore, the data collection technique was based on the researcher's observations. The analytical technique used is the discourse analysis technique to analyze the interaction of people the difference between the two lies in focus.

Discourse analysis qualitative research methods focus more on the social context in which respondents and researchers communicate. The sequence in the research includes a literature study by first searching for supporting library sources so that the analysis becomes vital because of several supporting references. Furthermore, discussions with people who care about the world of education so that the research focus is more specific. Likewise, comparative studies regarding the efficiency of homeschooling on learning, in general, are considered to be used as data and supporting evidence.

III. RESULT AND DISCUSSION

One of the critical concepts of homeschooling is learning that does not occur through formal school institutions [31], [32]. Knowing in the era of society 5.0 allows students or students to learn activities side by side with robots designed to replace the role of educators. The following will explain the 5.0 era in Figure 1 [33].

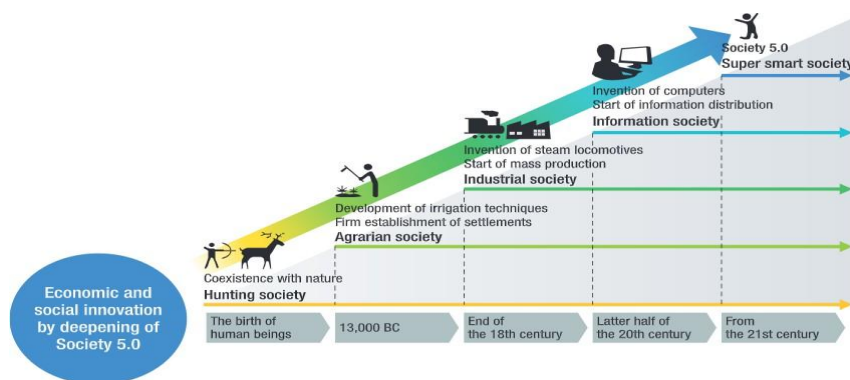


Figure 1The era of society 5.0 [34], [35]

The cultural aspect of reading a lot is essential because to achieve relevant math, science, and global competition scores, a reasonably high (good) reading level is required. Reading can also be used as a spiritual activity for self-development so that people who read a lot have a pretty good personality. The following will be explained in Figure 2 regarding the PISA indicator pattern.

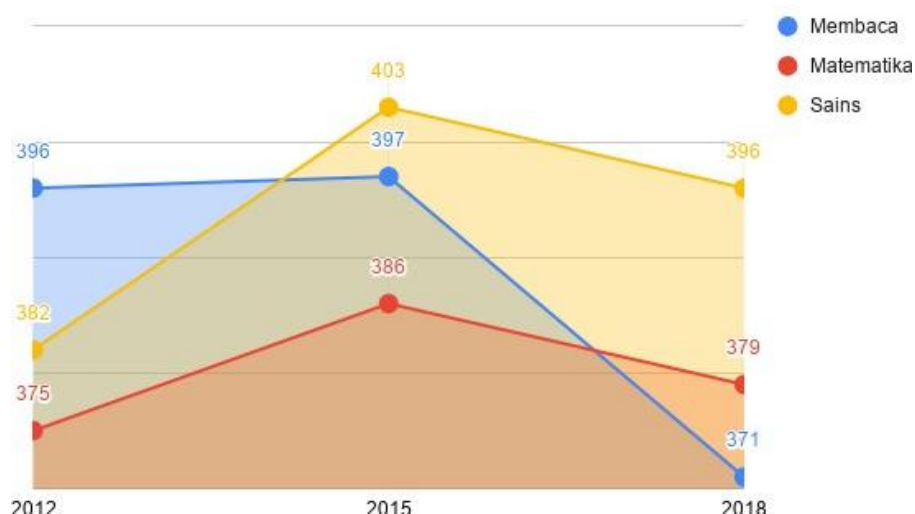


Figure 2PISA indicator pattern [8], [9]

Reading culture is very necessary because reading is the basis for someone to start daring themselves

in facing scientific disciplines [10]. Unfortunately, Indonesia is in crisis in the world of education. Especially our neighboring countries have educational values above us [33], [36]. In the world of education, Indonesia is still below Malaysia. Homeschooling breakthroughs are needed so that each teacher focuses on only one student, and students do not hesitate to determine their idol figure. The following will explain the development of digital learning in Figure 3 [37]–[39].

The digital era is used in the emergence of digital internet networks, especially computer information technology. The digital age itself is often used to describe digital technology. The internet has become familiar to people [40], [41]. Nowadays, the internet has become part of our daily needs, as if we can't live without the internet. The rapid development of the digital era today helps the world community to provide accessible services and unlimited coverage. Along with the rapid growth of technology, internet users worldwide also soared [9], [42].

Moreover, the millennial generation cannot be separated from what is called digital technology, both in daily life and in business activities. The First Industrial Revolution was marked by mechanizing production using water and steam power [43]. Then, mass production became an open possibility thanks to electric power in the second industrial revolution. The industrial sector can then realize production automation in the third industrial revolution due to the support of the electronics and information technology industry [44], [45]. All these changes encourage humans to adapt because, in the end, they will change their behavior and ways of working to the demands of skills [9], [46].

There are so many challenges in business development in this modern era. Products in the digital age, especially in the business world, namely with the many e-commerce in Indonesia. As you already know, e-commerce is a platform for buying and selling goods and services through a digital system [47]. For those still unfamiliar with this term, Peer to Peer Lending (P2P Lending) is the practice or method of lending money to individuals or businesses and vice versa, applying for loans to lenders, which connects lenders with borrowers or investors online.

P2P Lending allows everyone to provide loans or apply for loans from one another for various purposes without using the services of a legitimate financial institution as an intermediary. P2P Lending is very similar to an online marketplace, which provides a place for the battle between buyers and sellers.

Indonesia has entered an era of digitalization and automation. However, not all societal elements are aware of these changes' impact [32], [48]. The facts of the change are still often debated. Many conventional shops are politicized with a tendency to decrease people's purchasing power. Shops have minimal visitors because some urban communities prefer an online shopping system.

The digital industrial era will continue to bring many changes. Therefore, there is urgency if the state needs to make maximum efforts and be more aggressive in understanding all elements of society about the nature of the Industrial era. This step is important because not many are interested in understanding the age of industrial digitization. Concern for the challenges in the current generation of digitalization and automation is still relatively minimal.

The digital era is when everything is easy and has no limits. In the digital age, any difficult job will likely become easy. Even now, many events do not require participants to come [49]–[51].

There are lots of online courses that can be followed. There are even universities that provide online lecture facilities. So students do not have to bother gathering in class. The students also need to apply the same thing. They only need internet access so they can communicate with each other like a class. In this day and age, the internet is more required than telephone credit in general. The digital era is a sign of the progress of the internet. But sometimes, the internet is used as an opiate, although the impact is good or bad depending on the individual who undergoes it. The business world is so fast in the digital era. Even digital era games can be used as a business in digitalization progress [52].

To avoid opium that has a negative impact, it's good to think a little wisely that the internet is used to facilitate problems or life activities that are difficult for us to deal with because we use technology that is quite traditional. Indeed, in overcoming the destructive influence of the internet, it is not only seen as bad but how to use it properly so that it is not wrong. But once in a while, we need to leave a little world of activities with the internet, so we don't forget to be grateful for the beautiful gifts from God. There are so many natural beauties that cannot be measured through digital devices that can

only be grateful for with senses from God [53], [54].

In preventing excessive addiction to the era of digitalism, people must flashback to a time when they could still live or so many other joys that can be found even without the internet. We cannot completely abandon the internet today because it is the most incredible power in the world. Recreation in a real place needs to refresh the brain so that it is not fixated on the virtual world [55].

Digital literacy is a learning platform for absorbing digital information-based communication science, which refers to scientific data with valid sources as the data used for the intended reference source of information quoted from the digital literacy supporting materials of the Indonesian Ministry of Education and Culture, a digital literacy researcher named Douglas A.J. Belshaw stated in his thesis that there are eight essential elements for developing digital literacy, including culture, namely understanding the various contexts of users of the digital world.

Cognitive, namely the power of thought in assessing content. Constructive, namely the creation of something expert and actual. Communicative, namely understanding the performance of networks and communications in the digital world. Responsible confidence. Creative, doing new things in new ways. Critical in addressing content. Socially responsible. With the development of digital equipment and flooded access to digital information, digital literacy skills must be mastered by internet users [5], [39].

It was recorded through research published by wear social. In 2017 there were 132 million internet users in Indonesia, with a growth rate of 51% in just a year. As one of the countries with the most significant number of internet users in the world, the development of the digital world in Indonesia has two opposite sides to the growth of digital literacy.

It's good in the millennial era, and accessible technology development, especially in the digital age, is needed in a constantly evolving generation because if you don't understand information technology well, it will be challenging to explore data. Along with the development of technology in the digital era, there are many opportunities and challenges in this era. For example, with the relatively high internet use, the media or the government in Indonesia should be good at choosing which news or information is suitable for public consumption .

Thinking skills are the ability to think critically based on the concept of skills, knowledge, and actions. Thinking skills can be used based on different spaces and times. The knowledge gained will be in vain if there is no thinking skill. The frame of mind is also a driving idea for innovation. In the academic world, thinking skills must be based on scientific thinking so that the concept of thinking is more rationally directed. Learning with a scientific approach is a learning process with the idea of knowing the background, studying literature, conducting research methods, determining research results, and making conclusions [56], [57].

As for the forms of student behavior found in homeschooling, two of them are: students are not very obedient in terms of time management, such as not spending time on the lesson schedule, not all students follow the lesson to the end, and some students take classes while doing other activities. In addition, the student's enthusiasm, concentration, and attention were not very good. This can be seen in students taking notes while listening, passively asking, and answering the teacher's questions. Nevertheless, the student's responses in discussions and responding to problems were quite good. Students are more enthusiastic after following the homeschooling learning model and appreciate teachers more.

Meanwhile, the impact felt by students, including students who find it difficult to understand the material because of the delivery in online learning. Students prefer face-to-face meetings (such as pre-pandemic learning). Students are not comfortable with some technical constraints or the learning environment, such as; signal, home atmosphere, etc. Unfortunately, sometimes teachers don't understand the situation. Students feel tired, stressed, bored, and stressed quickly due to the many tasks that must be completed almost simultaneously.

The situation and condition of homeschooling in one of the research locations can be seen in the following picture.



Figure 3 Student activities in the homeschooling system (1)

The picture above shows how the implementation of the activity takes place. Each study group consists of six to five children and three accompanying students. The action occurred in one of the residents' houses while observing the health protocol. The children seemed enthusiastic and eager to come and learn. They said that it had been a long time since they had studied with friends and that the group learning atmosphere with the help of their seniors made them happy and eager to learn. This is in line with findings that online learning has become difficult for students to follow. Ultimately, it gives rise to boredom, laziness, and even discouragement [25], [58]. One of the efforts to overcome this problem is to improve the quality of learning by changing the learning method to make it more interesting, fun, and well absorbed by students. This is what is applied in this activity. Furthermore, by combining games and learning, the children are increasingly enthusiastic about keeping coming to study every time the learning schedule takes place.



Figure 4 Student activities in the homeschooling system (2)

To see the achievement of the results of this activity, the younger students continued to accompany the children until the semester exams were completed. Because the implementation of this activity is close to the elementary semester exams, we also provide test simulations or tryouts for children to understand better the material and tests that the school will hold. The test results showed satisfactory results, and most children admitted that they understood their lesson better and hoped this activity would continue. They were enthusiastic and actively participated, including children and residents who helped run this activity.

The determinants of the success of homeschooling as an alternative education model

In implementing homeschooling, it is essential to look at the factors that can encourage and support the implementation of homeschooling in learning the necessary elements, namely teachers, students, and parents. These three factors are interrelated regarding the performance of homeschooling. The first is the teacher. In implementing homeschooling, a teacher can master the current curriculum system, namely the 2013 curriculum. Therefore, teachers have an essential role in the process of implementing learning. The second is students. Students must be able to divide the study time and how to study well. Lastly, parents. This third factor is very influential because, in this implementation, parents significantly influence encouraging and supporting their children.

Several requirements must be met by parents who want to implement the homeschooling education model so that it runs by the goals of homeschooling education itself, including 1) loving children, 2) being creative, 3) being patient and sympathetic with children, 4) understand the needs and desires of children, 5) know the abilities and interests of children, 6) willing to listen and negotiate, 7) willing to change, flexible, and responsive, 8) understand the physical, psychological, and mood conditions of children, 9) have the willingness to want to know the competency standards and content standards of the national curriculum that have been recognized and approved, 10) have a time commitment to study with children.

Implementation of homeschooling in learning

In this implementation, there are several well-known homeschooling models in Indonesia, namely (1) single homeschooling, which only involves parents and children so that the time is more flexible, and (2) multiple homeschooling, in which parents choose to be a companion or mentor. In addition, their children implement learning, (3) the Homeschooling Community is a combination of multiple homeschooling to compile related matters relating to homeschooling.

There are several characteristics in homeschooling in general, namely 1) The primary education emphasizes the formation of personal character, developing talents and interests, 2) Learning activities are carried out independently, both with parents, tutors and communities who organize homeschooling, 3) Parents

must be able to play the role of motivators, teachers, and facilitators in carrying out their learning activities, 4) The existence of tutors as mentors in the implementation of homeschooling and develop student interest in the preferred material, 5) In the implementation of learning activities carried out flexibly, meaning that it can be done anytime and anywhere, 6) Flexibility in determining the number of each meeting, for example 50 minutes and so on, 7) A more personal and humane learning approach, 8) Provide opportunities for students regarding interests, needs, duration of material ownership and intelligence them, 9) The National Examination can be carried out to when students are ready to face.

Positive and Negative Impacts on Learning in a Pandemic Period

The implementation of learning during this pandemic experienced several difficulties. It also refers to distance learning. Distance learning is the implementation of learning that is not face-to-face in the classroom. In addition, distance learning is the leading choice during this pandemic. Several tools facilitate distance learning, including email, blogs, Wikipedia, e-portfolios, animations, and video links to social networks, such as Facebook, Twitter, youtube, google classroom, Edmodo, and so on. Learning with several tools is very flexible, economical, and can be used anywhere.

According to Distance education is an answer in the form of educational innovation for learning resources that vary from the availability of learning resources [6], [58]. Through Distance Education, students have more free time and comfortable learning situations. Students can also take advantage of several online applications such as zoom, google meet, and WhatsApp to support communication and interaction during learning. It can be seen that the impact of COVID-19 has affected the teaching and learning process, which usually teachers and students study in class face to face, but now everything has shifted to virtual and online. The uneven technology infrastructure makes it difficult for underprivileged students to communicate while studying.

In distance learning, many students are less skilled in using ICT. Because not all students get used to it from an early age, according. There are several obstacles to e-learning. Namely, electricity can go out when accessing learning programs, poor internet network, erratic commitment from parents, students/students who find it challenging to learn this way, and misunderstandings between lecturers. /teachers and students, and ignorance of science and technology. Teaching and learning activities during this pandemic have many impacts and difficulties. The effects felt by students include the limitations of technology for underprivileged students as a means of learning, students need to make an effort to spend money on internet quotas, not all parents support online learning, and students feel tired of not being able to interact with their peers, and lack of student creativity. With less varied education.

In addition to having a negative impact, homeschooling has several positive effects. Among them are students who are more conducive because teachers can condition students who only number 4-5 people, the material presented makes it easier for students to understand the material, parents feel helped by homeschooling, and learning can be done anywhere and anytime. According to Olivia [31], [59], there is a homeschooling learning model. Namely, homeschooling can help to fully explore the capacity of children's intelligence abilities (maximum) because each child has diversity and uniqueness of interests, talents, and different skills as well as actions that are more active in interfering with children's education and take full responsibility in providing an interest in learning. So, in this case, parents take part in supervising, encouraging, cultivating, and developing the capacity of children's abilities directly.

Private institutions that open tutoring have started to open certified homeschooling and can be used as a source for efficient education development. A system like this does not need to bother students having to go to school because, in school, only teachers can monitor student performance while studying. In contrast, a private-based homeschooling development system will be more effective because it is monitored directly by parents or family at home.

When you finish studying, you can immediately consult if your parents want it. The following is an explanation of the differences in the homeschooling development system based on the experience of researchers compared to ordinary schools, which will be explained in table 1.

Table 1
 Differences in Homeschooling Development System Compared to Ordinary Schools or Other Tutoring Institutions

No	Information	Homeschooling Development	School in general
1	Time efficiency	Tailored for students and parents	Bound with school rules in general
2	Teaching Style	Flexible as long as students are comfortable	Even though it is flexible, it has its own standards
3	Disease Transmission	Minimal transmission of disease because only dealing with one teacher	Vulnerable to disease transmission due to dealing with many people
4	Initial fee	No building money	There is building money
5	Study duration	Can be customized	Bound with the existing system
6	Punishment	There isn't any	There is a standardized penalty
7	Evaluation	Applications according to the character and potential of students	It's pretty stiff because it's a comparison of values with friends' values
8	Payment	According to location, level, student character, tutor qualification, and teaching duration	Must be on time because there are sanctions such as not being allowed to take an exam
9	New job for prospective teachers	Very tempting because it is flexible	Full of competition because of the teacher contract for one semester
10	Ascension system	Learning achievement target	Can you not go to class?
11	Homework	Should not	Must be done
12	Scientific publications	Must be good in any form	There isn't any

Tutoring focuses on consulting subjects at all levels of education, from elementary to high school. However, the development of a homeschooling system can compete with tutoring and private tutoring institutions that provide learning services. The following describes the comparison between the development of the homeschooling system with private institutions and tutoring, which will be explained in table 2.

Table 2 Comparison between Homeschooling System Development with Private Institutions and Tutoring

No	Information	Homeschooling Development	Tutoring	Private Tutoring
1	Time	Adapt to students	Follow the rules of tutoring	Suitable for students but routine
2	Certificate	There is	There isn't any	There isn't any
3	Certificate	There is	There isn't any	There isn't any
4	Payment	Count per session	Package	Count per session
5	Periodic time	Nothing but	routine	Maybe not, and maybe yes

6	Curriculum	School with flexible style	School in general	School in general
7	Brainstorming	Exist and customize students	Seldom	Sometimes there
8	Pass time	Suitable for schools in general	There isn't any	There isn't any
9	Random Material	Can suit students	According to the school curriculum	According to the school curriculum
10	Target	Students discover the character and achievement of school competencies	Good grades, state school, excellent school	Good grades, state school, excellent school
11	Cooperation	With private practitioners or other professions	If there is only the scope of research	There isn't any
12	Research	Preferred	No	No

This system is similar to the number one Learning system in the world, namely in Finland, where the weakness of our Learning system is more restrictive for students. But, at the same time, Finland has created a learning platform that is so free, efficient, and flexible so that students can appreciate what they want or are interested in.

IV. CONCLUSION

The homeschooling system in the 5.0 era has proven to be good because it is very efficient in terms of time, energy, thoughts, and so on. What's interesting about the homeschooling system compared to the usual learning system is that it trains students to think innovatively and exploratively because what is their potential will be devoted to only one teacher. Therefore, students can participate in training they like according to their talents and aspirations. At the same time, teachers must attend training that supports the competence of the times, learning, and technology so that teachers are required to conduct research for a progressive Indonesia.

The homeschooling system does need adaptation to the existing learning system. And of course, there are many problems regarding this system that prioritizes character learning but still meets targets like school levels in general. This system combines private tutoring, tutoring, and school, then added innovation with the concept of fun learning, namely learning as long as you are comfortable and then pursuing the value of competence.

In the future, this research must be continued and applied by practitioners of mathematics education because the theory based on the concept must be tested immediately to improve the idea of sustainability of this research. Furthermore, teachers must cooperate with lecturers because with teachers who are also researching, elementary and secondary learning in Indonesia continues to advance.

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