

Online Assessment of Primary Students' Cognitive, Psychomotor, and Affective Domains: Practices from Urban and Rural Primary Schools in Indonesia

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Abstract. This study intends to describe assessment strategies for young students' online learning. The participants in this descriptive qualitative study were 15 primary school principals and 35 teachers teaching Years 4 and 5 in urban and rural schools on the island of Lombok, West Nusa Tenggara Province, who volunteered their participation after undergoing comparable procedures. Using operational concepts of assessment of learning for online learning, class observation, and interview were organized. The content and structure validity of the measures were evaluated in accordance with the developmental periods of young learners. The findings showed that the teachers assessed the primary students' cognitive, psychomotor, and affective domains interactively during the online class meetings, in their portfolio, and through attitude direct observation. Several assessment strategies were advocated to circumvent the shortcomings of online learning. A criterion-referenced evaluation was used to conduct the analysis. The theoretical implications of the findings suggest that the various assessment procedures adopted have decreased the negative washback of online exams; however, further research is required to determine the consistency of the outcomes of online tests with other types of evaluation.

1 Introduction

For two years, the use of technology has been accelerated in education due to the online learning policy correlated to the Covid-19 outbreak. The sudden shift from offline to online teaching has forced teachers to conduct teaching as well as assessment the ways they had yet to experience at Ghanbari [1]. However, some studies have shown that as teachers and students were getting used to digital integration in teaching and learning, a growing pattern of the operationalization of technology in online classes has also been reported [2] [3].

Only in mid of 2022, teaching and learning in Indonesia returned to face-to-face (FtF) mode after more than two years conducted virtually. Online learning in Indonesia was based on the Indonesian President's mandates in the government letter of the Ministry of Education

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and Culture No. 36603/A.A5/OT/2020 dated March 15, 2020, which regulated the official application of Working from Home (WFH), containing the physical interactions at all education levels. Electronic devices and internet-based applications were materialized during the WFH [4]. Measuring students' learning achievement online necessitates a sound methodology and teachers' technological literacy. Nevertheless, the implementation of online learning cannot be carried out optimally at primary schools because of some of which network constraints and the possessions of technological gadgets [5]. While most studies on online assessment have been focusing on this issue, little has been explored on how teachers could integrate the assessment of students' cognitive, psychomotor, and affective domains virtually. This study, therefore, sought evidence of the employment of online assessment strategies in rural and urban primary schools. In an attempt to uncover the integration of the three domains of competencies in online assessment, this study provides field convenience by displaying practices in advantaged and disadvantaged elementary schools.

2 Method

This qualitative study used interviews and focus group discussion (FGD) methods for data collection. Interviews and the FGD focused on aspects of online learning assessment during the online learning period. Meanwhile, informed consent was secured to ensure that the undertaking observes the ethical standards of research. During the online learning initiative, the data collection served both as an assessment approach and an evaluation of online learning. Document analysis of the outcomes of previous studies pertaining to the assessment of learning during the online learning period also supported the data analysis. Findings were determined after doing a qualitative thematic analysis of the data collected from respondents and having those findings corroborated by findings of comparable earlier research. The analysis employed an audit trail, member checking, and peer debriefing to avoid the potential biases of the results. An audit trail was used as a reference to countercheck information shared by the participants, while member checking and peer debriefing was used to validate the analysis and participants' answers.

2.1 Participants

Fifteen primary school principals and 35 rural and urban elementary school teachers teaching Years 4 and 5 on the island of Lombok, West Nusa Tenggara Province, Indonesia, participated in this qualitative study. The participants were from different districts and cities in the province. Forty percent of respondents taught at rural elementary schools, and sixty percent at urban schools. In addition, nine elementary school teachers and principals were randomly selected from each district or city. **Table 1** shows the distribution of the participants in each district or city.

Table 1. The participants.

School Principal	City of Mataram	West Lombok	Central Lombok	East Lombok	North Lombok	Total
	3	3	3	3	3	15
Year 4 & 5 teachers	6	6	6	6	6	30
Total	9	9	9	9	9	45

2.2 Instruments

In order to solicit the views of the teachers and the principals, a semi-structured interview and FGD protocol were prepared. Researchers used the related literature and their experiences with online assessment to develop the questions. The questions were prepared in Indonesian (i.e., the native language of the participants) to prevent any possible language impediment. The interviews were conducted for 30 to 45 minutes, depending on the flow and the development of the issues asked. In total, the 45 interviews were conducted for 1800 minutes. The FGD took 120 minutes, involving 50% of the participants (22), representing an equal number of participants from urban and rural schools. The interviews and FGD were audio-recorded and transcribed for the thematic analysis.

3 Result and Discussion

Overall, the analysis of the 45 interviews and one FGD revealed the practices and issues of assessing the cognitive, psychomotor, and affective domains of the students online. In the following, preceded by the conditions of online teaching and learning, each of these is explained.

3.1 Teaching and learning during online learning

In order to prevent the spread of Covid-19, online learning was enacted by following stringent health procedures. Even though there was an effort to enact hybrid learning, nearly all learning activities had to be completed in the comfort of students' own homes. Schools with limited access to technology for teaching and learning (weak wireless connections, few students with Android phones, few students with access to computers at home, etc.) often resorted to traditional, in-person methods of instruction.

For offline learning with house visits they were geared towards a residential zone of 3-5 persons. The teachers traveled to each student's house and met with a small group of them in a common room or other nearby locations. Learning took place away from a computer, with teachers making at least two weekly home visits to review lessons, assign minor projects, and keep a close watch on students' progress. Teachers and parents used non-school days to coordinate students' efforts on homework and projects sent to teachers via WhatsApp (WA) group application on an Android phone possessed by one of the group's students or parents. When parents participated in their children's education, they documented the experience and shared it with the teacher through images and videos. The teachers used the information as a basis for evaluating students' progress in the three domains cognitive, psychomotor, and affective. However, there were at least three remaining issues regarding the teachers' home visits. First, it was difficult for the teacher and students/parents to agree on the lesson plan's contents, resulting in an imbalance in the implementation of learning; second, teachers and students/parents could not follow the agreed schedule; and third, students/parents had difficulty capturing the teacher's programs and ideas when carrying out learning on days without the teachers' presence.

Online learning, on the other hand, was conducted in schools and by students with online devices such as Android smartphones. In relation to the restricted abilities and technologies that teachers, students, and/or parents possess, the teacher had to facilitate learning via accessible methods, such as WhatsApp, Google Form, Google Classroom, Google Drive, YouTube, and even Zoom sessions. WhatsApp was the most popular platform. The teacher started a WA group for all students to communicate assignment information and uploaded instructional videos. The WA group also recorded assignments in the form of photographs,

learning videos, and images of the completed job. Fifteen teachers reported that 91% of online learning was accomplished through transmitting materials to the WA group. The videos feature greetings to students as well as explanations of teaching materials and assignments. Students received assignments in the form of videos and worksheets. Students then completed the job manually. The outcomes of the tasks were photographed and submitted to the teacher via the WA group. In this case, WA groups provided instructors, students, and parents with a number of helpful features that may even be utilized for video conferences. Other teachers also preferred the Google Classroom, Google Drive, and Google Form application models, but the WA group was regarded to be more accessible, efficient, and effective.

3.2 Online assessment implementation plan

Under this theme, classroom activities roadmap, teacher-student and parent communication, hybrid scenario for assessment enactment, and assessment-specific strategies and criteria emerged as sub-themes. All primary school principals in this study were aware that the method for implementing learning into action begins with the teacher's work on an implementation plan. The learning implementation served as a roadmap for all classroom activities, including teacher-student and parent communication. Indicators pertaining to learning goals, learning materials and resources, online and offline learning phases, and assessment strategies and criteria are all part of the learning implementation plan. Teachers and parents agreed that the indicators for each learning component as a standard by which their interactions with students can be evaluated. In rural primary schools, the hybrid scenario for assessment was preferred as the two principals attested that:

The assessment during the online learning era was not totally implemented online, yet offline at students' homes because of insufficient electronic devices. Online activities were carried out only for sending assignments through the students' representatives, i.e., students who were supported by decent electronic and internet connection. Alternatively, students delivered their assignments to school once a week. The offline learning at students' homes was carried out in small groups with 3-5 members. The teachers home visited the group of students twice a week. The rest of the small-group learning was assisted by their parents.

When kids have Android smartphones and their schools have a strong internet connection, online learning is conveyed by delivering materials and other resources to the students through their parents. Teachers implemented the online learning platforms in WhatsApp, Google Forms, Google Classroom, Google Drive, Youtube, and Zoom Meeting [6]. Assignments were delivered via WhatsApp (WA) group in the form of questions, puzzles, and other types of tasks. The majority of the students' work was transmitted privately in WhatsApp straight to teachers. During the online learning era, the outcomes of students' work served as the foundation for evaluating learning processes and outcomes [7]. In comparison to rural schools, two urban school principals commented that:

Online learning was progressing successfully for all students at urban elementary schools. The teacher provided instructional videos, assessment tasks, and material distribution online. Students' final products, including recordings of the online learning process and pictures of their activities, were stored online. But, once a week, direct delivery of artwork to the school was favoured for items like handicrafts, art skills, and other types of artwork.

These products were the basis for evaluating the students' competence in terms of cognitive, psychomotor, and affective domains.

In addition to the hybrid scenario, one urban teacher admitted that teacher and student-parent communication was central for the online assessment. As the closest parties of the students, parents' assistance in communicating assessment actuated the functioning of the assessment.

Implementation of assessments during the online learning period demanded the active cooperation of students' parents. The effectiveness of the process and the outcomes of learning were significantly supported by the parent's assistance. In the online learning period, parents had four crucial roles to play in their children's education; namely, parents are the closest friends in the family setting, they are especially close to their children, and they are very responsible for the educational achievement of their children. Parents also motivate and encourage their children.

3.3 The online assessment enactment

Like other previous studies, this study confirms that internet-based applications such as quizzes, online tests, and other applications were deployed to assess and evaluate students' learning throughout the online learning era. Apart from the massive adoption, each urban and rural teacher reported that there were at least three issues with the internet network as an assessment medium. First, there was a disparity in access to technology and networks between rural and urban areas. Students in urban areas were more advantaged than those in rural territories. Second, teachers' limited literacy with online learning applications; and third, there was limited integration between teachers, students, and parents in online learning. The teacher's job during the online learning period was to implement technology transformation and migration from traditional to online learning so that educators and students/parents could engage in learning activities from different locations [8]. This was supported by Ocampo (2021), who emphasized the crucial role of technology in promoting effective learning to 21st-century students. He stressed that the role of technology is indispensable in creating an effective learning atmosphere where 21st-century learners can think critically and creatively during class discussion and evaluation. Furthermore, the data indicated that there were several issues associated with conducting learning and assessments during the online learning period, including: 1) assessment had not been able to maintain its principles properly; 2) inadequate educational competency in conducting online-based assessment; and 3) the absence of learning achievement standards [9].

3.4 Assessment strategies during online learning

Evaluation of learning during the online learning period necessitates the correct and precise approach at each stage. The mindset and strategic activities in the online assessment were oriented toward preserving assessment principles to the greatest extent possible. The assessment's guiding principles are instructive, sustainable, open, objective, and accountable. When confirming the strategies, they employed to construct assessments for online mode, the teachers reported that the standard procedures of assessment constructions needed to be simplified. The simplification was aimed at aligning the reduced curriculum content with the assessment. The simplification was conducted by identifying and determining the representative indicators of competencies in the curriculum, then followed by informing

those indicators to the student-parents so that they were fully informed about what to expect for the online assessment. During the online assessment, inevitably, the restricted ability of parents to utilize online technology was the first barrier to online schooling, followed by the quality of network connectivity issues, the usage of handphones by multiple users, as well as the poor quality of the cellphone for sending photos and movies. Nevertheless, the biggest challenge for teachers in conducting assessments online was to have evidence of the students' affective competencies, including the students' honesty and the authenticity of the completed tasks.

Assessment is the process of obtaining information based on the learning objectives of the pupils being evaluated. Assessment is the collection of data and measurement of student learning outcomes with the purpose of enhancing the quality of educational operations. The purpose of assessment is to determine the status of learning outcomes and student growth. Whereas measurement is the process of quantifying learning data using specific instruments, evaluation is the evaluation of learning data. Following the learning process, the measurement findings constitute the basis for assessing or interpreting student competence. Evaluation is a systematic and ongoing procedure for determining the quality of learning based on decision-making considerations and criteria. In an attempt to conduct assessment, measurement, assessment, and evaluation in a timely and effective manner, the following stages are necessary: 1) Formulating the objectives of learning evaluation and determining the domain to be evaluated (cognitive, affective, and psychomotor); 2) Selecting techniques and determining measurement instruments; 3) Determining benchmarks, norms, or evaluation criteria; 4) Formulating the interpretation and status of student learning outcomes. 5) Create a plan for follow-up.

3.5 Assessment of cognitive, psychomotor, and affective domains

The instructional technique influences the domain of student learning outcomes (cognitive/knowledge, affective/attitude, and psychomotor/skills). Adapting the determination of the learning domain to the learning objectives. The online implementation of assessment greatly restricted teacher-student/parent connection. Hence, the proportions of the cognitive, psychomotor, and affective domains must be reconstructed in accordance with the circumstances and restrictions of learning throughout the online learning era. The study reveals that the cognitive domain was reached the most, followed by psychomotor and affective.

The psychomotor domain could only be exposed through practical activities and examination of student's work, and issues emerged over the legitimacy of practical activities and student work. This led to a reduction in the validity of the psychomotor assessment outcomes. In order to reduce dishonesty in the process and outcomes of the tasks, it is necessary to do an in-depth analysis of the psychomotor domain's characteristics. Determining the affective domain was the most challenging aspect of learning during the online learning era. The Indonesian government regulated that the development of affective domain methodologies may be based on observation. However, the implementation of observations in online learning could have been improved, as they could only be undertaken based on secondary data from photographs and children's work submitted to the teacher. The study data also indicated that the proportions of cognitive, psychomotor, and affective skills were 60%, 30%, and 10%, respectively.

While selecting a technique and determining the measurement instrument, the technique was tailored to the type of data and the measured areas. Instruments may be chosen when they are suitable and of a fine standard. However, it could also be compiled in the absence of excellent instruments. Preparation of instruments must adhere to standards and procedures, but in evaluating learning outcomes during the online learning period, teachers prioritized

content validation, i.e., adaptation to learning objectives and valid arrangements based on students' language skills. The assessment techniques that could be chosen included: first, online-based techniques by administering tests with Google forms; second, portfolio technique, which was a collection of documents by a student/group of students to be documented about the learning process and work results. The portfolio contained teacher notes, student work results, and student development profiles; and third, feasible observation of the attitude or characters of the individual students' behavior patterns during the home visit.

Teachers established assessment benchmarks to test and evaluate learning outcomes throughout the online learning period in a variety of ways. The instructors agreed, in principle, to simplify the measurable indicators and minimize the criterion for learning outcomes' completeness. Minimum completeness criteria ranged from 65 to 75 percent, with scores ranging from 50 to 100 percent. At the same time, the utilized reference was the benchmark reference guideline. Formulating the interpretation and status of student learning outcomes and defining the status of assessment results from activities of assessing learning outcomes during the online learning period yielded a moderate score, i.e., in the optimal average range of 50-100, i.e., 75%. When assessing summative assessment scores, there are two classifications: good and good enough.

Assessments for the affective domain were carried out on features of student participation in learning that encouraged student independence. These tasks included activities such as submitting tasks punctually, enforcement of independent completion of the tasks as well as individual submission of the tasks. In the online learning age, learning assessment methodologies utilize a variety of resources, such as Google Forms [6] [8] [10]. The use of Google Forms is confirmed in this study because of its efficiency, practicality, and its compatibility with other Google services. Google Form was also believed to measure the actual attainment of student learning outcomes [11].

4 Conclusion

Learning during the pandemic era exhibited a paradigm shift, which resulted in a reduction in student passion for learning and impaired the learner's ability to understand the topic. Education and learning must continue during the online learning era, despite the need to adjust paradigms, models, and methodologies to the circumstances.

The study indicates that online learning in Primary Schools took place in one of two models. These models were: first, for institutions of higher education, students, and parents who had access to only partially functional online learning tools, and the implementation of a face-to-face learning model (home visit) in small groups (3-5 students). The home visit activity was carried out by the teachers, who traveled to a student's residence or another location with a group of other students to learn in person. Assessment and evaluation were done on a continual basis during the learning process using different observational methods, various works, and interviews. Using various online learning tools was the strategy that the educator employed to optimize the learning potential of the students within the online learning time frame [12]. Alterations to the instructional model were required to be followed by modifications to the assessment of the students' acquired knowledge.

Google Forms was confirmed to be dominantly employed for cognitive/knowledge assessment, as well as online test techniques. The affective/attitude evaluation employs an evaluation strategy based on the application of observational techniques to learning videos and student work items. For the home visit, direct observation was used throughout learning activities and student work processes. An online psychomotor/skills assessment technique was implemented by assessing student work delivered over WhatsApp as photographs. In contrast, the home visit was limited to psychomotor domains/skills, which were observed

through the work process and students' work. The teacher could apply an assessment approach, portfolio assessment, and self-evaluation to ensure that every student had a comprehensive file of their learning activities and their finest effort as the learning products. In order to reveal a comprehensive and integrative realm of learning outcomes, it was necessary to modify assessment procedures and assessments in a precise and accurate manner in response to shifts in learning.

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