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Analysis of Changes in Student Activity and Learning Patterns During the Pandemic: Case Study of High School Students in Jember Regency

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ABSTRACT

The Covid-19 pandemic had a significant impact on education. This is indicated by the introduction of an online learning system. Changes in learning system either directly or indirectly will affect student learning activities and patterns. The purpose of this study is to identify differences in student activities and learning patterns during the pandemic. This research uses a mix of comparative and qualitative quantitative methods. Quantitative data collection is done by using an online questionnaire via Google Form, while qualitative data is collected through a questionnaire in the description and literature. This study involved 100 student respondents in high schools in Jember. Data analysis using IBM SPSS Wilcoxon different test. The results of data analysis showed there were differences in activities and learning patterns experienced by students before and during the pandemic. Student activity and learning patterns tend to decrease during the pandemic. The learning process constraints faced by students during this pandemic are connections, assignment methods (assignments tend to be many), delivery methods, and poor time management

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INTRODUCTION

Covid-19 is a plague that was first discovered and infected humans in the Wuhan region, China in early December 2019. Currently Covid-19 has infected 215 countries (Data from the Ministry of Health of the Republic of Indonesia, 2020). As of July 16, 2020, the World Health Organization has recorded 13,338,364 confirmed cases with the number of deaths reaching 579,319 people. This rapid spread makes Covid-19 declared as a global public health emergency and a pandemic status (Valerisha, and Putra, 2020). The Covid-19 pandemic that entered Indonesia in early March 2020 indeed surprised all parties. Not only

the public, the government which was at the forefront in handling the Covid-19 pandemic was also made desperate.

The Covid-19 pandemic that struck Indonesia and other countries had a huge impact. Not only influential in the health sector, but raises new problems in the economic, social, legal, even education. The impact on the economy is that trade tax revenue has declined. The tourism sector which was largely closed caused lodging occupancy to drop by 40% and the microeconomic sector such as MSMEs also experienced a decline (Hanoatubun, 2020). The social sector is also not spared the impact, data from the Minister of Manpower Ida Fauziyah said that around 2,084,593 workers nationwide experienced termination of employment (laid off) and laid off. Of this total, 1,546,208 people work in the formal sector and 538,385 in the informal sector (Haripin, 2020). Termination of Employment (PHK) is certainly an impact on the economy of the community. The absence of work makes poverty rates rise, needs are not fulfilled and triggers criminal actions. Another problem that is no less important is the sustainability of education. Conventional learning systems are very risky causing the Covid-19 pandemic transmission to become faster (Arifa, 2020). Therefore, the Government, especially educational stakeholders, with all their unpreparedness tries to respond to this pandemic with various policies to reduce the rate of spread of the Covid-19 pandemic and ensure the learning process continues. The Ministry of Education, through the Minister of Education and Culture's Circular on Prevention of COVID-19 in the Education Unit, has implemented an online learning system to reduce the intensity of direct interaction between individuals in a school environment that is very vulnerable to trigger the spread of the Covid-19 pandemic. As of mid-March, it has been almost 5 months that the online learning system policy has been implemented. During this time, education stakeholders in a complex setting up to educators in remote villages also continue to adapt in this new system to ensure teaching and learning activities continue. During that time period, technology-based learning alternatives were used to facilitate this relatively new learning system.

Online learning system policies from home at educational institutions clearly cause major disruptions, such as student learning, disruptions in assessment, cancellation of assessment, opportunities to get a job after graduating education, and cancellation of public assessments for qualifications in job selection (Aji, 2020). Learning resources that cannot be accessed by all students due to various obstacles and the effectiveness of students understanding the material need to be considered by education stakeholders. The introduction of an online learning system is certainly not as optimal as conventional learning. Even though the teacher and lecturer give assignments to the students through a Whatsapp group, both through the parent group and each class group. Study time according to the schedule of daily subjects. Learning material is studied independently (Arifa, 2020), but in the end, there are new obstacles that arise. Carlsson, (2015) explained that attending school would increase the memory capacity of students. The closure of schools certainly reduces the intensity of students attending school. Carlsson points out that for 10 days no school will deduct 1 percent of the standard deviation of knowledge. This is a challenge as well as a new problem for stakeholders in education in the process of creating students who are more knowledgeable in a complex era of competition. Loss of time studying at school obviously ends at the loss of students will erode their knowledge. The limited supervision of educators when learning online systems makes the competencies that should be achieved by students difficult to measure. In addition, parental supervision is not optimal for students because their work certainly affects the psychological and motivation of students in learning. Various obstacles and changes in the learning system will certainly have an impact on the pattern of activities

and patterns of student learning. Based on the description above this article takes the formulation of the problem as follows. 1. Did the students' daily activities change during the pandemic? 2. Are there changes in student learning patterns during the pandemic?.

METHODOLOGY

The method used in this study is a mix method (quantitative and qualitative). Comparative quantitative methods are used in this study because they use statistical data in the process of analysis by comparing the state of one or more variables in two or more different samples, or two different times. In addition to use quantitative methods, this study also relies on qualitative methods using literature studies as well as questionnaire question questions to support the results of interpretation or statistical tests that have been produced. According to Creswell (2012) qualitative method is a type of method that explores and understands meaning in a number of individuals or groups of people who originate from social problems. This method is important to be used to interpret symptoms that cannot be read in statistical tests. Quantitative data collection was carried out using an online questionnaire instrument via Google Form on 100 students, while qualitative data was collected through a literature review. Spatial coverage in the study is specific to the area of Jember Regency with research subjects being high school students in Jember district in general. Data analysis using SPSS a non-parametric statistical method wilcoxon signed rank test

RESULT AND DISCUSSION

Changes in activity patterns

Waking hours. The first variable tested in the activity pattern is the hours of awakening before the pandemic and waking up during the pandemic with two answer choices, which are between 04.00-07.00 WIB and above 07.00 WIB. Students who answered at 04.00-07.00 WIB were categorized in number 1 while students who answered above 07.00 WIB were categorized in number 2. This data was ordinal data so the difference test used was the Wilcoxon test. The assumptions used in the Wilcoxon test are H_0 = no significant difference between waking hours before the pandemic and waking hours during the pandemic, H_1 = there is a significant difference between waking hours before the pandemic and waking hours during the pandemic. If the sig (2-tailed) value is less than 0.05 then there is a difference between before and after the pandemic. Conversely, if the value of sig. (2-tailed) is greater than 0.05, so there is no difference between before and during the pandemic. Based on the results of data processing through SPSS using a paired sample non-parametric test using the Wilcoxon test, the following data are obtained.

Table 1. Wilcoxon test output waking up hours before and during the pandemic.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
waking hours before the pandemic	10	1,080	,27266	1,00	2,00
waking hours during the pandemic	10	1,410	,49431	1,00	2,00

Table 2. Test Statistics^a

	waking hours during the pandemic - waking hours before the pandemic
Z	-5154 ^b
Asymp. Sig.	,000

- a. Wilcoxon Signed Rank Test
- b. Based on negative ranks

(Source: author)

Data of descriptive show the average hours of waking during the pandemic are higher than before the pandemic (1.41 > 1.08). A higher average indicates that more students answered their waking hours between above 07.00 WIB (worth 2). The Wilcoxon test states that there was a significant difference between waking hours before the pandemic and during the pandemic with sig. (2-tailed) 0.00 (<0.05). Based on the data above it is also known that there are differences between before and during the pandemic, which before the pandemic, students wake up early and start activities earlier to go to school. Whereas during the pandemic, students tend to wake up late because there is no activity at school. Student sleep patterns change and become irregular. In fact, the need for adequate sleep (not excessive) greatly affects the various functions of the student's body, especially in the case of memory consolidation which will ultimately affect learning achievement, hence, regular and not excessive sleep patterns need to be considered. If sleeping quality is good, then the memory consolidation that occurs during sleep will also be maximal so that it will get better learning achievement (Fenny and Supriatmo, 2016).

The intensity of the use of social media. The second variable included in the activity pattern being tested is the intensity of social media use. In this variable, respondents were given 6 choices of answers, namely 0-1 hours categorized in numbers 1, 1-2 hours

categorized in numbers 2, 2-3 hours categorized in numbers 3, 3-4 hours categorized in numbers 4, 4-5 hours categorized in numbers 5 and 5 hours and above categorized in number 6. The greater the number, the greater the intensity of students' social media use during a pandemic. Tests and assumptions used are the same as before, the Wilcoxon test. Based on the results of data collection, the following analysis results are obtained.

Table. 3. Wilcoxon test output of social media activity before and after the pandemic.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
The use of social media before the pandemic	100	3,3800	1,39827	1,00	6,00
The use of social media during the pandemic	100	4,6900	1,56150	1,00	6,00

Table 4. Test Statistics^a

	The use of social media during the pandemic- The use of social media before the pandemic
Z	-6,989 ^b
Asymp. Sig. (2-tailed)	,000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

(Source: author)

The Wilcoxon Signed Rank test shows the average intensity of social media use during the pandemic is higher than before the pandemic (4.69 > 3.38). These results indicate an increase in the intensity of social media use during the pandemic. Sig value (2-tailed) 0.00 (<0.005) showed a significant difference in the intensity of social media use between before and during the pandemic. The majority of students spend more time playing social media during a pandemic than before. The use of social media is important in supporting the learning process, but there are also negative impacts that need attention. Research by Syamsoedin, Bidjuni, and Wowiling (2015) categorizes the ideal time to play social media is 3-4 hours, the rest is classified as excessive. According to Akram and Kumar (2017) the negative impact of using social media is mainly used excessively divided into 4 namely: 1) Reduced learning and research abilities, 2) Reduced socialization with the surrounding

environment, 3) Disrupting health, and 4) Students become lazy learning . Excessive use of social media can reduce student motivation. This decrease in student motivation results in decreased learning outcomes. This is because most students who have joined social media spend more time to open this networking site than to study. In addition, excessive use of social media can also change lifestyles, even change the way they behave, communicate and socialize with their environment (Wibisono, and Mulyani, 2018).

Learning patterns

The learning pattern affected by two factors that are internal and external. The internal factor include health physical health, psychology, talent, interest, etc (Nursayidah, 2014). While the external factor that affected students’ learning pattern came from parents, community or school. During the pandemic, the schools has stopped conventional learning system and used online learning system as it recommended by The Ministry of Education. A change of learning system has been affected directly and indirectly caused the change of students’ learning pattern as well. Researchers has grouping the indicators that will be tested to find out the change of learning pattern.

Learning intensity. The intensity of learning is one of the supporting factors in improving student learning outcomes. According to Mariyati (2013), the intensity of learning has a positive effect on student achievement. To find out if there were changes in the intensity of learning before and after the pandemic, researchers have collected data with 2 paired samples. Based on these data the analysis results are obtained as follows.

Table. 5. Wilcoxon test output of student learning intensity before and after the pandemic.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Learning intensity before the pandemic	100	3,6600	,76831	1,00	4,00
intensity of learning during the pandemic	100	2,0500	,86894	1,00	4,00

Table 6. Test Statistics^a

Learning intensity during the pandemic - Learning intensity before the pandemic	
Z	-8,250 ^b
Asymp. Sig. (2-tailed)	,000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

(Source: author)

The Wilcoxon Signed Rank Test above shows the average intensity of learning during a pandemic is much lower than before the pandemic ($2.05 < 3.66$). A sig (2-tailed) value of 0.00 (< 0.05) indicates that there is a significant difference between the intensity of learning before and during a pandemic. Decreased intensity of learning experienced by students is caused by changes in learning systems. Please note that the online learning system features self-regulated learning. Self-regulated learning refers to learning that occurs largely from the thoughts, feelings, strategies, and behaviors that are produced by students themselves aimed at achieving goals (Schunk and Zimmerman, 1988). Independent learning patterns are the main focus in online learning systems. In reality, students are still unfamiliar with self-regulated learning patterns because they are accustomed to schools that tend to be teacher center learning. There is no optimal oversight from educators and many think the responsibility of educators in implementing online learning systems is much lighter than with traditional learning (Putra, 2020). In addition, parents who are busy or do not have good academic provision to help learning are also a factor in this decline. The difficulty to consult with educators directly also results in students having difficulty understanding the subject matter. Although various online learning system platforms are available, they cannot replace the quality of direct interaction that occurs in conventional learning. This periodic lack of teacher and parental control is one of the causes of the decrease in student learning intensity during a pandemic.

Learning Media. Learning media is a means of delivering information from educators to students. The use of media in learning aims to facilitate communication during learning (Umamah, 2018). Different learning media certainly require a different understanding process, this understanding process will ultimately also be related to different learning patterns. To find out the changes in learning media used before and during the pandemic, the following is the result of data analysis using the Wilcoxon test.

Table 7. Wilcoxon test output of learning media types before and after the pandemic.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Type of media before the pandemic	100	3,9300	3,17584	1,00	10,00
Type of media during the pandemic	100	2,7200	2,69710	1,00	10,00

Table 8. Test Statistics^a

	Types of media during the pandemic - types of media before the pandemic
Z	-3,614 ^b
Asymp. Sig. (2-	,000

tailed)
a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

(Source: author)

Average types of media during the pandemic were lower than before the pandemic (2.72 <3.93). This shows that the media that could be accessed by students before the pandemic was more varied than during the pandemic. The sig (2-tailed) value of 0.00 (<0.005) indicates that there is a significant difference between media use before the pandemic and during the pandemic. The difficulty for students during a pandemic is access to the learning media in the form of books, which are mostly only available in the school library. Based on that data it can also be concluded that students feel more effective in learning when using book media. Media books are considered to be able to support in independent teaching, besides print learning media especially books have the advantage of being able to present information in a large number, can be taken anywhere and studied at any time, and can be studied according to the talents and interests of the students themselves (Sulistiyani, Jamzuri, and Radhardjo, 2013). Books are also the most familiar media and are commonly used by Indonesian students from an early age so they feel more effective compared to other media. The use of E-Learning media is considered ineffective due to internet quota constraints and internet network facilities which cannot be accessed evenly.

Type of assignments. The types of assignments during a pandemic tend to be communicated through E-Learning media. To find out the changes that occur in terms of student assignments. The following is the result of data analysis using the Wilcoxon test.

Table 9. Wilcoxon test output type of task before and after the pandemic.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
Task before the pandemic	100	3,3000	3,18614	1,00	10,00
Task during the pandemic	100	3,1300	1,93665	1,00	9,00

Table 10. Test Statistics^a

Tasks during the pandemic-tasks before the pandemic	
Z	-,260 ^b
Asymp. Sig. (2-tailed)	,795

- a. Wilcoxon Signed Ranks Test
- b. Based on positive ranks.

(Source: author)

Based on the data above, it is known that the average assignment during a pandemic is lower than before the pandemic ($3.13 < 3.30$). A sig (2-tailed) value of 0.07 (> 0.05) indicates no significant difference between the types of tasks assigned before the pandemic and during the pandemic. Educators still often assign student worksheets even though the online learning system. This shows that a flexible online learning system is not supported by the types of tasks that should be more varied.

Quality of knowledge and learning patterns. The results of data collection regarding the quality of students' knowledge during the pandemic obtained the frequency-descriptive statistical data as follows. As many as 45 students stated that they experienced a decrease in the quality of knowledge, 40 students did not change, and 15 students experienced an increase in the quality of knowledge. Likewise with the quality of student learning. The question posed is "do you feel learning during the pandemic is more effective?". 89 students answered no and 11 students answered yes. Based on this data it can be concluded that there was a decrease in the quality of student knowledge between before and during the pandemic.

Table 11. Test output frequency of knowledge quality during the pandemic.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Decrease	45	45.0	45.0	45.00
	No changes	40	40.0	40.0	85.00
	Increase	15	15.0	15.0	100.0
Total		100	100.0	100.0	

Table 12. Output tests of the frequency of learning quality during the pandemic.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	89	89.0	89.0	89.0
	Yes	11	11.0	11.0	100.0
Total		100	100.0	100.0	

(Source: author)

Learning constraints. Based on the results of data collection about students' conversations in learning during the pandemic, descriptive-frequency statistical data are obtained as follows. A total of 65 students suggested connections when learning brave during the pandemic. 8 students put forward time management challenges during the pandemic, 19 students put forward suggestions given by the teacher during the pandemic learning period, 8 students put forward the method of assignment by the teacher during learning during the pandemic. From the description data that can be calculated the most than what students said in learning during the pandemic is Connection Constraints.

Table 13. Output tests of the frequency of learning constraints during the pandemic.

		Frequen cy	Percen t	Valid Percent	Cumulative Percent
Valid	Connection	65	65,0	65,0	65,0
	time management	8	8,0	8,0	73,0
	assignment method				
	Learning method	19	19,0	19,0	92,0
	Assigment method	8	8,0	8,0	100,0
	Total	100	100,0	100,0	

(Source: author)

During the pandemic the school implemented online learning where the internet connection was an important factor during the learning process. In several studies there were indeed many issues concerning internet connection constraints during online learning. As revealed in the research by (Arifa, 2020) Barriers faced in implementing Online Learning are related to the readiness of human resources, lack of clarity on the direction of local government, lack of proper curriculum, and limited facilities and infrastructure, especially technology and network support Internet. In terms of access, the challenge for the government is when Online Learning is implemented in areas where accessibility, infrastructure and digital literacy are still low. Based on the results of the 2018 APJII National Internet User Penetration survey, the distribution of data shows that more than half of internet users in Indonesia are in the Java region (55.7%), followed by Sumatra (21.6%), Sulawesi-Maluku-Papua (10.9 %), Kalimantan (6.6%), and Bali and Nusa Tenggara 5.2% (free.kompas.id, March 30, 2020). One of the difficulties encountered in the process of learning from home is the limitations of the internet both from the availability of networks and quotas to access online learning. Aji, (2020) also revealed that the use of internet / e-learning media has considerable obstacles, network connections and technical errors such as server down and errors will hinder learning success.

CONCLUSION

Based on the Wilxocon Difference Test statistical data, it is known that the activity patterns consisting of indicators of waking hours and the intensity of social media use experienced significant differences between before and after the pandemic with a Sig (2-tailed) value of 0.00 (<0.05). While learning patterns are measured using several indicators. The first indicator is learning intensity. The Wilxocon Signed Rank Test shows that 87 students experienced a decrease in learning intensity during the pandemic while 13 other students did not experience changes. Based on the 100 data, none of them experienced an increase in learning intensity. A sig (2-tailed) value of 0.00 (<0.05) indicates that there is a significant difference between the intensity of learning before and during a pandemic. The second indicator is learning media. The sig (2-tailed) value of 0.00 (<0.005) indicates that there is a significant difference between media use before the pandemic and during the pandemic. Whereas for the third indicator namely the type of task the value of sig (2-tailed) 0.07 (> 0.05) showed no significant difference between the types of tasks that were given before the pandemic and during the pandemic. Educators still often assign student worksheets even though the online learning system. A total of 65 students stated the connection constraints during online learning during the pandemic. 8 students stated the time

management constraints during the pandemic, 19 students stated the delivery constraints by the teacher when Based on the data frequency of learning constraints, it could be calculated that the most obstacles faced by students in learning during the pandemic were Connection Constraints. Based on the description above it can be concluded that the patterns of activities and learning patterns of students experience changes between before and during a pandemic.

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