Analysis of E-Learning Activities as School Learning Media in the Era of Society 5.0 Using Big Data

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Abstract: To prepare the community to face Society 5.0, cooperation is needed from various parties, including the education sector. The development of the education sector is crucial today, as it provides optimal and quality educational services and facilitates technological advancements. Regarding educational technology, a system utilized to support learning and achieve desired outcomes, it is important to associate it with the Society 5.0 era. One form of technological development in education that can be used as a learning medium is e-learning. This research adopts a quantitative approach. The research subjects consist of secondary data from a Kaggle dataset titled "Students Adaptability Level in Online Education," which was collected by Md. Aktaruzzaman Pramanik and Nishat Ahmed Samrin. The data includes 530 students who participated in online learning at schools. The results of this research indicate that the development of information technology in the Society 5.0 era can be utilized by the education sector, such as through e-learning as a learning medium. The impact of these research findings can be observed in the quality of education in Indonesia, where all aspects of life coexist with digital media.

Abstrak: Dalam rangka mempersiapkan masyarakat untuk menghadapi Society 5.0. Tentunya dibutuhkan kerjasama dari berbagai pihak salah satunya dari dunia pendidikan. Perkembangan dunia pendidikan saat ini sangat penting, karena tidak hanya memberikan layanan pendidikan yang optimal dan berkualitas, tetapi juga memberi layanan dalam perkembangan teknologi. Dalam kaitannya dengan teknologi pendidikan yaitu suatu sistem yang dimanfaatkan untuk menunjang pembelajaran, sehingga tercapai hasil yang diinginkan penting untuk dikaitkan dengan era Society 5.0. Bentuk perkembangan teknologi dalam pendidikan yang dapat digunakan sebagai media pembelajaran adalah e-learning. Penelitian ini menggunakan pendekatan kuantitatif. Subjek penelitian yang akan digunakan dalam penelitian ini adalah data sekunder yang diambil dari kaggle dataset yang dimana dataset nya yaitu Students Adaptability Level in Online Education yang telah dikumpulkan oleh Md. Aktaruzzaman Pramanik dan Nishat Ahmed Samrin. Data yang diambil sebanyak 530 siswa yang mengikuti pembelajaran online di sekolah. Hasil penelitian ini menunjukan bahwa perkembangan teknologi informasi pada era society 5.0 dapat digunakan oleh dunia pendidikan seperti media pembelajaran dengan e-learning. Dampak dari hasil penelitian tersebut yaitu dapat dilihat dari kualitas pendidikan di Indonesia yang di mana semua kehidupan sudah berdampingan dengan media digital.

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A. Introduction

Countries around the world are currently facing the industrial revolution 4.0, including Indonesia. The industrial revolution 4.0 is an innovation that fully uses or implements information and communication technology. Or it can be said as robotization technology. Artificial intelligence and the Internet have largely replaced the role of humans. Therefore, from this industrial revolution comes concern for the role of humans in life. Therefore, the industrial revolution 5.0 or better known as Society 5.0 emerged. Society 5.0 is an innovation in the world of technology that aims to solve problems that arise in the industrial era 4.0. Society 5.0 is a concept of society introduced by the Japanese government (Skobelev & Borovik, 2017). This society concept uses human-centered technology (Shiroishi et al., 2018). Society 5.0 uses super technology with the Internet of Things (IoT), big data (BD), and artificial intelligence (AI). The existence of new technologies always impacts the need for experts in the field of systems engineering. New training programs must also be implemented to improve human resources in this field (Mext, 2020).

The implementation of the society 5.0 era creates several new literacies. The first is data literacy. Data literacy is the ability to read, analyze and utilize or use big data in the digital world. The second is technological literacy. Technological literacy is an understanding of the work of machines and technology applications (coding, artificial intelligence, machine learning, engineering principles, biotech). The third is human literacy. Human literacy is related to communication and design. From the above literacies, a combination is made that requires everyone to continue learning and developing. In other words, Society 5.0 is an era where society will try to keep up with the presence or advancement of technology. This aims to overcome the social inequality that exists in society. In order to prepare people to face Society 5.0.

To do this, of course, requires cooperation from various parties. One of them is the world of education. The development of education is currently facing a very important period. Not only in an effort to provide optimal and quality educational services, but also in technological developments. This era of society has provided opportunities and challenges for educators every year. To answer the challenges of Society 5.0 in the field of education, 21st century life skills are needed or better known as 4C (Creativity, Critical Thinking, Communication, Collaboration). Teachers are expected to be creative, able to teach, educate, inspire and be role models. Schools as an educational component must be able to facilitate virtual learning for students and teachers so that learning objectives are achieved. Innovation and variation in the use of learning methods can be a solution to answer educational challenges. Some subjects may require little movement and physical contact (Cahapay, 2020), such as subjects in vocational schools. For this reason, it is necessary to assess the school's ability to facilitate learning and teacher readiness (Obana, 2020). Education is required to be creative and innovative to develop learning by utilizing

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technology. With this technology, it is hoped that educators can create an active, innovative, comfortable and fun learning process. So that there is interaction between educators and students, students and students, students with media and learning resources.

In facing the era of society 5.0 as an educator, you will definitely find challenges. This is inseparable from the various opportunities that are used as a way to educate generations to be more competitive in the era of unlimited globalization. Teachers' challenges are so complex in facing the era of society 5.0 which is increasingly echoed in Japan which will certainly have an impact and influence on Indonesia. With that, teachers must be able to face the challenges that exist with optimal abilities and special qualification standards in educating students in the era of society 5.0 (Abidah et al,. 2022).

The form of information technology development that can be used as a learning medium is e-learning. E-learning is an innovation that can be used in the learning process, not only in the delivery of learning materials, but also in changing the ability of various competencies of students. Through e-learning, students not only listen to the teacher's explanation of the material, but also actively observe, act, demonstrate, and so on. Teaching materials can be visualized in various formats to make it more interesting and dynamic so that it can motivate students to go further in the learning process. E-learning has changed conventional teaching and learning into internet-based or online learning. E-learning is an educational system or concept that utilizes information technology in the teaching and learning process, in times and conditions like this the role of e-learning in the scope of education is very important because it facilitates the online teaching and learning process. One of them is in terms of delivering material from collecting assignments and others.

Of course, the Society 5.0 era has both positive and negative impacts for all of us. The rapid changes in science and technology require us to be ready to face world changes, especially in the field of education. Character Education is needed as a guide for Generation Z to face the current Era Society 5.0. Because in an increasingly advanced era, in the era of the industrial revolution 5.0 all sectors will be more advanced. If the world of education is not ready and follows the rapid development of the times, then education in Indonesia will be left far behind. One of the trends associated with society 5.0 in education is to provide learning according to student choice (Fisk, 2017). In this context, students have the right to determine how they learn so that they have different skills according to their field of interest. The problem is usually the lack of teachers' digital media and skills (Onyema et al., 2020). Teachers must be more creative and innovative in giving assignments to students. One of the efforts is to create new innovations in learning methods (Cahapay, 2020). It is better if online learning is implemented collaboratively so that students can participate and improve cooperation skills, motivation, satisfaction, and attitudes towards technology use (Julià & Antolì, 2018; Shonfeld & Magen-nagar, 2020). Conceptually for a better online learning environment, school teachers must prepare a learning process that brings students into the world of work according to the challenges

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and needs of the times. Many facts in the field doubt the competence of teachers in the field of study they teach and in other fields (Mulyadi, 2019).

In relation to educational technology, namely a system that is used to support learning, so that the desired results are achieved, it is important to be associated with the era of Society 5.0. Therefore, this article will further examine the analysis of e-learning activities as a learning medium in the era of society 5.0 by using big data.

B. Method

This research estimates e-learning as the primary medium for school learning in the Society 5.0 era. The study uses a quantitative approach to use secondary data from the Kaggle website (www.kaggle.com). The dataset used is "Students Adaptability Level in Online Education," which was collected by Md. Aktaruzzaman Pramanik and Nishat Ahmed Samrin. The credibility of the data is ensured as it was gathered through online and offline surveys conducted in schools and higher education institutions between December 10, 2020, and February 5, 2021. This approach was chosen to expedite the research process, as it allows for quick access to the dataset without requiring field research for data collection. The following datasets were employed in this research.

```
df = pd.read_csv('students_adaptability_level_online_education (1).csv')
print(df)
```

```
     Gender    Age Education Level Institution Type IT Student Location  \
0       Boy  21-25      University   Non Government         No      Yes
1      Girl  21-25      University   Non Government         No      Yes
2      Girl  16-20         College       Government         No      Yes
3      Girl  11-15          School   Non Government         No      Yes
4      Girl  16-20          School   Non Government         No      Yes
...     ...    ...             ...              ...        ...      ...
1200   Girl  16-20         College   Non Government         No      Yes
1201   Girl  16-20         College   Non Government         No       No
1202    Boy  11-15          School   Non Government         No      Yes
1203   Girl  16-20         College   Non Government         No       No
1204   Girl  11-15          School   Non Government         No      Yes

     Load-shedding Financial Condition Internet Type Network Type  \
0              Low                 Mid          Wifi          4G
1             High                 Mid   Mobile Data          4G
2              Low                 Mid          Wifi          4G
3              Low                 Mid   Mobile Data          4G
4              Low                Poor   Mobile Data          3G
...            ...                 ...           ...         ...
1200           Low                 Mid          Wifi          4G
1201          High                 Mid          Wifi          4G
1202           Low                 Mid   Mobile Data          3G
1203           Low                 Mid          Wifi          4G
1204           Low                Poor   Mobile Data          3G

     Class Duration Self Lms  Device Adaptivity Level
0               3-6       No     Tab         Moderate
1               1-3      Yes  Mobile         Moderate
2               1-3       No  Mobile         Moderate
3               1-3       No  Mobile         Moderate
4                 0       No  Mobile              Low
...             ...      ...     ...              ...
1200            1-3       No  Mobile              Low
1201            3-6       No  Mobile         Moderate
1202            1-3       No  Mobile         Moderate
1203            1-3       No  Mobile              Low
1204            1-3       No  Mobile         Moderate

[1205 rows x 14 columns]
```

Figure 1. The Dataset

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A total of 1,205 data points were obtained; however, only 530 data points were selected for this study. The selection was made by filtering the data based on the level of education in the schools. The filtered data includes:

```
df2=df[df["Education Level"] == 'School']
print(df2)
```

```
     Gender    Age Education Level Institution Type IT Student Location  \
3      Girl  11-15          School   Non Government         No      Yes
4      Girl  16-20          School   Non Government         No      Yes
5       Boy  11-15          School   Non Government         No      Yes
6       Boy  11-15          School   Non Government         No      Yes
7       Boy  11-15          School   Non Government         No      Yes
...     ...    ...             ...              ...        ...      ...
1188    Boy   6-10          School   Non Government         No      Yes
1191    Boy  11-15          School   Non Government         No      Yes
1194    Boy  11-15          School   Non Government         No       No
1202    Boy  11-15          School   Non Government         No      Yes
1204   Girl  11-15          School   Non Government         No      Yes

     Load-shedding Financial Condition Internet Type Network Type  \
3              Low                 Mid   Mobile Data           4G
4              Low                Poor   Mobile Data           3G
5              Low                Poor   Mobile Data           3G
6              Low                 Mid          Wifi           4G
7              Low                 Mid          Wifi           4G
...            ...                 ...           ...          ...
1188           Low                Rich          Wifi           4G
1191           Low                 Mid   Mobile Data           3G
1194           Low                 Mid   Mobile Data           3G
1202           Low                 Mid   Mobile Data           3G
1204           Low                Poor   Mobile Data           3G

     Class Duration Self Lms  Device Adaptivity Level
3               1-3       No  Mobile         Moderate
4                 0       No  Mobile              Low
5               1-3       No  Mobile              Low
6                 0       No  Mobile              Low
7               1-3       No  Mobile         Moderate
...             ...      ...     ...              ...
1188            1-3       No  Mobile         Moderate
1191            1-3       No  Mobile         Moderate
1194            1-3       No  Mobile              Low
1202            1-3       No  Mobile         Moderate
1204            1-3       No  Mobile         Moderate

[530 rows x 14 columns]
```

Figure 2. Filtered Data

Technical data analysis uses descriptive statistics (Hasan, 2016) to describe and provide information about the data and the situation. This research analyzed students' adaptability to online learning based on gender, age, electronic devices, internet type, place of residence, financial class, and flexibility in adapting to e-learning. The data was processed using Ms. Excel to facilitate the analysis process, which involved creating graphs based on the collected data. The results were presented in graphs or diagrams and objectively described to reflect the reality of the situation.

Figure 3 shows in more detail the methodology used in this study.

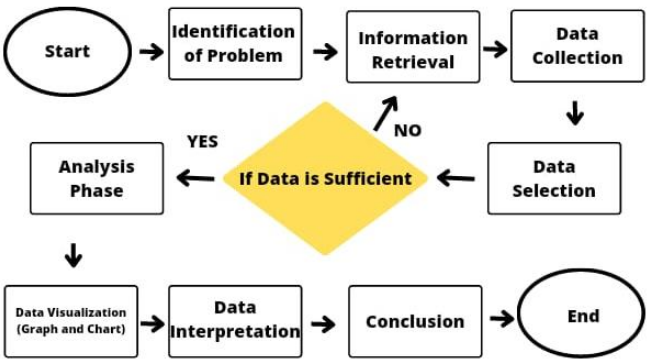

Figure 3. Research Flowchart

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C. Result and Discussion

Result

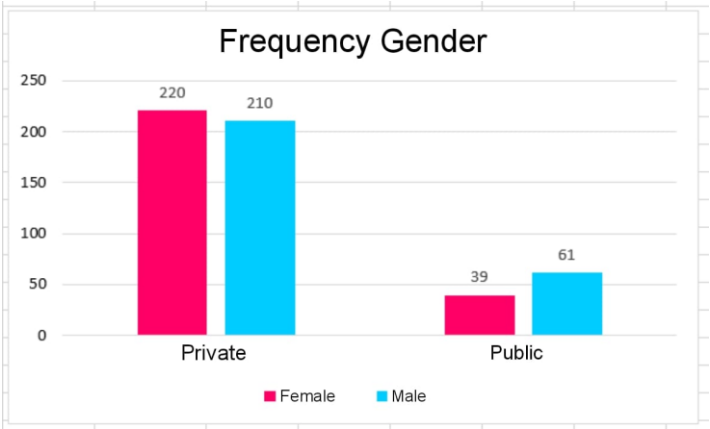

Figure 4. Frequency Gender

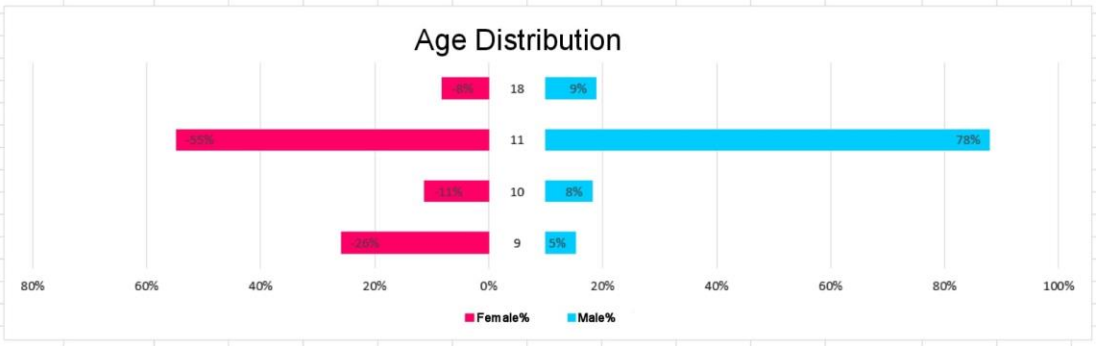

Figure 5. Age Distribution

The provided data includes the participation of 530 students from various schools involved in online education as the sample. Among them were 259 girls, with 220 students attending private schools and 39 students attending public schools. On the other hand, there were 271 boys, including 210 students from private schools and 61 from public schools. Notably, a significant number of students, totaling 430, came from non-governmental institutions, while 100 were from governmental institutions.

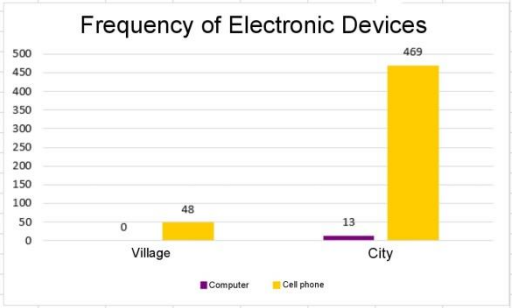

Figure 6. Frequency of Electronic Devices

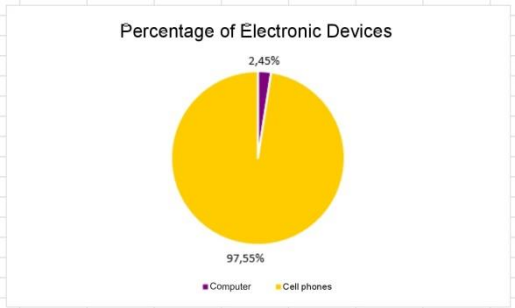

Figure 7. Percentage of Electronic Devices

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In terms of electronic device usage, it was observed that out of the total of 530 student participants, 48 students from villages used cell phones, while none of them used computers. On the other hand, in the city, 469 students used cell phones, and 13 students used computers. Based on these figures, the percentage of electronic device usage was calculated, resulting in 2.45% for computer usage and 97.55% for cell phone usage. The participation of students from the city was significantly higher, with a total of 482 students, compared to the 48 students from the village.

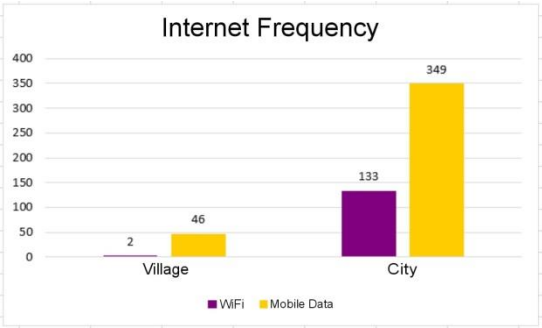

Figure 8. Internet Type Frequency

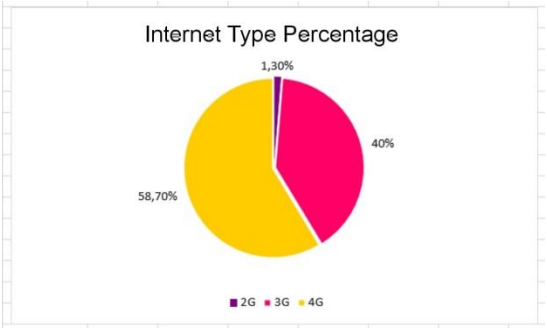

Figure 9. Internet Type Percentage

Regarding internet usage type, it was observed that out of the total of 530 student participants in the village, 46 students used mobile data while 2 students used Wi-Fi. In contrast, 349 students used mobile data in the city, and 133 students used Wi-Fi. Based on these figures, the percentages for each internet type were calculated: 1.30% for 2G, 40% for 3G, and 58.70% for 4G.

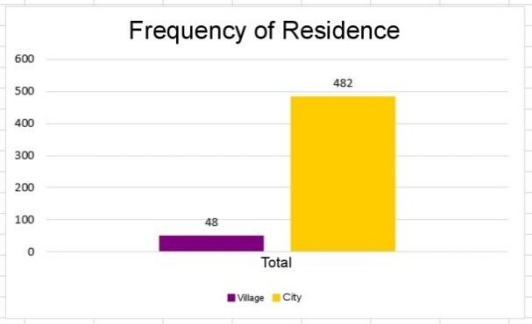

Figure 10. Frequency of Residence

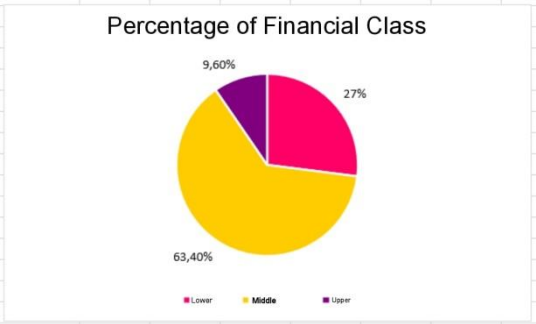

Figure 11. Percentage of Financial Class

In terms of the place of residence, it was observed that out of the total of 530 student participants, 48 students lived in villages, while 482 students lived in cities. Then, the percentage of financial groups was calculated, resulting in 9.60% from the upper class, 27% from the lower class, and 63.40% from the middle class.

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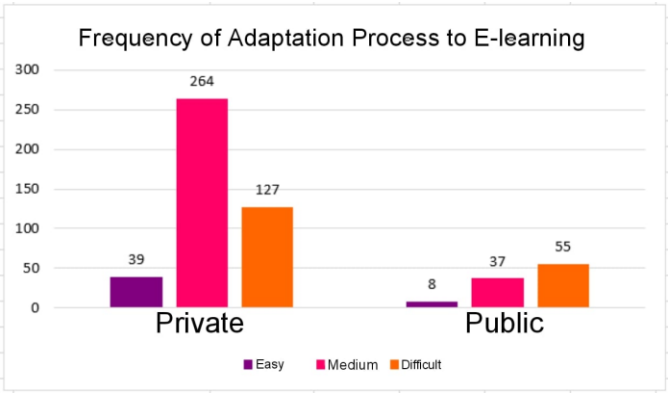

Figure 12. Frequency of Adaptation Process to E-Learning

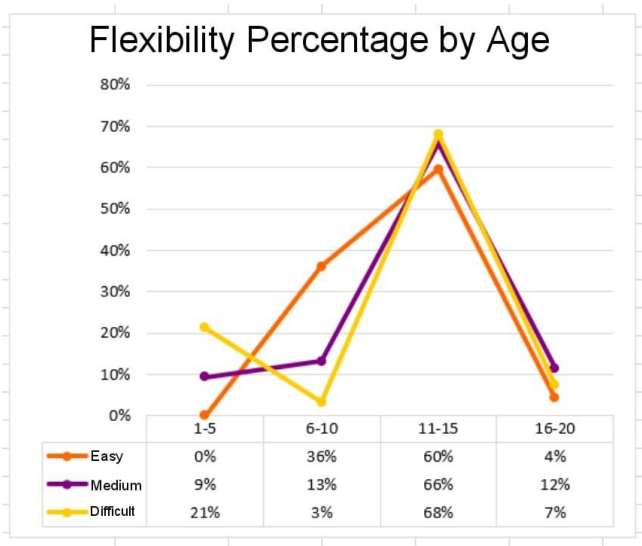

Figure 13. Flexibility Percentage by Age

In terms of adaptability to E-Learning, it was found that out of a total of 530 student participants, 47 students found it easy to adapt, 301 students found it moderate, and 182 found it difficult. The details of E-Learning adaptation in the private sector showed that 39 students found it easy to adapt, 264 students found it moderate, and 127 students found it difficult. On the other hand, in the public sector, 8 students found it easy to adapt, 37 students found it moderate, and 55 students found it difficult.

Then, the percentage of flexibility based on age was calculated. For the age of 9 years, it was found that 0% felt it easy, 9% felt it moderate, and 21% felt it difficult. For the age of 10 years, the percentages were 36% for easy adaptation, 13% for moderate adaptation, and 3% for difficult adaptation. For the age of 11 years, the percentages were 60% for easy adaptation, 66% for moderate adaptation, and 68% for difficult adaptation. For 18 years, the percentages were 4% for easy adaptation, 12% for moderate adaptation, and 7% for difficult adaptation.

Regarding the adaptability level of students in online education, 271 boys and 259 girls were involved in the study. Non-government institutions comprised 430 students,

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while government institutions comprised only 100 students. The study ensured a balanced gender variable with equal males and females to obtain relevant results. It was observed that males showed higher adaptability to new knowledge, while the level of poor adaptation was approximately the same between men and women.

The best adaptation was observed in the age range of 6-10 years, while the worst was 1-5 years. Poorer adaptation in the younger age group can be attributed to social and physiological factors, as children aged 1-5 tend to be more inclined towards traditional rather than online learning. Online learning at this age may hinder their socialization and communication with peers.

Students with no difficulty in online learning were mostly from the middle financial bracket, which is unsurprising as they had access to adequate facilities. The urban residents also showed better adaptation, which can be attributed to economic, social, and technological factors that make online learning less challenging than in rural areas. The Internet connection quality plays a significant role in online learning, as students need a reliable network for prolonged periods.

Based on the analysis, it is evident that online learning can be used as the primary learning medium in schools, as it brings progress to the education sector. Utilizing technology, such as accessing a Learning Management System (LMS) containing materials, questions, assignments, and discussion rooms, allows students to access learning materials anytime and anywhere. The increasing number of smartphone users, including school children, can be leveraged to provide interactive media through e-learning or online learning platforms.

Discussion

Adaptation refers to the behavioral changes individuals make to fit their surrounding environment. Calista Roy's adaptation theory sees humans as holistic beings engaging in continuous interaction with the environment. This interaction requires individuals to maintain their integrity by adapting to environmental changes. The environment, comprising internal and external conditions, shapes individual behavior. The external environment encompasses physical, chemical, and psychological factors, while the internal environment includes personal attributes such as experiences, abilities, emotions, and personality. Humans constantly interact with their environment, exchanging information, materials, and energy, influencing and influencing the surrounding environment. Successful interaction enables individuals to feel comfortable and achieve self-adjustment. Calista Roy's theory identifies four adaptive models for achieving individual integrity: physiological, self-concept, role, and interdependence (Alligood, 2013).

Jean Piaget's theory of cognitive development states that biological adaptation to the environment is a component of intelligence. Piaget presents three aspects of intelligence: the structure and organization found in the environment, the human mind's

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active interaction with the outside world, and incorporation of the external world into the individual's mental framework (Tangkudung, 2014).

Research findings indicate that most subjects discussed continuous adaptation to learning. The data also suggest that men are more adaptable to new knowledge, while the level of poor adaptation between men and women is roughly similar. Other studies support these findings, indicating that men adapt better to the learning process than women. Local culture and stereotypes associate the male gender with faster adjustment due to an adventurous spirit, whereas women may face greater difficulty due to emotional factors. The ability to overcome obstacles during the adjustment process depends on individual characteristics (Tangkudung, 2014).

Distance learning by utilizing electronic learning cannot be called an ideal learning condition. There are still various obstacles so that learning has not run optimally. Efforts made by the government in the problems that occur in distance learning, namely improving in terms of regulations, increasing the readiness of educators, and expanding networks and access to learning resources, so that it can run effectively and efficiently. However, these efforts need to be continuously improved so that distance learning using electronic learning is not only for emergency conditions such as when spreading a virus outbreak, but can be carried out in normal situations according to learning needs (Basar, 2021).

Distance learning also creates many controls for students, such as for students who do not have gadgets, quotas, low internet signals. This unusual electronic learning concept requires a lot of habituation for both teachers and students. Habituation for teachers, namely participating in webinar activities regarding the implementation of distance learning, is expected to have an impact on student learning motivation (Sukmayanti et al., 2021).

The inhibiting factors in creating an academic atmosphere in distance learning, namely the evaluation of student learning outcomes whether students do their own or other people's assignments so that students' abilities are difficult for teachers to know, inadequate internet network constraints, frequent power outages, not all children have smartphones and include internet credit, some students do not collect or send assignments given by the teacher so that the teacher has difficulty giving grades (Wiranto et al., 2021).

Current online learning still has many barriers that make learning ineffective. The online learning atmosphere is not able to control student behavior so that the measure of educators' success in changing behavior cannot be measured. For early childhood students, it will be difficult to follow online learning, because in early childhood children are in a period of exploration because they usually cannot stay still and are easily bored. Teachers will have difficulty communicating with early childhood students if only through a screen, because early childhood needs a direct approach to form a learning atmosphere to run effectively.

In addition, ineffective online learning can be caused by technical and strategic aspects. Technically, online learning requires technology such as computers and

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cellphones with specifications that support online learning. The technology requires a source of electricity to support the learning process. Meanwhile, in the village, there is often a power outage in a short period of time. Then other supporters must have a data package or WiFi to be able to connect to online learning. Whereas in the village there is also still a lot of lack of strength from the signal transmitter for the use of this internet. Strategically, online learning is very efficient because it is easy and does not take much time for many people to join the learning process. Online learning can be done by anyone and anywhere. In addition, students can also make savings because they do not spend a lot of money to attend the classroom.

The use of technology in education is also influenced by several factors, namely economic factors, geographic factors, and social factors. Economic factors are related to the cost of providing technology facilities and internet networks, where from the results of research students in the middle and upper financial groups are superior in adapting to educational technology. Meanwhile, the lower financial class is less optimal in adaptation. This is due to the availability of technology facilities and internet networks. Geographical factors influence educational technology and this makes a difference to students who live in cities and villages. Students who live in cities find it easier to adapt to educational technology, because the internet network in cities is evenly distributed and stable. Meanwhile, students who live in villages, especially for remote villages that still lack technology, will find it difficult to adapt to educational technology, because the internet network is less stable and uneven. This condition makes students feel social inequalities with the online learning model. One of the positive impacts for this online learning is to bring students and the community to recognize and utilize technology.

One of the online learning that can be used as learning media is e-learning. E-learning Framework is developed by Sun Microsystem. E-learning is defined as the ability to use the internet, computer networks, and other electronic technologies to facilitate, measure, and manage learning activities. E-learning is attractive because it reduces or even completely eliminates two major barriers to learning: time and cost. E-learning is supported by technology services. The characteristics of e-learning, namely utilizing electronic technology services such as teachers and students can communicate relatively easily without being limited by protocol matters, using independent teaching materials stored on computers so that they can be accessed by teachers and students anytime and anywhere and those concerned need it, utilizing learning schedules, curriculum, learning progress results and matters relating to educational administration can be seen at any time on the computer (Fadrianto, 2019).

E-learning is used as a conducive learning media and can be applied to the current era. Through the e-learning system, students get a lot of convenience in the learning process and teachers also only prepare learning materials in the online system which are then distributed on the e-learning platform. This model can facilitate learning with students and teachers easily accessing teaching materials that are available in e-learning. Especially in the era of society 5.0, people are more likely to prioritize the role of the

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system converted by the role of humans in supporting educational activities, through an integrated system of learning activities, both students and educators are easier to access data and interact with each other (Gunawijaya, 2021).

Before using e-learning in a region, the government must go through a needs analysis and feasibility test. In the early stages, things to consider whether e-learning is needed. If e-learning is needed, then a feasibility test is carried out in the region. The assessment component is to see whether it can be implemented technically, for example, whether it can be installed with an internet network and other supporting facilities such as electricity, cellphones and computers. Then it is also seen whether in the region there are those who can operate available. In terms of economics, is this e-learning activity profitable or is the return on investment greater than one. Seen from a social point of view, the use of e-learning is accepted by the community. E-learning can be said to be successful by being supported by good interactions between educators and students, between students and educational facilities, between students and other students, and active learning patterns in these interactions (Hartanto, 2016).

Instructional design also needs to be considered with aspects such as course content and learning unit analysis (lessons, coverage, relevant topics), learner analysis (students' educational background, age, gender, employment status, and so on), learning context analysis (what learning competition is desired should be discussed in depth in this section), instructional analysis (teaching materials are grouped by importance, arrange tasks from easy to difficult, and so on), state instructional objectives are compiled based on the results of instructional analysis, compile criterion test items based on predetermined instructional objectives, and select instructional strategies based on existing facilities (Fadrianto, 2019).

In Indonesia, Zoom is often used as one of the e-learning applications that support online learning activities. The reason is because the application is easy to use in conducting online learning activities. In addition, this application can also be used as a learning media. Students can show a positive response with the use of Zoom app (Khasanah & Syarifah, 2021). In addition, another platform that is often used and the simplest is Google Classroom which can be used to present learning materials, discussions, assignments, and others related to learning activities. The rapid development of information and communication technology makes educators required to be more creative and innovative in delivering learning materials to their students, because one of the responsibilities of educators is to produce students who have competence, one of which is in mastering digital-based technology so that they are considered capable of facing the increasingly rapid development of the world (Sagita & Nisa, 2019).

Another example of an e-learning platform is Rumah Belajar. The rapid development of technology is related to the main function of learning media, namely as a teaching aid that also influences the climate, conditions, and learning environment generated by educators. The utilization of the Rumah Belajar platform can arouse new

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desires and interests, increase motivation and stimulate learning activities in students (Apriani, 2023).

In realizing a society that can adapt to technology, the government must make many changes in terms of providing technology support facilities, especially in remote areas that are still far from knowledge or introduction to technology. Technology education in Indonesia can be much more rapidly developed, if the government pays more attention to areas with inadequate technology to be able to do online learning. By equalizing technology and education and a society that is aware of the importance of learning technological advances, it is hoped that in the future Indonesian people will be better prepared to accept all existing technological challenges and easily adapt to them starting from early education.

D. Conclusion

The study results indicate that the development of information technology in the era of Society 5.0 can be leveraged in education, particularly as a learning medium through e-learning. This is evident in the increased usage across all age groups and genders, spanning various education levels. On average, individuals learn through mobile devices using Wi-Fi and mobile data internet. In rural areas, the study reveals that electronic devices are primarily used for learning via mobile phones, while in urban areas, mobile phones and computers are utilized. It was observed that the use of computer media in villages still needs to be improved, as indicated by research data. This discrepancy can be attributed to a higher frequency of residence in cities and a predominantly middle-class financial status in urban areas. Furthermore, younger students need help adapting to digital media than their higher-grade counterparts.

The findings of this study have significant implications for the education sector. Schools can gradually adopt digital media for learning activities, while the government can actively contribute by supporting schools in rural or remote areas to ensure equal access to digital learning resources. Efforts should also be made to provide training for teachers who need to be proficient in digital media for teaching purposes. Additionally, schools should start training and educating students on using digital media for learning. The community can contribute by assisting students or schools that need to catch up in adopting digital learning. These measures will ultimately enhance the quality of education in Indonesia, where digital media plays an integral role in everyday life.

Future research in this field can explore various aspects of e-learning activities as school learning media in the era of Society 5.0. This may include examining the success rate of learning activities using digital media, the government's role in improving education quality by meeting the digital media needs in learning, and strategies to enhance education quality through digital media utilization.

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