

# Teachers' Practices of Online Formative Assessment in Physics during the Covid-19 Pandemic

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**Abstract:-** The Covid-19 pandemic greatly affected the educational system. This sudden shift from traditional to distance learning also changed the way teachers give assessments to their students. In this paper, we will discuss and focus on analyzing teachers' practices of online formative assessment in Physics during the Covid-19 Pandemic in selected high schools. Participants were 7 teachers from a selected private high school. A qualitative content analysis of the answers to a semi-structured interview was carried out to understand the practices associated with assessment given by Physics teachers. The analysis of the findings shows that teachers use different online platforms to actively engage their students in a variety of formative assessment practices. According to the interviews conducted with the Physics teachers, they have different practices used in providing formative assessment in their online classes, although we can see in the findings that teachers are facing the same challenges when it comes to the results of their assessment. In addition, since the study only included a few teachers from a private high school, the conclusions cannot be applied to all high school Physics teachers. However, the researchers suggest that a large-scale survey or interview be done to a wide scale of institutions to gain more and new insights into many areas of online assessments.

**Keywords:-** Formative assessment, teachers' practices, covid-19, physics teacher, pandemic

## I. INTRODUCTION

Many teachers during the Covid-19 era shifted their teaching methods from traditional to distance learning. In both traditional and distance education settings, assessment is an important aspect of the teaching-learning process. The use of Information and Communications Technology (ICT) in the delivery of learning increases exponentially, especially during this time of pandemic. However, these changes in learning activities did not stop teachers from evaluating students' achievements. The test results can be utilized to help students better grasp the materials and to assist teachers in preparing instruction (Yulianto, 2021).

Shifting assessment from a traditional classroom setting to a digital environment is difficult because the common approach or often temptation that teachers do is to mirror face-to-face strategies and practices (Meccawy,

2021). In addition, due to lengthy quarantine and social distance times, even assignments are distributed to pupils via the internet. Online learning has become a key component of the twenty-first century because we start to utilize the use of different internet platforms in this time of pandemic.

COVID-19 enforced a move to online learning, however several universities in developing nations lack the necessary resources to effectively educate online (Almahasees, 2021). The most prominent concerns are technological issues, followed by teachers' lack of technical abilities and badly suited instructional styles to the online setting (Coman, 2020). Teachers are not used to teaching students in an online set-up and internet connectivity is another obstacle that underprivileged students might be experiencing. Moreover, because of their lack of guidance on how to implement diagnostic, formative, and summative assessments online, almost all participants chose not to use online quizzes and exams to assess validity, reliability, and other practical elements. Instead, they used projects, oral presentations, reflection papers, and performances as assessment tools (Mirza, 2021).

Formative assessment is continual feedback that allows a teacher to assess effectiveness and a student to progress in their learning (William, 2015). In fact, all assessment is formative if we define assessment as the process of determining where learners are at. According to Hattie (2003), formative assessment gives teachers and students feedback to help them address three crucial questions: What is to be learned? How is learning progressing? What will be learned next? Incorporating formative assessment in teaching and learning style will improve student learning outcome. When used efficiently in an online environment, feedback from formative assessment has been shown to increase learning (Diltz & Moe., 2014; Pachler et al., 2010).

Students' academic progress can be assessed in a variety of ways using online learning platforms (Ogange, 2018). To allow such informal educational exchanges, online learning platforms provide a combination of asynchronous and synchronous resources. McCarthy (2017), found that formative assessment promotes student engagement and peer feedback when students are entrusted with assessing the work of other students. Effective online formative assessment can assist online courses become more

learner-centered and increase student engagement in the course, resulting in more meaningful learning experiences. Online quizzes, on the other hand, can be used at the start of a lesson to make a diagnosis of the students' prior knowledge of a specific topic and then during the lesson teachers can check the performance of learners' on your subject content with the use of formative assessment (Mirza, 2021). However, for teachers, creating online quizzes and tests for each subject takes time and requires a lot of innovation. Teachers will be able to more efficiently analyze various types of tasks and immediately identify students who want academic assistance. During formative assessment, teachers can present students with a variety of feedback options, including written, audio-recorded, or video-recorded comments (Mirza, 2021). One of the most important approaches to acquire the desired learning and discipline which will enable online learning to be authentic and meaningful is to employ formative assessment effectively (Ogange, 2018).

Various firms were obliged to change their workflow tactics and implement new technology as a result of the pandemic. In most cases, there are institutions who do not have enough time to consider how new strategies and technology should be adopted and incorporated into their current situations (Carroll & Conboy, 2020). As a result, educators must employ efficient teaching tactics that take advantage of technological advancements in order to improve student interest in distance learning (Bailey, 2015). It is now the instructor's obligation to re-design activities or assessments that adhere to the framework's criteria and effectively engage and encourage students to achieve the targeted learning outcomes. Teaching and studying online provides a lot of benefits, but it also has some drawbacks (Almahasees, 2021). Due to the temporal flexibility in attending classes, it facilitates the learning process for students. Online learning, on the other hand, not only serves as a barrier to students' participation in real-world classroom activities but also to the teachers who need to provide assessments in the new normal. This study aims to find out the Teachers' Practices of Online Formative Assessment in Physics during the Covid-19 Pandemic.

## II. METHODOLOGY

### A. Research Design

This is qualitative research to analyze teachers' practices on online formative assessment in Physics during the Covid-19 pandemic. The research will use semi-structured interviews to gather information on the practices on online formative assessments in physics. The study will utilize a nonprobability sampling method in selected Private High Schools in Luzon. The respondents will participate in answering semi-structured interviews through video conferencing about their practices on online physics teaching particularly on online formative assessments in the subject matter.

### B. Research Participants

The participants in this study are teaching in Private High Schools in Luzon. First requirement was that the participant is a High School Physics Teacher. In addition, the participant should be currently teaching on an online platform. Seven faculty members were selected randomly from this population, this is considered important in order to provide useful feedback on teacher practices of online assessment in Physics.

### C. Research Instrument

A semi-structured interview was prepared and asked to seven high school physics teachers. It was intended to find out the physics teachers' practices used on formative assessments during pandemic. The duration of the interview differed depending on their answers and follow up questions. Each interview session with the participants lasted about half an hour. On the whole, 7 interviews were conducted with a total of 210 minutes. The interviews were transcribed for further analysis after being conducted and recorded by the researchers.

## III. RESULTS AND DISCUSSION

All teachers interviewed made an effort to engage formative assessment in their classes during the pandemic. However, they varied in terms of practices used, performing the online formative assessment and challenges encountered while providing online formative assessment.

### A. Teachers' Practices of Online Formative Assessment.

The data from teacher interviews showed that there are teachers giving multiple choices, true or false and identification as their type of formative assessment. However, they are not limited to using those types of assessments, they also use problem solving as their assessment especially in Physics. One teacher says,

"I usually used pen and paper type of quizzes, either identification, multiple choice, true or false and so on... it is not limited to one and I also do problem solving"

Another teacher says,

"When it comes to physics, language is more on math, so in formative assessment you need to analyze problems so we use problem solving as our formative assessment."

There are teachers also who prefer to use open ended questions for their conceptual problems. Teachers prefer the use of higher order thinking skills in their formative assessment.

"Open-ended questions and problem solving, I don't make use of multiple choices, true or false, because for me it is in the lower order thinking skills. I am really into Conceptual examples."

"For conceptual examples in physics, I used open ended questions and I let the students think and question the universe."

Teachers use different online platforms to better integrate formative assessment in their respective classes. Some teachers have their own platforms provided by the school and the others use what is readily available.

“I use Kite academy or v smart in which the scores will automatically be reflected, Kahoot sometimes Gform and also messenger.”

“For the platforms/ applications I do use slido, mentimeter, google slides, and jamboard that's all.”

One of the respondents gives emphasis on the use of novel applications and unique tools in giving assessment in his/her class. Another teacher says,

“The online platforms I usually use in giving formative assessments are the following: Genyo e-learning – it is the school’s main platform for the submission of tasks and for assessment purposes. This platform can be used during the session as well in which the teacher can create a quiz with a time limit. Quizizz – it is an online site where students can enjoy playing while doing the assessment because it is in the form of a game. Teachers can easily see which particular concept the students do not fully understand yet. Teachers can also use this when recalling topics from the previous session. Google form – it is the platform I use when I want the student to answer the quiz in their convenient time. Mainly for review before the summative test.”

The teachers have a common set of practices when it comes to giving online formative assessments, some of which are opening of cameras, giving time limit while answering, and asking questions and sharing thoughts on the answers after having the formative assessment.

“Since I can’t fully guarantee the honesty of each student when taking the test, I always asked them to have their Camera On and give a quiz with a time limit. If the student can’t turn on his camera, he can’t take the quiz. The student may take the quiz on a scheduled date while meeting with me in the google meet.”

Some teachers doesn’t stop on just getting the scores of their formative assessments, they still wanted to let their students discuss their answers in the class to correct them or the other students in the class:

“During online class, every after discussion, we have an evaluation in which we give 5-10 items of multiple choice or identification. And then, it could also be seatworks done during online class and then we give them time to answer like 3-5 minutes then afterwards somebody will share their work or the teacher will follow the explanation of the students and then they will check their own work. Then after class, that is when they will send the pictures

of their works via messenger both the evaluation and seatworks.”

“Every after topic of a chapter. For example, our last topic is Chapter 16 about waves and sound. Before 16.1 I will give semi formative assessments and then followed by formal formative assessments. I will call 3-4 students then ask others if they agree or disagree with the other students. In problem solving, if they have different answers, I will counter check with other students and ask them to explain why.”

Teachers have different thoughts about the effectiveness of their formative assessment. Some of them agree that their formative assessment is effective and some are not. Teachers look into consideration of the students who really cannot cope up with the topic and are having a hard time understanding it. But mostly for them, the effectiveness is subjective to different external factors such as: internet connection, ambiance, and gadgets or even the number of formative assessments they can give.

#### *B. Performing Online Formative Assessment in Classroom Setup*

The teachers used different online formative assessments as stated earlier and the researchers also discovered that they use it mostly after every topic in their respective classes. When asked about on if they administer their formative assessment through flexible groupings, some teacher justified their answers as:

“If by individual mostly for problem solving and if by group more for conceptualization, like I will give them a scenario by group after discussion then breakout rooms, I will give them time to think about the given scenario.”

There are also teachers who prefer to assign their formative assessment individually rather than by group.

“Yes, I do give them formative assessments using flexible groupings but most of the time I give them individual Seatwork.”

Individual assessment is the one I prefer more than groupings because I want to hear them talk, especially in problem solving or conceptual examples without choices. I didn’t prefer groupings in formative assessment, however I still do groupings.”

When asked about their reasons for choosing individual work rather than groupings, they mentioned the following:

“One reason why I rarely use pair or grouping is the time, of course I have a lot of time for them to explain their work in the class. Another reason is the irresponsibility of some students, that when they do a task within the group some of them don’t

help and just let the leader and those who care do it.”

One of the respondents also emphasizes the difficulties they might encounter if he/ she will choose by group rather than individual formative assessment. Another teacher says,

“If by group they will only assign one, which for me it is harder to evaluate them using it. If I am the one to appoint who will talk in a specific group, then for me the other members of the group will only give them the things to discuss since it is easier to do in this set-up, yes it is learning but the thing is that the student doesn't create his/ her own explanation.”

Teachers perform their online formative assessment mostly during online classes, if not allowed by time, some of them do it during their asynchronous period. They also followed their daily routine which includes discussions before giving the assessments then right after, they will check the students answers and understanding about the lesson.

### C. Challenges in Providing Online Formative Assessments

The findings of this study discovered that the teachers face a lot of challenges while assessing their students in an online setup. The usual problem that we hear from the teacher is technical difficulties, additional work in terms of creating and using new applications for their formative assessment and limited time for assessment. Some teacher shared;

“When the student says he can't turn on the camera because of an internet connection problem, I don't have a choice but to have him take the test some other time but the problem is the student forgot the lesson by then already.”

“Mostly I encounter challenges like technical difficulties in our application KITE and also limited time since we only meet 2 meetings per week and one hour per session.”

“The way you present your formative assessment, of course more work in my end if online since you need to access different applications then create slides unlike traditional you can just write or show the question on the screen so it is integrated on the PowerPoint already then that's it.”

Another challenge of the teachers is cheating incidents or the integrity of the results of the formative assessment they gave to their students;

“Most and the usual challenge is the internet connection and we can't monitor if the student is cheating.”

“Of course the truthfulness or integrity of their answers because I don't know if it is coming from them really, unlike in face to face in which it is on

the spot you can check them. Since we are in an online set up it is really fast to connect with the others and they might be talking with the other students and it lacks in promotion of independent learning.”

The teachers also receive feedback from the students regarding their formative assessments. Noisy household/ distractions, having a hard time to upload their solution on the internet, limited time to accomplish the assessment and some students telling them that it is hard due to the topic they are teaching. When they are asked on how they address if there will be problems while assessing their students, here are their responses;

“When KITE doesn't work, they will send pictures then teachers will get the answers from the email.”

“I address the problem via messaging them in schoology (quiz). For online quiz bees, I usually assign one student who claims they have a strong internet connection to answer the question for their groups.”

“If the problem is uploading problem solving solutions I give them extra 5-10 min to upload their works after the test is close.”

There are also teachers who extend time and effort to clarify difficult topics for the students.

“I gave more sample problems to address the concept to better understand the topic if I have extra time.”

“The only problem is the students have a hard time understanding the problem. The way to address those problems is to let them do Academic Consultation with me if both of us are free. I tutor them.”

There are a lot of challenges that the teacher faces while assessing the students online. However, for the teachers we interviewed, there were advantages and disadvantages of doing online formative assessments. The teachers look at the advantage of the technology to be used for their assessment. Some teacher shared about;

“The Advantage is that there's a lot of resources to make use of as a formative assessment. Ease of access to summary of results with the use of KITE since the results are readily available and I don't need to check anymore.”

“Advantages of doing online formative assessment for me is that it is very flexible and also very convenient in terms of accessing the tool. They can open it on their phones, ipads and laptops.”

“For the advantages of online formative assessment, first it will be easy to check since the answers are already encoded together with the questions. Second, teachers receive continuous

feedback in real time. Third, flexible learning time allows students to have their own learning time.”

In contrast, there were also disadvantages of this, a lot of teachers still didn't believe in the integrity of the results even though they gave their best to lessen cheating incidents.

“I think there are more disadvantages such as it is definitely prone to cheating given it can be administered even not in face-to-face classes. Another one would be students are clever nowadays, they would have more than one device when taking exams so as a teacher you have to make sure your questions cannot be found on the internet which we have to be honest is sometimes an extra work.”

“Disadvantages are the integrity of their answers. You didn't know if they were the one who answered it or if it was just given to them, so for me it was cheating.”

“It has a lot of disadvantages, one of which is the reliability of the result, or if they have a tutor or parent on the side, or if they are in a video call with other students while taking the formative assessment.”

Aside from the integrity of the results, the teachers are also having a hard time to check papers, especially in problem solving, they need to check it one by one through their laptops and computers only. However this problem of the teacher sometimes leads to just letting their students check their own paper and submit it once they have the scores already in which it leads back to the first problem; the integrity of the results. Some teacher shared;

“One more disadvantage is that it is really hard to check since I need to check it one by one unlike in face to face classes where they can exchange papers so it is time consuming for me.”

“Another thing in Problem Solving I only let the students check their own work during online classes, then the only thing they submit is the checked one and I only look at the scores. I also can't explore it because of their handwriting, especially on problem solving.”

#### IV. DISCUSSIONS

The results of this current study on the practices of teachers in administering online formative assessments in this time of pandemic showed that the present situation shaped the ways on how Physics teachers assess their students. Hearing from the teachers' perspectives in their practices of online formative assessment and the challenges they faced as they shift from face-to-face to online distance learning denotes the importance of teacher-related preparedness in using available resources to continue the teaching-learning process.

The challenges and practices of the teachers in administering online formative assessments are greatly influenced by the readiness of the teachers in using different platforms to manage the new mode of teaching and learning being practiced during the Covid-19 pandemic. This study found three interesting aspects of online formative assessment: the practices in administering online formative assessment, the conduct of online formative assessments, and the challenges faced in administering the online formative assessment.

The findings of this study first showed that teachers retained some of the commonly used types of formative assessments using online formative assessment tools that are free such as the use of social media, slido, mentimeter, google forms, quizizz, jamboard and other tools that are convenient for both the teachers and the students. The different institutions also provide different online applications that are exclusive only for their faculty and students. With the use of different online platforms, the teachers created different practices to better incorporate and maximize the use of the above mentioned online tools. Teachers don't stop once they get the result of their assessment, rather they do follow up activities or let the students explain and answer the assessment in front of the other students. Second, the teachers preferred individual formative assessments rather than in groups. This brought sudden change in the atmosphere of the classroom. Students had very little time to interact with each other as the assessments were to be done individually. As for the teachers, more time is needed to facilitate the feedbacking of individual formative assessments. Although in some common type, unlike with the traditional, answers could already be included in the chosen online formative assessment tool or platform. Thirdly, as the shift towards online mode was rapid, challenges among teachers and students were increasing in number. These challenges were not limited to technical problems, online cheating, poor internet connectivity, and the like. The onset of the Covid-19 pandemic showed the importance of technology as a pedagogical resource. But with the challenges our teachers and students had faced and their experimented solutions for such challenges valued their efforts to handle the changes that are brought about by the shift to online distance learning because of the pandemic.

#### V. CONCLUSION

The research study was conducted to provide insight into the different practices that the Physics Teachers used in providing online formative assessment to their students in the midst of Covid-19 pandemic. Findings of this study revealed that the teachers have similarities and few differences in their practices when it comes to assessing their students online. The teachers' interview also revealed that they were first challenged in various ways, but that as the course progressed, they found ways to adapt their assessment techniques to the new setting. Generally, the findings of this study showed that for almost two years in this online distance setup, the teachers have shown resilience and creativity especially in administering online formative assessments. Nevertheless, the situation still

reports huge challenges such as internet connectivity, technological competence and readiness, online resources and integrity of the results. Although the pandemic accelerated the use of technology even in rural areas, there is still a need for solutions that are long lasting, affordable and effective.

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