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Developing the Event, Duration, Latency, and Interval (EDLI) Assessment Techniques to Measure Student Engagement and Motivation in Islamic Religious Education Online Courses

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ABSTRACT

Purpose - The purpose of this study is to develop Event, Duration, Latency and Interval (EDLI) Assessment Techniques to Measure Student Learning Engagement and Motivation in Online Learning

Design/methods/approach – This study used a research and development (R&D) framework by Borg & Gall which consists of (1) Research and information collecting, (2) Planning, (3) Developing preliminary form of product, (4) Preliminary field testing, and (5) Operational field testing. The research subjects were lecturers at 5 universities in North Maluku province who implement online learning, totaling 10 lecturers. Data analysis using the Aiken Index to determine product validity criteria.

Findings – The results of the social behavior in online learning experts assessed 83% of the products developed as valid, then experts in the field of learning media assessed 83% of the products developed as valid, finally experts in the field of IT development assessed 83% of the products developed as valid.

Research implications/limitations – The Event, Duration, Latency, and Interval (EDLI) assessment technique guide is applicable for all lecturers conducting online learning. However, due to researcher limitations, product trials during the Operational Field Testing stage cannot be conducted at all universities in North Maluku Province and are restricted to universities in the city of Ternate.

Originality/value – The importance of a guide that explains procedures for assessing student performance during online learning is especially related to student motivation and involvement, and the Event, Duration, Latency, and Interval (EDLI) procedure is very relevant for use in assessing student performance during online learning.

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Introduction

The availability of adequate Internet access has changed the way people work and revolutionized several aspects of education, as it has become more widely used and enhanced its function as a communication medium. In the context of higher education, the advent of online education has given students more access to higher education than ever before (Aristovnik, Karampelas, Umek, & Ravšelj, 2023). Online courses have had a significant impact on higher education, supported by adequate internet access and electronic devices, requiring lecturers to continue to develop their approaches to ensure every student receives quality lectures. In its implementation, the online learning process in higher education must be accompanied by an assessment of the student's learning process since it provides detailed information about learning and academic development and is used to improve student learning and development (Doo, Bonk, & Heo, 2020).

In 2020, the Ministry of Education and Culture (MoEC) affirmed that permission for face-to-face learning activities in universities and community polytechnics/academies in the even semester of the 2020/2021 Academic Year could be carried out in a combination of (hybrid learning), online, and face-to-face, with strict health protocols. It further affirmed the importance of assessment in online lectures as an integral part of a quality lecture process (Hoi, Sahoo, Lu, & Zhao, 2021). Through appropriate assessment techniques, a lecturer can understand and improve students' academic achievement in the form of direct observation of their abilities and skills. The assessment process is conducted not only to support students' learning process but also to provide real-time feedback for lecturers to make changes to teaching based on assessment findings, ensuring teaching strategies are aligned with students' needs. Assessment in the lecture process is also pivotal to measuring the success of the learning system run by a lecturer.

Although assessment in online lectures is very important for universities to ensure that learning objectives can be achieved optimally, it still faces many obstacles in its applications, including its focus that has not emphasized student behavior, learning assessment has not been positioned as part of online learning integration and is not contextual and contrary to learning content (Hoi et al., 2021). Therefore, efforts to develop applicable guidelines for lecturers to assess student academic performance during online lectures are very crucial. It aims to produce a product that guides lecturers in assessing the online lecture process that focuses on motivational behavior and learning engagement using the Event, Duration, Latency, and Interval (EDLI) stages.

Mukhtar explained some of the obstacles and challenges of assessment in the online lecture process. One of them is that most universities do not have a lecture process assessment guide that represents online lectures. In fact, if an assessment guide for the online lecture process is available, it is often limited to assessing student performance on surface activities, such as turning on the camera during the lecture process, responding during the presence, and responding to the lecturer (Mukhtar, Javed, Arooj, & Sethi, 2020). Meanwhile, matters related to psychological aspects during online lectures tend to be ignored, especially student motivation and involvement in online lectures. It happens because online learning takes place without direct face-to-face interaction, making

lecturers face difficulties in measuring the quality of student performance through motivation and learning engagement.

In addition, almost all lecturers have difficulty developing assessment instruments independently. The ability of lecturers to develop assessment tools reflects the quality of learning in higher education. Some lecturers do not understand good assessment instruments, making them unable to develop assessment tools independently. Every university hopes that the assessment carried out by a lecturer is truly an authentic assessment, allowing the lecture process carried out by a lecturer who is truly qualified or eligible following the demands of the government in the educational assessment standards (Ladyanna & Aslinda, 2021).

Implementing assessment in online courses at universities in Indonesia has become an essential need, especially in online courses. In its application, assessment in courses is divided into two types, namely summative and formative assessment. Formative assessment is a representation of assessment in online lectures because it not only achieves the expected lecture results but also improves the quality of online lectures. Therefore, assessment should be viewed as a process that lecturers should use throughout the lecture, not merely as an afterthought or summative goal at the end of the lecture (Lu & Cutumisu, 2022). Formative assessment is an assessment of the lecture process carried out by lecturers to help students achieve their best ability goals and is a very important part of the learning process. Assessment in the lecture process can also help lecturers focus on students during the lecture process in class.

In the context of the stages in assessment, online courses use Applied Behavior Analysis (ABA) procedures to identify changes in behavior in students. ABA comes from the behavioral sciences and can help people learn, change behavior, and possibly result in the ability to live a better quality of life. ABA is not a single "thing" or technique. It is a large set of combined procedures and principles to help teach new skills, generalize behaviors (or use them across multiple settings), and reduce challenging behaviors (Bailey, Baker, Rzeszutek, & Lanovaz, 2021). Assessment in online courses also sometimes causes a lack of uniformity in conceptualizing the format, mode, and variation in assessment procedures, requiring a systematic approach to collecting information about students and their course processes through the use of information and communication technology, aiming at concluding the individual's abilities (Yin, Yuan, & Zhang, 2017). Accordingly, the Event, Duration, Latency, and Interval (EDLI) assessment stages were formulated to guide lecturers in conducting assessments.

Methods

This study used the Borg & Gall research and development model due to its purpose to develop and validate educational products. The results of development research were not only the development of an existing product but also finding knowledge or answers to practical problems in the education and learning process.

Borg & Gall's research and development consists of 10 stages. However this study only carried out up to stage 5 which consists of (1) Research and information collecting, (2)

Planning, (3) Developing a preliminary form of product, (4) Preliminary field testing, and (5) Operational field testing to produce a valid Event, Duration, Latency, and Interval (EDLI) assessment technique guide model product to measure Student Engagement and Learning Motivation in Islamic Religious Education Online Lectures (Sarpong, Boakye, Ofosu, & Botchie, 2023). Therefore, the procedures in the ADDIE development model were not applied to all development stages but only used as procedures in developing assessment technique guides (Kartikasari, Iriani, & Satyawati, 2023)

This research involved eight (8) experts of social behavior experts, educational evaluation experts, media experts, and IT experts. The experts involved are included in the Preliminary Field Testing stage, which is tested on a limited scale to several experts consisting of 3-8 experts through interviews, questionnaires, or observations to obtain and analyze data for the next step. Therefore, at this stage, a content validity test was conducted by experts to assess the content of the prepared assessment guide, those related to the content in terms of social behavior, educator evaluation, learning media, and information technology (IT). In each category in the expert test, two experts provide an assessment. Furthermore, Main Field Testing was conducted, involving 10 lecturers at five universities spread across the province of North Maluku.

The research process involved the following steps: 1) Initial information gathering, which began with reviewing relevant literature, including books and articles on assessment procedures in learning, student engagement and motivation, and online learning concepts. This stage also included conducting a needs analysis by interviewing several lecturers at universities in North Maluku province to identify their needs for the developed product, and finally, designing a framework for the educational product; 2) Development of the initial version of the product. Here, researchers create the initial product, which is an online learning assessment guide using the Event, Duration, Latency, and Interval (EDLI) model; 3) Initial field trials, where researchers conduct product validity tests with four experts in social behavior, educational evaluation, media, and IT; 4) Product main revision, which involves making improvements to the product based on feedback from initial field trials. Revisions may occur several times depending on the results of the pilot test, preparing the product for wider testing; and 5) Main field trial, where the product is tested by lecturers conducting online learning in several universities in North Maluku province to collect feedback and comments from users on the EDLI assessment guide.

In this study, only 5 of the 10 Borg and Gall development steps were followed since the stages of this research were divided into two main stages, namely the product development and testing stages and the product dissemination stage. Accordingly, the first stage of this research focused more on product development and testing which consisted of 5 stages.

Data collection was conducted in two stages, namely the initial field trial and the main field trial. The instruments used consisted of The suitability scale of the assessment guide with indicators of social behavior in the classroom, the suitability scale of the assessment guide with educational evaluation indicators, the suitability scale of the assessment guide with standard educational media criteria, the suitability scale for

applying IT in the assessment guide, and the scale of ability to carry out assessment on online lectures. All scales contained 25 statement items that have gone through the validity test process. The scale used in this questionnaire was Likert-type, which used positive statements consisting of items with score levels ranging from 1) strongly disagree, 2) disagree, 3) agree, and 4) strongly agree. The data analysis technique used in analyzing content validity was the Aikens Index through analyzing aspects of usefulness, attractiveness, clarity, and ease of procedure, whereas testing inter-rater reliability used the Cohen Kappa test.

Results and Discussion

Online lectures allow qualified access anywhere and anytime and enable immediate knowledge verification. The role of online lectures is also increasingly recognized as a necessity along with government support for the necessity to integrate Information and Communication Technologies (ICT) in education. The rapid development of Information and Communication Technologies (ICT) has a positive impact on learning by using online lectures that present a cheaper and cost-effective approach to lectures in higher education, allowing students to easily exchange the information and data they have (Nurjaman & Sabilah, 2022). The quality of the online lecture process is largely determined by the lecturer's ability to assess the lecture process that has taken place through objective assessment procedures, especially in online lectures conducted without going through the face-to-face process directly in the classroom.

Several aspects of lecturing and assessment need to be considered when switching from face-to-face to online learning, especially assessment techniques that are effective in meeting the challenges of online lectures and designing assessments and materials that can increase student engagement (Vien, Ai, & Sung, 2019). It should be a concern for all lecturers that changes in the lecture process do not change learning outcomes but can also change the nature of the assessment required and the quality of the assessment itself, more particularly when assessing lecture processes that emphasize practical skills and experiments, requiring assessment procedures that match the characteristics of the lecture. However, there are still a number of problems in formulating assessment procedures in online courses influenced by the following factors.

Problem I	Problem II	Problem III
There are still inconsistencies regarding the methods, formats, and types of online course assessments that can be used, despite the increasingly rapid use of assessments in online courses, and can also be used to make various judgments about students' academic performance.	Sometimes the material or content is only theoretical and does not allow students to practice and learn effectively, which can affect their assessment results. Other factors that also contribute to assessment problems are lecturers' lack of knowledge on how to assess students, the limited ability to design	Assessment in online lectures focuses more on quizzes so that they merely tend to measure theoretical knowledge but are less able to measure the skills or practice of the concepts learned. Quizzes also often focus on multiple choice or short answer questions, which may not be sufficient

	assessment guidelines or instruments that are relevant to the online lecture context.	to assess analytical and critical thinking skills. Moreover, the assessment process of the lecture process, which only refers to quizzes, is likely to ignore the psychological aspects possessed by students during online lectures.

In addition, the researchers obtained data related to the types of problems or obstacles faced by lecturers in conducting assessments in online lectures on eight (8) lecturers who carried out online lectures.

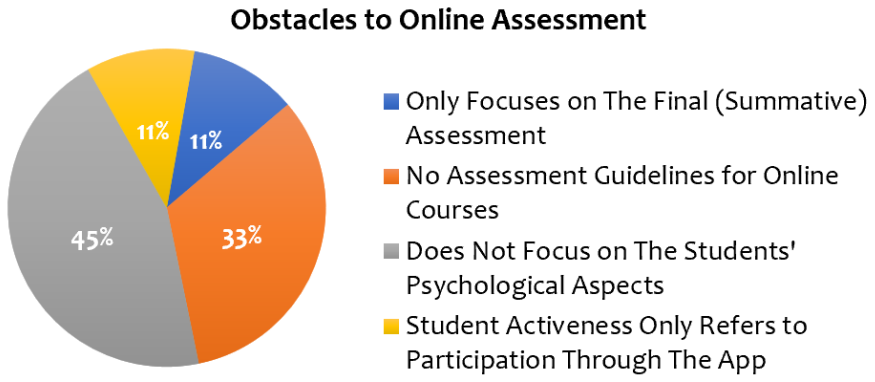

Image 1. Obstacles to Online Assessment

From the figure, we can see that the largest number of problems faced by lecturers while assessing the online lecture process was assessment activities that did not focus on the students' psychological aspects, reported by three (3) lecturers with a percentage of 45%. Meanwhile, the lowest category was problems related to the assessment process that only focused on the final (summative) assessment and the student activeness level merely referred to participation via application, reported by one (1) lecturer with a percentage of 11%. Based on these preliminary data, a procedural guide is required to describe the stages of assessment in online lectures that focus on aspects of student motivation and involvement in lectures. To get a clear picture of whether the educational product developed meets the eligibility criteria based on the results of the initial field test and the main field test, the following researchers described the stages of product development they had carried out.

Premilinary Field Test

The product testing generated in this study aimed at obtaining direct feedback from social behavior experts, educational evaluation experts, learning media experts, and IT experts. Additionally, researchers conducted a validity test consisting of three aspects, namely aspects of clarity, aspects of accuracy, and aspects of suitability. The expert

assessment instrument used contains several aspects related to the model being developed, namely aspects of learning behavior, aspects of learning evaluation, and aspects of learning media, as well as aspects of IT development by referring to the criteria for clarity aspects, accuracy aspects, and suitability aspects. The learning behavior aspect aimed at testing whether the developed guide provided clear, accurate, and appropriate behavioral descriptions that demonstrate student engagement and motivation during online learning.

The learning evaluation aspect aimed at testing whether the developed model has been provided following the procedures for evaluating the online learning process. The learning media aspect aimed at testing whether the guide has been developed using appropriate media in assessing students' engagement level and learning motivation in online learning. The subject of this design validation for experts consisted of eight (8) people, namely social behavior experts, educational evaluation experts, learning media experts, and IT experts. At this stage, content validity was conducted to obtain eligibility criteria for the product that had been designedContent presence (content accuracy) used Aiken.

The criteria used to evaluate the suitability of this EDLI assessment guide were Not Relevant (NR) with a score of 1, Less Relevant (LR) with a score of 2, Sufficient (S) with a score of 3, Relevant (R) with a score of 4, and Very Relevant with a score of 5 according to the following table.

Table 1. Inter-Rater Validation Results of learning media expert

No.	Dimension	Score		Average	Catagory
		Expert 1	Expert 2		
1.	Clarity of Instructions/hints in the guide book	5	5	5	Very Relevant
2	Readability of the text on the guide book	4	5	4,5	Very Relevant
3	Accuracy of the layout in the guide book	4	4	4	Relevant
4	Accuracy of the material presented	4	5	4,5	Very Relevant
Average				**4,5**	**Very Relevant**

Based on the expert assessment, it can be concluded that the EDLI assessment technique guide developed has a score of 4.5 and indicates that the EDLI assessment technique guide is very relevant to be used in assessing the level of student motivation and learning engagement in online courses. Furthermore, based on the interview, the description of comments at the expert testing stage is as follows:

Table 2. Comments and suggestions from learning media expert

Media Suggestions and comments on product development from media experts
The assessment model listed in the guide should use terms that are easy for product users to understand.

Based on the data from the evaluation results, it appeared that without adequate explanation of the use instructions, lecturers had difficulty in using the EDLI assessment technique guide. Farida has also provided criteria for guidebooks that are easy for users to follow, including using language that is easy to understand or avoiding jargon or complex technical terms without explanation. In addition, organize the content with a logical and easy-to-follow structure, such as introduction, main content, and conclusion. Use subheadings to separate each section. Finally, explain each step in detail and sequentially using bullet points or numbers to make it easier for readers to follow the instructions (Farida, Destiniar, & Fuadiah, 2022).

Furthermore, the evaluation was conducted by experts in the field of learning evaluation to measure the suitability and effectiveness of the stages of learning assessment procedures listed in the EDLI assessment guide, and whether they meet the appropriate criteria or not. The following is a description of the product evaluation results:

Table 3. Inter-Rater Validation Results of learning evaluation expert

No.	Dimension	Score		Average	Catagory
		Expert 1	Expert 2		
1	Conformity of Event Procedures With The Steps in The Guidebook	5	4	4,5	Very Relevant
2	Conformity of The Duration Procedure With The Steps in The Manual	4	5	4,5	Very Relevant
3	Compliance of Latency Procedures With The Steps in The Manual	4	4	4	Relevant
4	Conformity of Interval Procedures With The Steps in The Manual	4	4	4	Very Relevant
Average				**4**	**Relevant**

Based on the expert assessment, it can be concluded that the developed EDLI assessment technique guide received a score of 4, indicating that the EDLI assessment technique guide is relevant to be used to assess the level of student motivation and learning engagement in online courses. Moreover, the evaluation was conducted by experts in the field of learning evaluation to measure the suitability of the learning behavior assessment procedures in the Event, Duration, Latency, and Interval procedures, whether they are appropriate or not, as follows.

Table 4. Comments and suggestions from learning evaluation expert

Suggestions and comments on product development from educational evaluation experts
The assessment format needs to be prepared practically, increase literature study; and it is necessary to prepare special instruments to assess the implementation of the guidelines.

Based on the data from the evaluation results, it can be seen that the evaluation format provided in the EDLI evaluation guide has a significant role for lecturers, which serves as the key evaluation tool in the online learning process. However, the experts assessed that the guide developed had not provided a detailed description of the stages

to use the assessment instruments listed in the guidebook. It is following the recommendation. The criteria for a good learning evaluation guidebook include several important aspects, namely having clear and well-defined objectives. It includes an outline of what is expected from the learning evaluation and how the results will be used. The content of the guidebook should be in line with the curriculum.

The learning evaluation should reflect the competencies and standards set in the curriculum. Also, the guide should include a variety of evaluation methods, such as written tests, performance assessments, projects, portfolios, observations, etc. (Zhu, Zhu, & Li, 2023). Furthermore, the assessment was conducted by experts in the field of social behavior aimed at measuring the suitability of the measurement tools listed in the EDLI evaluation guide with the characteristics of student behavior in online courses, namely behaviors that demonstrate engagement and motivation to learn. The following is a description of the social behavior expert assessment:

Table 5. Inter-Rater Validation Results of social behavior expert

No.	Dimension	Score		Average	Catagory
		Expert 1	Expert 2		
1	Accuracy of assessment procedures in measuring the level of increase in individual knowledge	5	4	4,5	Very Relevant
2	Suitability of assessment procedures in measuring an individual's level of experience regarding the material presented	4	5	4,5	Very Relevant
3	The accuracy of the assessment procedure in measuring the level of individual practical abilities	4	4	4	Relevant
4	Clarity of assessment procedures in measuring observable behavior	5	5	5	Very Relevant
Average				**4,5**	**Relevant**

Based on the expert assessment, it can be concluded that the developed Event, Duration, Latency, and Interval (EDLI) assessment technique guide scored 4.5, indicating that the guide was very relevant. It is suitable for assessing student behavior related to motivation and engagement level in online courses. Moreover, based on the interviews, it appeared that the learning behavior indicators measured were in accordance with the theoretical criteria formulated by experts on learning theory. The following is a description of the product assessment results:

Table 6. Comments and suggestions from social behavior expert

Advice and comments on product development from social behavior experts
Lecturers who use the EDLI assessment model guide need to be trained beforehand to master the characteristics of social behavior in the context of online lectures so that lecturers as users can identify student involvement correctly.

Based on the evaluation data, it is evident that the evaluation format outlined in the EDLI guidelines plays a crucial role in helping lecturers thoroughly understand the dimensions related to behavioral theory. This understanding enables them to accurately evaluate students' learning behavior during online lectures. The final evaluation was carried out by experts in information technology to assess the sustainability of the developed product, aiming to integrate it with the evaluation processes embedded within the campus website portal, known as SIAKAD. Below is a detailed description of the product assessment results:

Table 7. Inter-Rater Validation Results of IT Expert

No.	Dimension	Score		Average	Catagory
		Expert 1	Expert 2		
1	Suitability of The Application or Software Used	4	4	4	Very Relevant
2	Accuracy in Using Interactive Devices	4	4	4	Very Relevant
3	Accuracy in Hardware Use	4	4	4	Relevant
4	Adequate Internet Access for Online Lectures	5	4	4,5	Very Relevant
Average				**4**	**Very Relevant**

Based on the data from the evaluation results, we can see that the evaluation format available in the EDLI evaluation guide had an essential role for lecturers in comprehensively understanding the dimensions related to behavioral theory, making it easier for them to assess student learning behavior accurately in online lectures. Finally, an evaluation was conducted by experts in the field of IT to assess the sustainability of the product developed in an effort to integrate it with the evaluation of the lecture process included in the campus website portal called SIAKAD. The following is a description of the results of the product assessment:

Table 8. Comments and suggestions from IT Expert

Suggestions and comments on products from IT experts
The development of this EDLI assessment guide is relevant to future e-learning development plans at IAIN Ternate. To facilitate the evaluation process using the EDLI model in evaluating the level of student involvement and motivation during online learning, assessment activities are needed. Peer-assessment, namely providing adequate applications for lecturers who are given responsibility as lecturers to assess online learning activities. In this way, very young lecturers carry out assessments in online learning. In particular, PTID tries to create applications related to the peer-assessment process which aims to collect data related to learning.

Overall, the results of the assessment by experts in social behavior, learning evaluation, learning media, learning media, and IT are outlined in the following table:

Table 9. Inter-Rater Validation Results

Assessed Aspects	Number of Raters	Mean Validation Score	P Value	Category
Social Behavior in Online Learning	2	0,83	0,40	valid
Learning Evaluation in Online Learning	2	0,75	0,40	valid
Learning Media	2	0,83	0,40	valid
IT Development	2	0,83	0,40	valid

Table 9 shows that the developed product is valid because the value of Aiken's V coefficient ranges from 0 - 1. Coefficients of 0.83 (social behavior in the online learning aspect), 0.75 (learning evaluation in the online learning aspect), 0.83 (learning media), and 0.83 (IT development) can be considered to have adequate content validity.

Main Field Test

This stage is also called the primary test, where educational products are revised and tested on a wider scale with several stakeholders consisting of product users, namely lecturers in universities. Therefore, this stage involved ten (10) lecturers spread across five (5) public and private universities in North Maluku Province. At this stage, the research process is carried out through trial activities, namely by asking each lecturer to use the guidebook that has been developed for online lecture activities. It is done to assess student engagement and motivation in online learning. Additionally, it was concluded that there has been a guide on event, duration, latency, and interval (EDLI) techniques to measure student involvement in online learning in higher education.

In addition, it is expected that lecturers will have the ability to accurately measure student engagement in online learning through the results of the Wilcoxon Signed Ranks test. The Wilcoxon Signed Ranks test is conducted to compare the location of two populations using two suitable samples. It is done to investigate changes in an individual's condition in scores from specific time intervals. This test also aims to compare individual differences among students. Furthermore, variance analysis is carried out to determine whether they are statistically different from each other. The basis for decision-making in the Wilcoxon test is determined. If Asymp sig 2 has a probability value of <0.05, then there is a difference in the mean. The results of the analysis using the SPSS 16.0 program by using the Wilcoxon Sign Test data analysis technique showed that Asymp. Sign (2 Tailed) < 0.05. It can be concluded that there is an average difference in the lecturer's ability to evaluate student involvement in online learning before and after. Event, duration, latent, and interval (EDLI) as an assessment guide to measure student engagement and motivation in online learning in higher education. For more details, see Table 10 below:

Table 10. Wilcoxon Signed Ranks Test statistics

	POST TEST - PRE TEST
Z	-3.411[a]
Asymp. Sig. (2-tailed)	.001

a. Based on negative ranks.
b. Wilcoxon Signed Ranks Test

The value of Sig. (2-tailed)) was 0.001, thus, it is smaller (<) than 0.05. It can be concluded that there is an average difference in the ability of lecturers to evaluate student involvement and motivation in online learning before and after applying the technical guidelines for event, duration, latency, and interval (EDLI) assessment to measure student involvement and motivation in online learning in higher education.

The results of this study are in line with research conducted by (Faizaturrohmah, Sukarni, & Ngafif, 2022). Using the right assessment techniques in online lectures can provide accurate information about how well students are learning, thereby contributing to important decisions that will affect their future. Online lectures require assessment techniques that can really measure progress during the learning process and also present transparent performance criteria to students through the use of important questions and assessment rubrics, allowing students to find out what learning behaviors can be shown during online lectures that contribute to the quality of performance appraisals during online lectures. Assessments in online lectures also play a significant role in tracking how well the class, as well as students individually, understand the subject matter (Jerez, Baloian, & Zurita, 2017).

Motivation and involvement in learning as a psychological dimension of each student need to be translated into observable behaviors, especially in online lectures, to determine the level of student performance through an in-depth understanding of student characteristics, task dimensions, and environmental characteristics. From the point of view of environmental characteristics, online lectures as a learning environment certainly highly affect student performance levels since the functional approach focuses on identifying the causes, consequences, and events of the environmental setting that are considered crucial factors that may be functionally related to particular behaviors (Ningsih, 2023). When behavioral indicators of motivation and learning engagement are comprehensively understood by educators, the process of assessing student behavior becomes more accurate. It enables an impact on positive behavior support programs or academic instruction designed to help students meet their needs in a more adaptive and appropriate way.

Using the EDLI assessment technique model allows lecturers to always maintain the quality of the lecture process even through the online process and also to make more efforts to understand the characteristics of each student in-depth, and to direct students more towards active learning in the classroom. Also, it provides awareness to lecturers about the learning influence of assessment practices in higher education, enabling them to

make changes during the lecture process. Therefore, the results of this research can be implemented in the future. The EDLI assessment technique in online lectures can encourage lecturers to collect information about their student's performance and achievements, especially formative assessments that occur continuously throughout the learning process (Kaya-Capocci, O'Leary, & Costello, 2022). Of course, active engagement is key to effective learning and assessment. When students are encouraged to engage with the subject matter, they are more likely to understand and retain the information. Formative assessments, especially when involving the active participation of both students and instructors, provide valuable feedback that helps tailor teaching methods to better suit the needs of individual learners. This approach encourages a dynamic learning environment where students feel more invested in their own progress and development.

When students are actively involved in activities, improvements in learner performance are achieved through supportive feedback from various assessment tasks. The EDLI assessment technique is an assessment procedure for the learning process that refers to the principles of behavioristic learning theory, where one of its disciplines is manifested in Applied Behavior Analysis (ABA), emphasizing that a person's behavior can be assessed based on indicators that are observable, objectively defined, and measurable. Furthermore, behaviorism as a learning theory is a basic competency possessed by every lecturer at the university level that has even been applied in the lecture process based on the principle that people learn through their interaction with the environment, stating that learning is a change in observable behavior resulting from experience, therefore, completely under the control of the lecturer (Morris & Peterson, 2022).

Each lecturer must have the ability to develop diverse assessment skills since using various assessment methods helps them adjust teaching strategies throughout the course to facilitate student learning. The study showed that assessment did not only measure the extent of a student's understanding but also contributed significantly to the learning process itself. The phenomenon of the "testing effect" emphasizes that students obtain greater learning benefits from repeated testing compared to focusing only on the learning material (Galindo, Candeias, Pires, Grácio, & Stück, 2018). In addition to the material obtained, such as through lectures or study sessions that help in information retention, it is also crucial for students to be actively involved in retrieving and applying the information. Regular assessments conducted throughout the learning period provide students with the opportunity for essential practice necessary for effective learning.

EDLI's assessment techniques for assessing students' level of motivation and learning engagement in online lectures will provide feedback to lecturers on their effectiveness as educators and provide students with a measure of their progress as learners, as well as provide information about what, how much, and how well students learn. Every lecturer in higher education needs to be aware of the necessity for assessment in online lectures, i.e. how lecturers assess student progress formatively and summatively, how they distribute the activities assessed throughout the course, the problems involved in providing effective feedback, and the strategies with which they experiment to overcome these challenges.

EDLI assessment model can improve lecturers' abilities in (1) time management, (2) student responsibilities and initiatives, (3) the structure of the online medium, (4) content complexity, and (5) informal assessments. Meanwhile, using assessment techniques to evaluate students' level of motivation and learning engagement in online lectures will make it easier for lecturers to understand the process of data collection and analysis to determine the function of the behaviors shown in online learning.

EDLI technical assessment is part of a behavioral assessment procedure that emphasizes the assessment and measurement of various behavioral constituents that indicate why a particular behavior occurs and what causes that behavior. This will include open-mindedness, feelings, and cognition, as well as their controlling variables that can come from within and outside the individual. In online learning of Islamic religious education in higher education, this will not make it difficult for lecturers if they become innovative and creative educators through three stages, namely: 1) Learning planning, 2) Learning implementation, and 3) Learning evaluation (Nailasariy, Habibi, Kubro, Nurhaliza, & Setyaningrum, 2023).

The EDLI assessment technique can be successful when the focus is on behavior, both visible and hidden, measured or evaluated as it occurs in a given situation. The behavior is observed at a specific time and in a limited location. Observers are trained to use various techniques of measuring behavioral assessments, equalizing recording, and collecting information objectively. Observers are expected to achieve the specified standards of consistency in collecting data, recording information, and interpreting data. Lecturers, as educators at the higher education level, must always have the ability as observers to collect information about the performance and achievements of their students so that it leads to an improvement in student learning.

This ability must be applied in the Behavior Assessment procedures or related to student performance assessment in the lecture process. Behavioral assessment is helpful for analyzing unwanted behaviors and also in changing those behaviors into desired ones. It includes the Behavior Analysis techniques that form the basis for all behavior assessment and modification procedures. Behavioral analysis results in the initial analysis of problem situations, clarification of problems, motivation analysis, development analysis, self-control analysis, analysis of social relationships, and analysis of socio-cultural-physical aspects of the environment.

Conclusion

The wave of assessment in online lectures is positioned as a systematic basis for making conclusions about student learning and development. Specifically, assessment is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to improve student academic development and learning. Assessment guidelines are urgent for lecturers who carry out Online Learning to assess students' academic performance based on learning behaviors shown in the online lecture process. They are, especially, behaviors related to student learning motivation and engagement or involvement, so that the assessment not only focuses on descriptive ability but also

psychological aspects in online lectures by using assessment parameters on specific learning behaviors of students in online lectures, then assessing the duration of student learning behavior, the latency of learning behavior, and also intervals of behavior.

The assessment technique in the online learning (lecture) process that adopts the stages of Event, Duration, Latency, and Interval (EDLI) Assessment emphasizes the main focus on student behavior observed through interaction with video conferencing devices that show learning motivation and learning engagement behavior. This assessment procedure is used as most of the assessment procedure guidelines in online lectures have not paid attention to the psychological aspects reflected in student learning behavior. This study has developed an Event, Duration, Latency, and Interval (EDLI) assessment technique guide to guide lecturers in assessing the student's level of motivation and engagement during the online lecture process.

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