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Utilizing the Role of Feedback on Mathematics Online Classes in the New Normal Era

Memanfaatkan Peran Umpan Balik pada Kelas *Online* Matematika di Era Kenormalan Baru

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Abstrak

Di era kenormalan baru dimana pelajar, pengajar dan bahkan orang tua dipaksa untuk membiasakan diri dengan pembelajaran jarak jauh, kita tidak bisa begitu saja mengabaikan pentingnya pemberian umpan balik atas pekerjaan pelajar terutama dalam pembelajaran matematika, karena umpan balik akan memberikan informasi mengenai tingkat pemahaman pelajar tentang materi yang diberikan dan juga menyemangati pelajar karena pekerjaan mereka dihargai. Artikel ini merupakan artikel deskriptif kualitatif mengenai gambaran pembelajaran matematika *online* serta bagaimana cara memanfaatkan peran umpan balik di dalamnya. Data dalam artikel ini diperkaya dengan hasil kuesioner yang diberikan kepada 83 responden yaitu pelajar di sekolah tinggi di Kalimantan Barat. Hasil kuesioner mengungkapkan bahwa 64,5% responden berpendapat bahwa grup diskusi *online* merupakan *platform* ternyaman untuk digunakan dalam pembelajaran *online*, sedangkan video konferensi (90,3%) merupakan *platform* paling tidak nyaman untuk digunakan dalam pembelajaran *online*. Mengenai umpan balik, 53,8% responden memilih informasi korektif akan pekerjaan pelajar adalah bentuk umpan balik yang lebih diharapkan dibanding dua bentuk lainnya. Di bagian akhir artikel ini juga dipaparkan mengenai beberapa cara yang disarankan bagi pengajar untuk memberikan umpan balik berdasarkan *platform* pembelajaran jarak jauh yang digunakan di era kenormalan baru.

Kata kunci: umpan balik, kelas online, era kenormalan baru

Abstract

In this era of the new normal where students, teachers, and even parents are forced to get accustomed to distance learning, we cannot simply overlook the importance of feedback on students' work especially in mathematics teaching and learning, since feedback will provide information about the level of students' understanding of the material provided and also encourage them because their work is valued. This is a descriptive qualitative article about the overview of online mathematics classes and also how to utilize the role of feedback in them. The data in this article was enriched with the results of a questionnaire for 83 respondents it is students from higher education in West Borneo. The results of the questionnaire revealed that 64.5% of respondents thought that online group discussions were the most convenient platform to use in online learning, while video conference (90,3%) recorded the least. Regarding feedback, 53.8% of respondents chose corrective information on the work of the learner as the preferred form of feedback compared to the other two. This article also suggested some ways for teachers to provide feedback based on the distance learning platform used in the new normal era.

Keywords: feedback, online class, new normal era

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INTRODUCTION

In late December 2019, a novel Coronavirus 2019-nCoV was initially spread locally in Wuhan, eventually becoming a global pandemic known as 'Covid-19' after similar cases reported in various countries (Zhu et al., 2020)(Widyasmoro, 2020a). In Indonesia, the first confirmed case was announced on March 2, 2020 (Widyasmoro, 2020b), and until this paper is written, there are millions of positive cases reported in the country (Satuan Tugas Penanganan Covid-19, 2022). This situation prompted Indonesian government to issue an appeal of 'Work from Home' (WFH) as of March 15 (Cahya, 2020). This appeal affects many sectors, one of them is education, where teachers were obliged to conduct the class remotely-using online teaching.

The sudden implementation of online teaching (also known as distance learning) clearly causing many difficulties faced by not only teacher and students, but also for parents, such as low technology literacy, uneven digital infrastructure in Indonesia, and social inequality (Angdhiri, 2020). This condition even extended since the Indonesian Kementerian Pendidikan dan Kebudayaan (Ministry of Education and Culture) also stated 'The New Normal' era for students in schools starting from July 2020 where distance learning is still applied in some areas affected by Covid-19 (Pinandita, 2020). The interaction between teacher and students in distance learning is limited, and this makes the situation worse as we discuss about mathematics teaching.

In mathematics classes, we generally find teachers guide students closely to understand material and to give feedback to assess students' understanding. Forms of feedbacks such as information about the score of students' performance and/or test, information about the truth of students' assignments, and corrective information about each item of students' work, are given to allow students to build their understanding of given material individually (Paneo, 2007). Feedback act as a stimulus where students respond by examining and correcting their assignment based on each individual's ability, hence enhancing students' ability to think to learn (Kennedy et al., 2008). However, in this era of The New Normal where classes are being conducted mostly online where interaction between students and teachers is limited, there are only limited ways of feedback given on students' work, hence only a small amount of feedback is being given by teachers. This should not be the case; feedback in mathematics teaching is important since it will give students information about their understanding on particular material and how to improve their performance (Santos & Pinto, 2009).

Feedback is important to help students reach their Zone of Proximal Development (ZPD) according to Vygotsky's theory (Kennedy et al., 2008),

hence it is important to give feedback even in this era of The New Normal where distance learning is being conducted. Based on our interview with random students in various levels of education during the implementation of distance learning, this far the feedback given by their teachers are minimum to nothing, hence making it difficult for students in grasping the material studied.In this paper, we will discuss how to utilize the role of feedback on mathematics assignments in online classes during The New Normal era and how this impacts students' performance in the given assignments.

METHOD

This descriptive qualitative research aims to explain how to utilize the role of feedback on online mathematics classes, especially in The New Normal Era. This research was conducted by giving a questionnaire to 83 respondents of higher education students in Pontianak, Indonesia whose origin spread throughout West Borneo province. Respondents are chosen by purposive sampling to enrich the discussion about platforms used and students'-preferred feedback type. All of our respondents were studying Statistics as the only mathematics-related subject in their running semester.

Data collected by questionnaire contains items that aimed to investigate various aspects of online classes and feedback according to respondents' experience, such as the most difficult subject to follow, the most convenient and inconvenient platforms, and preferred feedback received during the implementation of distance learning. The result of the questionnaire will be described and enriched by an explanation of how to utilize the role of feedback on mathematics online classes based on different categories of learning platform used.

FINDINGS AND DISCUSSION

This section focuses on presenting findings and discussion related to various aspects of online classes and feedback according to respondents' experience, such as the most difficult subject to follow, the most convenient platform, the most inconvenient platform, preferred feedback received during the implementation of distance learning, and primarily how to utilize the role of feedback in mathematics online classes in the new normal era.

Based on the result of the questionnaire answered by our 83 respondents related to distance learning, 50% of the students choose Statistics the only mathematics related subject in the running semester as the most difficult subject to follow during the implementation of distance learning. When asked about the most convenient platform in online classes, 90,3% of our respondents as showed on Table 1 stated that video conference platform are *the most inconvenient* to use, meanwhile 64,5% choose online chatting

groups and followed by 29% respondents choose learning management system (such as Google Classroom) as *the most convenient* platform to use. The reason varies, from their unsupporting gadgets, low-income families, limitation of internet connection, and even the lack of electricity in students' domain area. These different platforms offer different ways to deliver feedback, which will be discussed later in the paper.

Table 1. Top 2 Most Convenient and Most Inconvenient Platforms to Use in Online Classes

Top 2 most convenient platforms to use in online classes		Top 2 most inconvenient platforms to use in online classes	
Platform	Percentage	Platform	Percentage
Online chatting groups (WhatsApp Groups, Telegram Groups)	64,5%	Video conference (Zoom, Google Meets)	90,3%
Learning Management System (Google Classroom, Edmodo)	29%	Youtube Live Streaming	6,5%

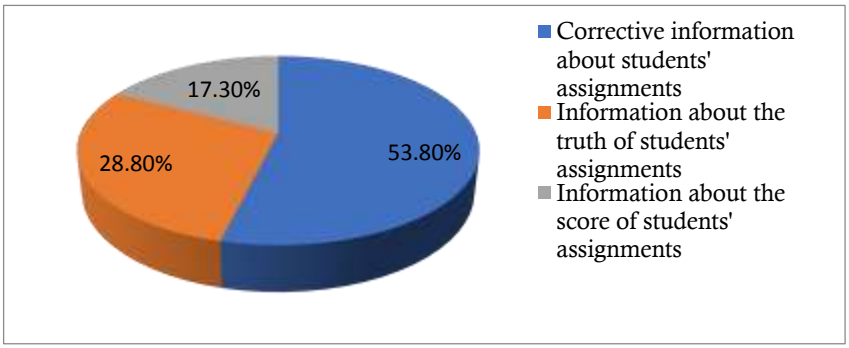

Figure 1. Preferred Feedback Form According to Subjects

Related to feedback given in online classes, we found that 53,8% of our respondents stated that they are 'strongly agree' that they prefer to get feedback on their work, 30,8% stated 'agree', and only 5,8% and 9,6% respectively stated 'disagree' and 'strongly disagree'. This shows that even in the implementation of distance learning, students are longing for teachers' attention in the form of feedback on students' work. Students feel that their work is valued when teachers give special attention by providing personal feedback. We also found that 53,8% of our respondents prefer corrective information on their work rather than only information about the truth of the work or simply the score.

Feedback in Mathematics Instruction

Vygotsky's theory of social constructivism stated that the *Zone of Proximal Development* (ZPD) is just beyond the learner's current capabilities but can be reached with assistance from adults or peers. The form of such

assistance may vary; one of them is *providing feedback* while students process experiences (Kennedy et al., 2008). Feedback is corrective information given to show the gap between the expected result and the carried out task, aiming mainly to the improvement of the quality of the task, which can be given in groups or individually. In mathematics instruction, providing feedback is important since it will give information to students of their understanding on the given material. Form of feedback might be symbols or statements (affirmatives, interrogatives, and mixed), the length might either be long or short. Whichever form and length, the aim of giving feedback is to reinforce students' performance since they will get information on what part of their performance needs to be improved, as long as the given feedback is authentic and meaningful (Santos & Pinto, 2009)(Kennedy et al., 2008)(Paneo, 2007)(Ristiana, 2018).

Paneo (Paneo, 2007) specifies that feedback is given to students individually in order to: (1) give information about the score of students' performance and/or test, (2) give information about the truth of students' assignments, and (3) give corrective information about each item of students' assignments. Feedback is given to allow students to build their understanding of given material individually. Feedback act as a stimulus where students respond by examining and correcting their assignment based on each individual's ability, hence enhancing students' thinking ability to learn (Kennedy et al., 2008). Providing feedback especially in mathematics instruction allegedly improves students' understanding by many research (see: Paneo, 2007, Santos & Pinto, 2009).

Online Class in Mathematics Instruction

Online classes are classes that are conducted utilizing technology and internet. In the era of Industry 4.0 which emphasizes on the use of technology and internet, there is an increasing number of online education in higher education back in early 2010s (Baran, 2012), but this does not apply yet to elementary and secondary schools. Most teachers conducting classes in traditional design technology and internet are not integrated effectively, even when the students already are using internet and technology on daily basis (Rachim, 2019). Even so, online education at all levels has experienced explosive growth over the beginning of 2020 due to the Covid-19 outbreaks since students and teachers are forced to conduct the teaching and learning process remotely. Teachers find it challenging to arrange the time and effort in order to adapt the traditional education environment into online education environment (Baran, 2012), and both teachers and students may not skillfully operate computers and utilize the internet, yet the condition related to the Covid-19 pandemic force them to use both computers and internet on daily basis.

Several benefits of online classes are the classes are relatively flexible and convenient allowing students who are physically impossible to attend classes to be able to study, also minimizing costs such as transportation cost. On the contrary side, there are also several drawbacks such as lack of direct (face-to-face) social interaction, limited access to resources, technical difficulties, and also low satisfaction from both teachers and students (Bolliger & Halupa, 2012).

There are many platforms of online classes; Zoom, Google Meets, Moodle, Schoology, Google Classroom, Edmodo, or even using the combination of WhatsApp Group and e-mail. Online classes conducted by video conference platforms such as zoom and Google Meets might be tricky especially for students and teachers with limited internet access and low-specification device which is most of the case in Indonesia. Meanwhile, in online classes conducted using platforms such as Google Classroom, Edmodo, and Schoology, teaching and learning might be felt rigid and only be conducted one way since both teacher and students cannot see each other expressions, gestures, and body language. Meanwhile, online classes conducted by a combination of WhatsApp Group and e-mail usually are more practical, with a note on the availability of device memory storage, especially for students and teachers from the low economy background that cannot afford computers, laptops or androids with sufficient device memory.

Particularly in mathematics classes, teacher face difficulties in teaching mathematics online because they cannot freely write mathematical symbols and numbers while explaining the material such as in traditional classes. Teachers also have a hard time observing students' expression to get quick feedback on whether the students understand the material. In online classes, mathematics teacher spends more time and energy in preparing the material compared to traditional classes. Thus from our observation, there is no online learning platform that can be a perfect help for mathematics teachers.

Utilizing the Role of Feedback in Online Mathematics Classes

Feedback is important in mathematics classes since it will give students the information of their understanding of given material. Usually in traditional mathematics classes teachers are giving scores, marks, symbols or comments on students' mathematics assignments (Santos & Pinto, 2009), but in online mathematics classes, providing such feedback might be difficult. The simplest way to give feedback is when the teacher gives scores to students' assignment, but feedback in the form of information about the truth of assignment and corrective information of students' assignments is also important in improving students' understanding. The latter two might be challenging there are difficulties such as insufficient device memory to download all students' assignments, poor internet connection allowing a

teacher to download students' assignments and also re-uploading them after giving feedback, and difficulties in writing mathematics symbols in students' assignments using devices such as computers and androids. Unfortunately, there is still not much research and discussion regarding feedback in online mathematics class.

Taking the researcher's online class of Statistics as an example, the researcher tries to give many feedbacks possible, especially in the form of corrective information about students' performance, since the form is constructive and more preferred by the students. Usually, feedbacks are given after students perform a certain action, such as giving answers and solving problems, by giving encouraging yet constructive remarks such as "you did really well in solving the problem but you may reconsider the 5^{th} line of your work. I think a step is missing and this affects the later steps", or "your presentation on how you solve the problem is outstanding, but if I may give constructive advice, you can try to speak a little bit slower so it will be easier for your friends to follow your train of thought". This feedbacks may not be easily communicated in the distance learning setting, but these can be provided in various way according to the platform used in online learning, which will be discussed later in this paper.

After analyzing the result of or questionnaire, we see that even higher education students find it difficult to follow the mathematics-related subject in the implementation of distance learning. This becomes our concern, since for higher education students statistics is a compulsory course that will benefit them in finishing the final paper in the future. In general, mathematics at all levels is a compulsory subject, and will benefit students to practice their ability of reasoning. But the fact that students higher education students, even are feeling inconvenient using video conferencing platforms that enable teachers to teach synchronously and give direct feedbacks become a big hurdle to jump over. Nevertheless, as a mathematics teacher, we cannot simply ignore the importance of feedback on students' work hence we have to find a way of effectively giving students feedbacks even in this time of The New Normal where conducting online classes is the main method possible.

As a base of our discussion, we stated here that there are three big categories of learning platforms used in distance learning: (1) video conference platforms (such as Zoom, Google Meets), (2) Learning Management Systems (such as Google Classroom, Edmodo), and (3) online chatting groups (such as WhatsApp and Telegram groups), and there are three forms of feedback that can be given to students' assignment suggested by Paneo (Paneo, 2007): (1) score of assignment, (2) information about the truth of assignment, and (3) corrective information of students' assignment.

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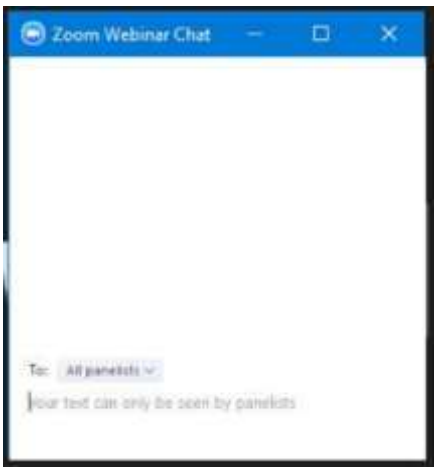

Figure 2. Chat Box In Video Conference Platform

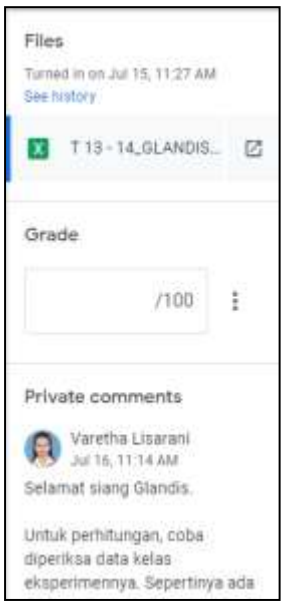

Figure 3. Private Comments In LMS

Taking Zoom as an example of video conference platforms, we can provide feedback directly by speaking on the live video or by typing on the chat box in the platform when students ask questions related to the materials given or related to their work. We can directly and immediately give information on students' scores, feedback of the truth of their work, and also give corrective information if their work needs improvement. However when a teacher gives feedback on a video conference platform, the feedback is not personal. This will become a problem if the student is an introvert type that feels uncomfortable being 'corrected' in public, in the other hand it is beneficial since all students may learn together from the feedback we give to one student. We can give feedback through personal chat, though, but this feedback is limited to written expression only and we may face difficulties when we need to give feedback containing mathematics symbols that are not covered in the characters allowed in the chat box. The other drawback is that video conference platforms need an amount of stable internet connection, which is not the case for most of our students. When the connection is unstable, students may miss some parts of our feedback, hence resulting in miscommunication and/or misinformation.

Taking Google Classroom as an example of Learning Management System (LMS), we can provide feedback of the truth on students' assignment and also the corrective information both classically using the 'stream' or personally by giving private comments under students' submitted assignment. The advantage of using LMS is that most LMS provided a system of grading.

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We can give scores and grades to students and we can choose whether to publish them or not. The grade we give for each student's assignment is also automatically recapped and summarized into a file if we choose to. The drawback of giving feedback in LMS is similar to those of in chat box of video conference: written expression is limited to characters allowed in the comment box. Moreover, since the teaching and learning process in LMS mostly are more flexible, then most of the time teachers cannot catch up fast enough to give students immediate feedback. Teachers are also limited to giving written feedback only; teachers and students cannot see each other body language and expression when giving and receiving feedback that leads to miscommunication and misinterpretation.

Figure 4. Discussion In Online Chatting Groups

Taking WhatsApp groups (WAG) as an example of online group chatting, we can provide both classical feedbacks using the group chatting and also personal feedback by using personal chat. The advantage of using online group chatting is that students can use the platform easily and most of them do not need to download additional application software or access an additional website. They can simply use online chatting application that they already familiarly use on daily basis. By WAG, teachers also can give feedback not only in written form (typing or sending pictures of our handwriting), but also an explanation in form of voice notes and even short videos. In mathematics online classes, the teacher can freely share personal feedback by recording such as step-by-step corrective information or even solving process without any limitation of characters or mathematics symbols.

Online group chatting is relatively simple to use even by older generation teachers and has many features that might help in the process of online teaching such as attaching various kinds of files. The drawback of using online chatting groups in giving feedback is that downloading pictures, voice notes, and videos may take up the memory space of the device. Since most of our students are coming from low income families, they cannot afford high-end gadgets; most of them are stuck with small memory space gadgets. This is also a problem for teachers since they have to receive messages from students and also send corresponding feedback in various forms.

We also have to take notes in our questionnaire that students express that they prefer to get feedback of their work. Students will feel that their work is valued when teachers give special attention by providing personal feedback.

Rather than only information about the truth of the work or simply the score, students also prefer feedback in the form of corrective information of their works.

CONCLUSION AND SUGGESTIONS

In this era of The New Normal where students, teachers, and even parents are 'forced' to get accustomed to distance learning, we cannot simply overlook the importance of feedback on students' work, especially in mathematics teaching and learning. Although given remotely, feedback will give information of students' understanding of the given material and also encourage them that their works are valued. This is important since we as teacher cannot interact physically with our students and they may feel that they are fighting alone without any support in this pandemic situation since they feel the distance from their peers and teachers.

There are three purposes feedback are given to students: (1) giving information about the score of students' performance and/or test, (2) giving information about the truth of students' assignments, and (3) giving corrective information about each item of students' assignments. Since feedback acts as stimulus where students respond by examine and correct their assignment based on each individual's ability, it enhances students' ability to think to learn. By the result of our study, students prefer feedback with the purpose of giving corrective information about each item of students' assignments.

We may reckon that providing feedback in distance learning is challenging, but it is not impossible. We suggest giving various kinds of feedback in mathematics online classes, based on the platform used. When using video conference platforms, we can give direct feedback to students synchronously when we see their body language and expression or when they ask for our guidance in solving problems. If we use learning management systems, we can give personal feedback on students' assignments by leaving private comments under students' submitted work. If we use online group chatting, we can send various files such as pictures, voice notes, even short videos to give feedback on students' work.

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