Learning practice in mathematics education department of Universitas Muhammadiyah Surabaya during covid-19 pandemic

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Abstract. The purpose of this research is to describe the practice of learning during the covid-19 pandemic in Mathematics Educations Department at Teacher Training and Education Faculty of Universitas Muhammadiyah Surabaya (UM Surabaya). The research used descriptive explorative methods with qualitative approach. The research subjects consisted of students and lecturers in the mathematics education department at Teacher Training and Education Faculty of UM Surabaya. Data collected by documentation, questionnaire, and interview techniques. Triangulation of sources was used to test data validity. Data from students were compared by lecturers' data. The data were analysed through three stages, i.e., reduction, data presentation, and drawing conclusions. The results showed that during the covid-19 pandemic, there are four alternatives learning practices implemented by lecturers. Each alternative consist of 3 stages: delivery, activity, and assessment. The online media used were Zoom, WhatsApp, YouTube, e-mail and Google Meet. The most effective online learning media according to lecturers is Zoom. Meanwhile, according to students, the most effective online media is YouTube. The obstacles faced by students and lecturers are internet network and quota. The learning practices carried out by lecturers during the covid-19 pandemic helped students to keep learning

1. Introduction

The Covid-19 pandemic was announced to enter Indonesia since March 2020. The existence of the pandemic affected all fields, including education. Anticipating the transmission of Covid-19 in schools, the Minister of Education and Culture issued a circular letter dated March 24, 2020. This circular letter regulates the implementation of education in the emergency period of the covid-19 transmission. This circular letter is better known as "learning from home policy" [1]. The implementation of learning from home in primary and secondary education must of course have good cooperation between teachers, parents and students. This is consistent with the result of the study of Dewi that the impact of Covid-19 on the implementation of online learning in elementary schools can be carried out quite well if there is collaboration between teachers, students, and parents in learning at home [2]. The e-learning method leads to improvement in adult students who are studying the mathematical subject in the educational stage of high school, provided that it is compared with the expository method [3].

The implementation of learning policies from home is not only intended for primary and secondary education. The same appeal was also conveyed to Universities. Through Circular letter from tasks executor of Higher Education Director General Number 1 of 2020 concerning the prevention of the Covid-19 spread in higher education, they advised to carry out distance learning in accordance with the conditions of each university. Students are advised to learn from home with online learning using both synchronous and asynchronous through various platforms. For example Google Classroom, Edmodo, or Schoology and others [4]. The existence of an online learning implementation policy certainly raises new problems. For lecturers and students, online learning is one of the new methods and it is not usual to be used in Indonesia. In Polish e-learning brings a new quality to academic education. Many Polish universities have decided to offer lecturers the wide use methods and techniques of distance learning [5].

Students did not regard access to e-learning on campus as a benefit. Male students, students with previous knowledge of computers and students with positive attitudes to new technologies were all less positive to e-learning on campus than other students [6]. Meanwhile, the learner's perception on online learning reveals that it is good in the midst of Covid-19 pandemic. They perceived online learning is very helpful in the middle of pandemic [7].

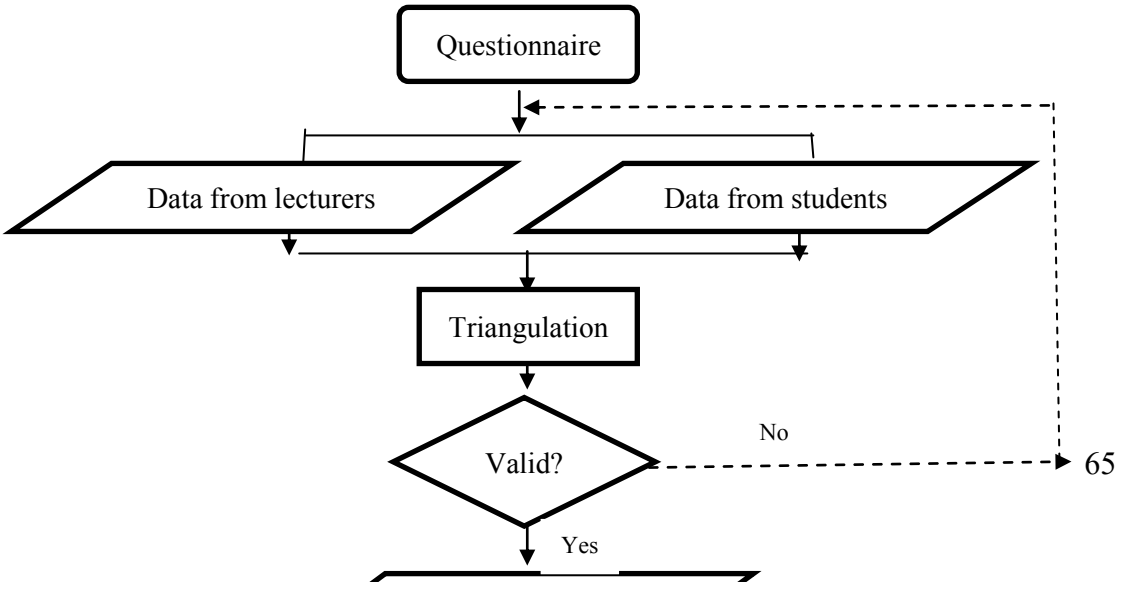
Since 2018/2019 academic year, Universitas Muhammadiyah Surabaya (UM Surabaya), one of muhammadiyah university in Surabaya, has been promoting online learning, but the implementation was only required to be a maximum 30%. Therefore, the implementation can be prepared as well as possible. Meanwhile the implementation of online learning in the Covid-19 pandemic era took place since the 4th week of lecturers and it is likely until the end of the even semester 2019/2020. Thus 75% of learning in the even semester 2019/2020 is done online. This article describes how the learning practices in the Mathematics Educations Department of Teacher Training and Education Faculty in UM Surabaya during the Covid-19 pandemic as well as what obstacles were faced by lecturers and students.

13. Method

In this study, we used a descriptive exploratory method with a qualitative approach. The research was conducted in the Mathematics Educations Department at Teacher Training and Education Faculty of UM Surabaya in the even semester 2019/2020. The research subjects consisted of 10 lecturers and 40 students from semester II, IV and VI.

Data were collected by questionnaire, interview, and documentation techniques. We distributed questionnaire using Google form. The questionnaire was used to obtain data on how the learning practices implemented by mathematics education department lecturers during the Covid-19 pandemic. We gave questionnaire to lecturers and students. The aim is to obtain data from two different sources. We also used interview techniques to obtain additional data to strengthen the results of the questionnaire. Interviews were conducted through WhatsApp media. While documentation technique was used to obtain learning device data used by lecturers and students assignments.

To test the validity of the data, we used source triangulation. We compare data from lecturers with data from students. We spread the questionnaire using Google form. Lecturers and students fill out the questionnaire. We compared whether the data from students is in accordance with the data from the lecturers. If it is appropriate, then the data will be analysed through three stages i.e., the reduction phase, data presentation, and drawing conclusions. If the data from students does not from the lecturer, the questionnaire distribution will be repeated. The triangulation process is illustrated in Figure 1 [8].



14. Result and Discussion

In this section, we describe about online media used by lecturers, alternative learning practices implemented, and what obstacles are experienced by lecturers and students during the practice of learning in mathematics education department at Teacher Training and Education Faculty of UM Surabaya.

All lecturers use Moodle Learning Management System (LMS) i.e., http://genap2019.um-surabaya.ac.id/. The online media used by most lecturers are Zoom, YouTube, WhatsApp, email, and Google Meet. Each lecturer on average uses two online media. The online media used by lecturers are illustrated in Figure 2, where number 1 until 10 in horizontal line represent lectures of mathematics education and number 11 is total use of online media by lectures.

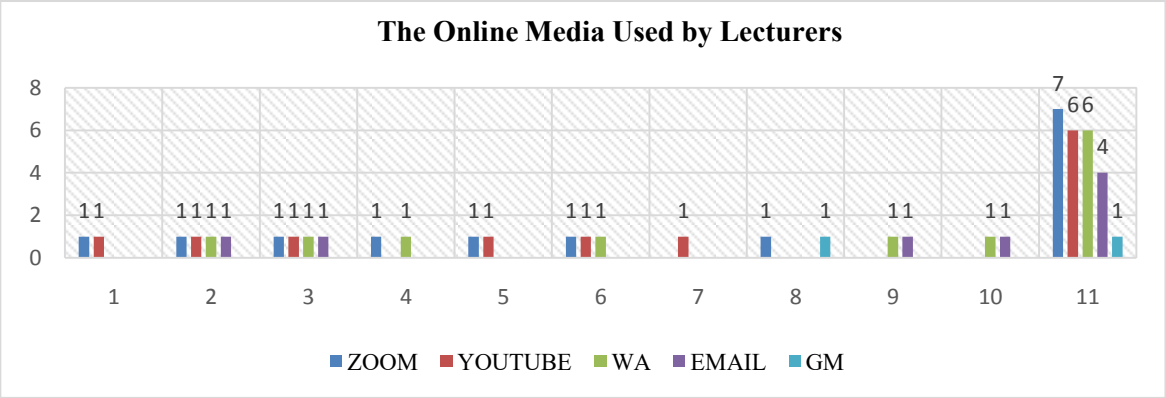


Figure 2. The Online Media Used by Lecturers

The data in Figure 2 show that most lecturers use Zoom media. This media is widely used because it can be like face to face and direct dialogue with students and it is more interactive. Conversations via Zoom can be recorded for viewing at later time. Zoom also provides users free to download applications directly via a laptop [9]. While the second place is YouTube and WhatsApp media. YouTube media is often used because it saves more internet quota. Whereas the WhatsApp media is often used because it is easily accessed by all students. Furthermore, students are familiar with the media. Sofyana and Rozaq (2019) said, that student interest in online learning was around 89% and 78% agreed that online learning with WhatsApp is more effective than conventional learning [10].

Other media used by lecturers are email and Google Meet. Email is often used to send material or assignments. The use of email media is actually already done before the Covid-19 pandemic. While Google Meet functions almost the same as Zoom. The advantage of this media is that application users can be register their accounts to access Hangouts Meet in the Google Advanced Protection Program (APP) [9]. According to 38% of lecturers, the most effective media in online learning is Zoom. By using this media learning becomes more interactive. Second order WhatsApp 31% and third order YouTube 23%. More details are presented in Figure 3.

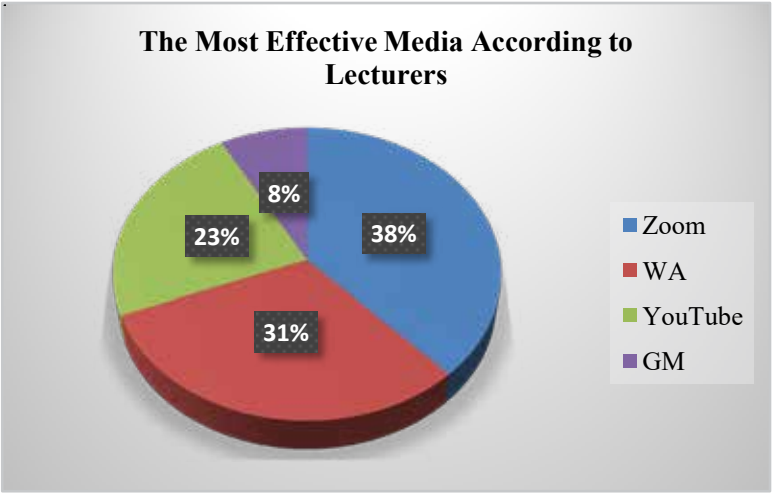


Figure 3. The Most Effective Media According to Lecturers

According to students the most effective media is YouTube (40%), because the material exposure is clearer. They like to learn informally via YouTube videos and Facebook postings with the information and knowledge that extend beyond the boundaries of the textbook and the classroom [11]. The second order is 38% WhatsApp and the third order Zoom 20%. Briefly presented in Figure 4.

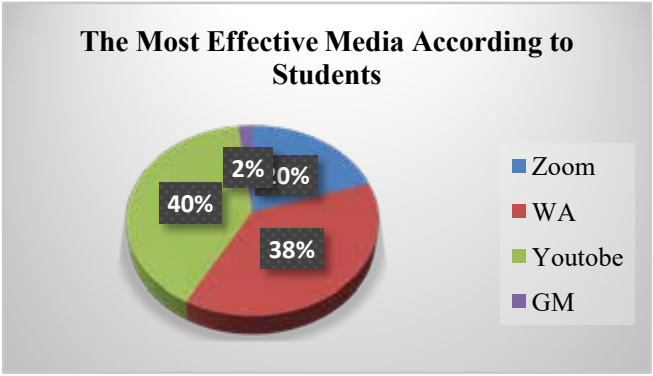


Figure 4. The Most Effective Media According to Students

The online media used have an effect on the learning practices of the lecturers. Learning practices is divided into three stages i.e., delivery, activity, and assessment. There are four alternative learning practices conducted by lecturers. Briefly summarized in Table 1.

Table 1. The Alternative of Learning Practice in Mathematics Education Department of UMSurabaya

Alternative	Delivery	Activity	Assessment
1	Upload material on YouTube	Discussion through WhatsApp media	Attention to the accuracy of the answers, responses, or questions of students
2	Share screen material on Zoom	Question and answer through zoom	Give an assignment
3	Upload material and	Students ask	Give an assignment.

	question on LMS	questions at LMS. Lecturer answers are delivered via video tutorials at YouTube	Students send assignment through LMS or WhatsApp or email.
4	Upload material and assignment on LMS	Discussion through WhatsApp media	Give an assignment. Students send assignment through LMS or WhatsApp or email

Alternative 1. Lecturers upload material through YouTube. Students study and pay attention to the uploaded video tutorial. Furthermore, discussing about the material through WhatsApp media. During discussion the lecturer conducts an assessment by observing the course of the discussion and paying attention to students' answer or responses or questions during the discussion. Assessment on alternative 1 emphasizes more on performance appraisal.
Alternative 2. Lecturers conduct learning such as face to face through video conference. Material is conveyed through the screen share on the Zoom media. Next is the discussion and question and answer session. During the discussion, the lecturer also assessed performance by paying attention to student activities. At the end of learning, students are given an assignment. Assignments sent via e-mail or e-learning page (LMS).
Alternative 3. Learning begins by providing material and questions on LMS to stimulate students to read and search for answers. After that, they do question and answer. Students ask questions at LMS, and then lecturer answers are delivered via tutorials video on YouTube. As an evaluation, students are given assignments.
Alternative 4. Learning begins with providing material and practice questions on LMS. Furthermore, conducting discussions and questions-answers through WhatsApp media. As an evaluation, students are given assignment.

According to students, the alternative online learning practices implemented by lecturers during the Covid-19 pandemic helped students to continue learning, although there were still many obstacles and shortcomings. Allo (2020) said that they perceived online learning is very helpful in the middle of pandemic [7]. Meanwhile, according to several lecturers, during online learning there were some students whose communication skills improved. The tasks collected are also more varied.

The use of various online media in learning certainly has the same goal, that is learning becomes effective in achieving learning objectives. Therefore, the use of online media always pays attention to the condition of students, lecturers, and the neighborhood.

The practice of learning during the Covid-19 pandemic era was inseparable from various obstacles. The main obstacle faced by both lecturers and students is the internet network. Another obstacle experienced by the lecturers is the application of equations. In addition to internet network and quota problems, students often have difficulty managing time because all lecturers give assignments simultaneously with other lecturers. So they are often late to upload assignments. Figure 5 and 6 are examples of student assignment taken from lecturer documents.

Figure 5. Example Task Computer Applications with 3D Cabri Software

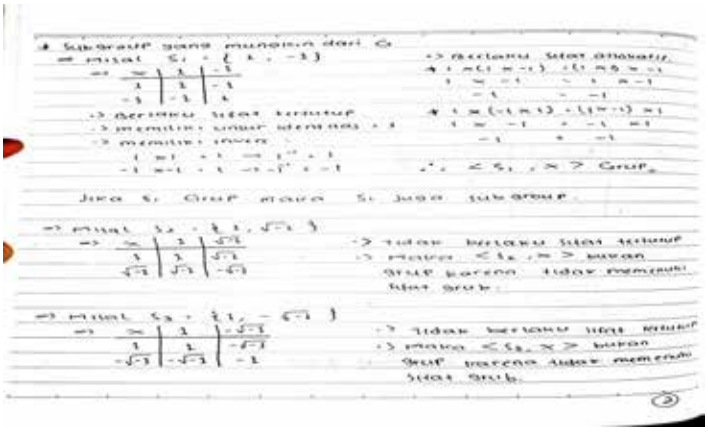


Figure 6. Example Group Theory Task

15. Conclusions

Based on the results of the data analysis, it can be concluded that there are four alternative learning practices implemented by lecturers in the Mathematics Education Department at Teacher Training and Education Faculty of UM Surabaya during the Covid-19 pandemic period. The four alternatives consist of 3 stages. They are delivery, activity, and assessment. The online media used are Zoom, WhatsApp, YouTube, e-mail and Google Meet. The most effective online learning media according to lecturers is Zoom, because learning becomes more interactive by using this media, lecturers and students can see each other. Meanwhile, according to students, the most effective online media is YouTube, because the exposure of the material is clearer so it easy to understand. The obstacles faced by students and lecturers are internet network and quota. The learning practices carried out by lecturers during the Covid-19 pandemic helped students to keep learning

16. Acknowledgment

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17. References

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