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ONLINE-BASED HISTORY LEARNING ASSESSMENT TO IMPROVE CRITICAL AND ANALYTICAL THINKING SKILLS

Fahrudin*

fahrudin@upy.ac.id(*)

Universitas PGRI Yogyakarta, Jl. PGRI I Sonosewu No. 117, Daerah Istimewa Yogyakarta, 55182, Indonesia

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Abstract: The objectives of this research are: (1) to develop an online-based history learning assessment design that meets high standards in terms of accessibility, completeness of assessment components, and visual appearance, and (2) to develop an online-based history learning assessment design with a high level of effectiveness in measuring students' critical and analytical thinking skills. This study employs an experimental method, with data collection conducted through questionnaires, interviews, and observations involving history teachers and eleventh-grade social science students at SMAN 1 Yogyakarta, SMAN 1 Godean, and SMAN 1 Bantul. The data analysis employs parametric statistics and an independent t-test to compare the experimental and control groups, determining the effectiveness level of the assessment design. The results of this study are as follows: (1) The developed online-based history learning assessment design has demonstrated high standards of accessibility, with a score of 19.21 and an achievement rate of 90%; completeness of assessment components, with a score of 18.11 and an achievement rate of 91.67%; and visual appearance, with a score of 17.66 and an achievement rate of 91.67% (2) The developed online-based history learning assessment design has been proven effective, as indicated by a significance value of $0.00 < 0.05$, confirming its effectiveness in measuring students' critical and analytical thinking skills. This effectiveness is further supported by improvements across six critical and analytical thinking indicators, which were higher in the experimental group than in the control group. These findings suggest that the proposed assessment design is viable and suitable for assessing students' critical and analytical thinking skills.

Keywords: Assessment design, online-based, history education, critical thinking, analytical thinking

Abstrak: Tujuan penelitian ini adalah: (1) untuk mengembangkan desain penilaian pembelajaran sejarah berbasis daring yang memenuhi standar tinggi dalam hal aksesibilitas, kelengkapan komponen penilaian, dan tampilan visual, dan (2) untuk mengembangkan desain penilaian pembelajaran sejarah berbasis daring dengan tingkat efektivitas yang tinggi dalam mengukur

kemampuan berpikir kritis dan analitis siswa. Penelitian ini menggunakan metode eksperimental, dengan pendataan dilakukan melalui kuesioner, wawancara, dan observasi yang melibatkan guru sejarah dan siswa ilmu sosial kelas 1 Yogyakarta, SMAN 1 Godean, dan SMAN 1 Bantul. Analisis data menggunakan statistik parametrik dan uji-t independen untuk membandingkan kelompok eksperimental dan kontrol, menentukan tingkat efektivitas desain penilaian. Adapun hasil penelitian ini adalah sebagai berikut: (1) Desain penilaian pembelajaran sejarah berbasis daring yang dikembangkan telah menunjukkan standar aksesibilitas yang tinggi, dengan skor 19,21 dan tingkat pencapaian 90%; kelengkapan komponen penilaian, dengan skor 18,11 dan tingkat pencapaian 91,67%; dan penampilan visual, dengan skor 17,66 dan tingkat pencapaian 91,67% (2) Desain penilaian pembelajaran sejarah berbasis online yang dikembangkan telah terbukti efektif, sebagaimana ditunjukkan dengan nilai signifikansi $0,00 < 0,05$, yang menegaskan efektivitasnya dalam mengukur kemampuan berpikir kritis dan analitis siswa. Efektivitas ini selanjutnya didukung oleh peningkatan di enam indikator berpikir kritis dan analitis, yang lebih tinggi pada kelompok eksperimental daripada pada kelompok kontrol. Temuan ini menunjukkan bahwa desain penilaian yang diusulkan layak dan cocok untuk menilai keterampilan berpikir kritis dan analitis siswa.

Kata kunci: Desain penilaian, berbasis online, pendidikan sejarah, berpikir kritis, berpikir analitis

PERKENALAN

Learning assessment is an important part of the learning process practice (Brohinsky, 2023). Assessment must be included in the planning of learning programs for teachers because it is a step in learning practice. It becomes a benchmark for teachers to see how much ability students gain in mastering the material (Anita et al., 2023). Thus, teachers need good and valid assessments when applied to students (Fahrudin et al., 2024) A good assessment is based on the learners' character. Meanwhile, valid assessments can periodically measure learner competencies achievement (Chin et al., 2022) For teachers, assessment occupies an important position considering that the teacher's job is not only to teach the material but also to help learners achieve the competencies achieved in the learning material that has been carried out (Ibagón Martín & Miralles Martínez, 2022). Thus, quality assessments must be owned by every teacher to observe the learning achievement of their students (Andersson & Palm, 2017).

Recent research on assessing history learning in high school still focuses on testing the quality of assessment instruments (Fahrudin & Saefudin, 2025). This is based on Jon Mueller's theory, which states that assessment is carried out to measure the quality of students' skills and knowledge produced through a reciprocal relationship between teachers and students in the learning process. This theory has underpinned the assessment paradigm that must play the role of teachers and learners in the assessment process and results (Borrero, 2023). The theory is less comprehensive in explaining assessment activities because it does not mention assessment methods, even though a good assessment is methodically robust (Fahrudin & Saefudin, 2025).

Ofianto researched to develop a manual-based assessment instrument to measure students' historical thinking skills. This research focuses on developing manual-based instruments, which are tested on school students (Ferine et al., 2024). The development of this kind of manual-based assessment instrument is considered ineffective for teachers and students in its implementation, considering the many problems of assessment with manual methods (Setiawan et al., 2020). With the manual method, teachers have difficulty analyzing students' critical and analytical thinking skills in history subjects (Fadli et al., 2021). Many students must be assessed, and the teacher's ability is limited (Darsono et al., 2024) With manual methods, teachers have difficulty conducting assessments because they must distribute and calculate the students' performance results themselves (Ferrarini et al., 2024). The process is tiring, so teachers often do not take the assessment seriously, which can result in the results not reflecting the true competence of each student (Fadli et al., 2021).

Research conducted by Lama Rajab concluded that learning assessment needs to be done manually because the teacher's role is so important in the assessment process (Rajab et al., 2024). Teachers must ensure that students do the assessment well without any obstacles (Afrianto & Fahrudin, 2022). Teachers can also directly observe assessment activities carried out by students (Nygren et al., 2019). The results of this study favor manual assessment, given the important role of teachers in the assessment process. Good assessment is not measured by whether or not the supervisor is present, but supervision can be done in many ways, such as online (Samuelsson, 2019). Online assessments require students to be more disciplined because the work can be timed as needed without being limited by class hours; with online assessments, performance documents will be neatly inventoried according to the names of each student so that it will be easy to find out if there is cheating by students (Z. Chen et al., 2024). In addition, online assessment is superior in terms of accuracy and validity because scores are calculated automatically, reducing teachers' subjectivity in assessing (Ferrarini et al., 2024). Through online assessment, teachers and students can reciprocate quickly without meeting in class (D. Chen et al., 2024; Fahrudin et al., 2025).

The inability of learners to understand historical concepts, low critical and analytical thinking skills, and difficulty in teachers properly evaluating learners' deep understanding of the context of historical material are problems caused by the weak manual assessment methods used by history teachers. The assessment method that history teachers should use is an assessment method that can provide an overview of students' progress in understanding historical material (Sader et al., 2022), critical and analytical thinking, and is technically easy for teachers to implement even with a large number of students (Kawuryan et al., 2022; Ofianto et al., 2022). The above problems must be solved by developing a more effective assessment design for history subjects.

The online assessment method is the right solution to solve the above problems. It is more effective because the analysis of students' data is carried out with information technology, which automatically describes students' understanding of historical concepts and critical and analytical thinking skills (Afrianto & Fahrudin, 2022). Technically, this online assessment method will help teachers simplify learner performance data by simply using online assessment features (Bures et al., 2022). These features include tools for collecting learners' assignments,

mutual assessment from teachers, and analyzing learners' competency progress (Setyowati et al., 2023). This online assessment method is technically effective for teachers and learners and can produce more valid analyses of learners' competency development (Fadli et al., 2022; Kawuryan et al., 2021). The design developed must be adjusted to solve the above problems. (Mulyana & Kurniawati, 2020) Thus, the first step in solving the above problems is to develop an online assessment model. This model needs to effectively measure students' critical and analytical thinking and analytical skills.

METODE

The research method used in this study is experimental. Firstly, the researcher collected information through a literature study on history learning assessment needs, challenges faced by teachers in assessment, and the design of an online-based history learning assessment model (Yang et al., 2022). Secondly, the researchers developed the design of an online-based history learning assessment model that meets the needs of teachers and learners as well as all components of history learning needs related to learning assessment (Widawski & Oleśniewicz, 2023). This stage includes analyzing the needs of teachers and learners related to online-based history learning assessment, identifying all components of history learning related to learning assessment, such as context, chronology, figures, events, and concepts, selecting the type of assessment that is by the learning objectives and components to be measured (Mulyana & Kurniawati, 2020), designing the assessment format to be used in the assessment platform, designing a clear and objective assessment rubric to measure students' ability to understand the tested history learning components, and integrating the design of the online-based history learning assessment model with online learning features (Galadini, 2022).

Third, the researchers tested the effectiveness of the online-based history learning assessment model by dividing the experimental and control classes from the XI social studies students at SMAN 1 Yogyakarta, SMAN 1 Godean, and SMAN 1 Bantul. The resulting data will be analyzed using content analysis techniques to obtain relevant findings on the effectiveness and feasibility of using online-based history learning assessment models (Domenici, 2023) Fourth, the researcher modifies the content and assessment instruments that contain cognitive, affective, and psychomotor aspects. The modification of content and assessment instruments for the online-based history learning assessment model was based on the test's effectiveness and feasibility results (Grover et al., 2022). Researchers also collected input and suggestions from history teachers regarding the completeness of the needs in the assessment developed to suit the character of history subjects (Saefudin et al., 2023). The results of the calculation in the experimental class and control class will determine how effective the assessment design has been developed (Visuddho et al., 2023).

FINDINGS AND DISCUSSION

RESULTS

Design Validity Test

After the online-based history learning assessment design has been developed, the next step is to conduct a trial of the resulting product. The validity test was carried out using the expert judgment method. Researchers asked three experts to assess the online-based history learning assessment design that had been made in terms of ease of access, completeness of assessment components, and appearance. The following is the interpretation of expert validation results using a conversion table.

Table 1. Criteria for Conversion of Quantitative Data to Qualitative Data

| Quantitative Score Range | Qualitative Criteria |
|-----------------------------------|----------------------|
| $\bar{x} > M + 1,5SB$ | Very good |
| $M + 0,5SB < \bar{x} < M + 1,5SB$ | Good |
| $M - 0,5SB < \bar{x} < M + 0,5SB$ | Fair |
| $M - 1,5SB < \bar{x} < M - 0,5SB$ | Less |
| $\bar{x} < M - 1,5SB$ | Very poor |

The quantitative score range in Table 1 above is then adjusted to the data processing needs in this study, with an ideal maximum score of 20 and an ideal minimum score of 4. The existing qualitative criteria are then interpreted to conclude the assessment results of the assessed standards.

Table 2. Conclusion of assessment criteria

| Quantitative Score Range | Qualitative Criteria | Conclusion |
|-----------------------------|----------------------|-----------------------------|
| $\bar{x} \geq 16$ | Very good | There is no need to revise. |
| $13,3 \leq \bar{x} < 16$ | Good | There is no need to revise |
| $10,67 \leq \bar{x} < 13,3$ | Fair | Revised |
| $8 \leq \bar{x} < 10,67$ | Deficient | Revised |
| $\bar{x} < 8$ | Very poor | Revised |

Design Feasibility Test

Three experts assessed accessibility standards. Based on the calculation results in Table 3, the 90% feasibility percentage of the prepared online-based history learning assessment design's ease of access is obtained. The average assessment from three experts on the standard of ease of access shows a score of 19.21, so it is considered very good and valid for use without revision.

Table 3. Results of Assessment Design Feasibility Assessment of Ease of Access Standard

| Expert | Total score | Maximum Score | Percentage |
|---------|-------------|---------------|------------|
| 1 | 17 | 20 | 80% |
| 2 | 20 | 20 | 95% |
| 3 | 20 | 20 | 95% |
| Total | 57 | 60 | |
| Average | 19,21 | | 90% |

Three experts conducted a standardized assessment of the completeness of the online-based history learning assessment design. Based on the calculation in Table 4, the percentage result for the completeness of the prepared assessment components is 91.67%. The average assessment of three experts on the standard completeness of the assessment components shows a score of 18.11, so it is considered very good and valid for use without revision.

Table 4. Results of Assessment Design Feasibility Assessment Standard Completeness of Assessment Components

| Expert | Total score | Maximum Score | Percentage |
|---------|-------------|---------------|------------|
| 1 | 18 | 20 | 95% |
| 2 | 18 | 20 | 85% |
| 3 | 19 | 20 | 95% |
| Total | 55 | 60 | |
| Average | 18,11 | | 91,67% |

Table 5 shows the results of the appearance standard assessment of the online-based history learning assessment design conducted by three experts. The percentage result of the standard display assessment is 91.67%. The average assessment of three experts on the standard completeness of the assessment components shows a score of 17.66, so it is considered very good and valid for use without revision.

Table 5. Results of the Assessment Design Feasibility Assessment of Display Standard

| Expert | Total score | Maximum Score | Percentage |
|---------|-------------|---------------|------------|
| 1 | 17 | 20 | 95% |
| 2 | 18 | 20 | 85% |
| 3 | 18 | 20 | 95% |
| Total | 53 | 60 | |
| Average | 17,66 | | 91,67% |

Design Effectiveness Test

The prerequisite test, normality and homogeneity tests, is the first step before the inferential statistical test. The normality test was carried out using the Shapiro-Wilk test on SPSS 16. The Shapiro-Wilk test was chosen because of the small number of samples taken. The results of the Shapiro-Wilk test can be seen in Table 6 below.

Table 6. Shapiro-Wilk SPSS Results

| Shapiro-Wilk | | | |
|--------------|-----------|----|------|
| Class | Statistic | df | Sig. |
| Experiment | .921 | 13 | .222 |
| Control | .869 | 13 | .059 |

The Shapiro-Wilk significance value in the experimental class shows 0.222. Meanwhile, the Shapiro-Wilk significance value in the control class is 0.059. The significance number > 0.05 indicates that the distribution of variables is normal, both in the experimental and control classes. The next step after doing the normality test is the homogeneity test. The homogeneity test was obtained by conducting the F Test. In the F Test, a significance value of 0.060 was

obtained. The significance value > 0.05 indicates that the data of the two groups are homogeneous. After the prerequisite test was met, the data was analyzed using the Independent T-test for a two-sample comparison test.

The error rate is 5%, so the H_0 hypothesis is accepted if $\text{sig.} > 0.05$. Conversely, H_0 is rejected if $\text{sig.} < 0.05$. In the Independent T-Test analysis results, the significance value shows $0.00 < 0.05$, so H_0 is rejected and accepts H_1 . The interpretation and acceptance of H_1 mean that the averages of the two sample groups are different, so learning in the experimental class is effective for students' critical analytical and analytical thinking skills. The effectiveness of using an online-based history learning assessment design is also shown in the assessment of each indicator of students' critical and analytical thinking. Researchers took six indicators to assess students' critical and analytical thinking skills. The results of the comparison of each indicator in the experimental and control classes are shown in Table 7.

Table 7. Percentage Results of Each Indicator of Critical and Analytical Thinking and Analytical

| No. | Indicator | % Experimental Class | % Control Class |
|-----|------------------------------------|----------------------|-----------------|
| 1 | Finding the problem | 79,70% | 74,66% |
| 2 | Characterizing the problem | 75,71% | 67,10% |
| 3 | Logic of argument | 90,18% | 81,12 % |
| 4 | Accuracy of reasoning and evidence | 79,21% | 70,15% |
| 5 | Developing an interpretation | 79,20% | 70,15% |
| 6 | Summarising the results | 83,51% | 70,80% |

Discussion

Development of Online-Based History Learning Assessment Design

State of the Art and novelty in this design lies in the type of formative assessment and rubrics implemented through the online system (Budiastuti et al., 2023). Formative assessment allows learners to receive continuous feedback and helps teachers understand learners' progress (Andersson & Palm, 2017). By applying formative assessment, the depth of understanding of historical material and learners' critical and analytical thinking skills will be easily achieved (Ozan & Kincal, 2018) Rubrics can be used in learners' assignments to help them

understand the assessment criteria and improve their critical and analytical thinking skills. In addition, rubrics can help teachers produce valid scores based on guidelines designed through an online system. Formative assessment types and rubrics supported by an online system will help teachers provide more effective learning assessments (Sottiyotin et al., 2023), develop students' critical and analytical thinking skills in understanding history, and facilitate a more interactive and memorable teaching and learning process (Capella peris et al., 2020).

The formative assessment and rubrics differ from previous studies. They prioritize the assumptive type by conducting assessments at the end of basic competencies in each material (Yang et al., 2022). Formative teachers can provide assessments to students in the learning process (Damkuvienė et al., 2023) History learning improves noble behaviors, so formative assessment is more suitable because attitude assessment needs to be carried out continuously. At the same time, the rubric type was chosen because it matches the online assessment design (Z. Chen et al., 2024). History teachers often use rubrics to implement manual assessments (Camacho-Tamayo & Bernal-Ballen, 2023) However, it has the disadvantage that rubrics are difficult to use because teachers have to assess many students with predetermined formulas, even though the number of students is very large and divided into several classes (Ferrarini et al., 2024). Thus, teachers need much time to correct the students' assessment results (Bartlett et al., 2023). This difficulty causes teachers to choose not to apply rubrics and assess subjectively quickly (Sottiyotin et al., 2023). The application of rubrics in this study answers these problems by applying rubrics in online assessment (Mankute et al., 2023) Through online teaching, teachers only set the score in the provided settings; then, the score is done automatically so that teachers do not have difficulty assessing many students (Higham et al., 2023).

Effectiveness of Online-Based History Learning Assessment Design

Before the effectiveness test, a feasibility test was carried out on the ease of access standards, completeness of assessment components, and appearance. The results above show that the assessment design that has been prepared has high standard achievement in terms of ease of access, completeness of assessment components, and appearance. These three components are the eligibility standards for online-based assessments (Kneifel et al., 2023; Widawski & Oleśniewicz, 2023). Online assessments with easy access can provide convenience for history teachers who still rarely use assessments with online models (Samuelsson, 2019), so it is difficult for history teachers to adapt (Samuelsson, 2019). The completeness of the assessment components in the online assessment design makes it easier for history teachers to use it because it is the understanding of history teachers in carrying out assessments so far (Nygren et al., 2019). Meanwhile, an attractive appearance certainly gives teachers more interest in using it and is easy to understand for both history teachers and students in conducting feedback in the assessment process (Miralles-Martínez et al., 2019).

The characteristics of online-based history learning assessment are believed to be more effective because they suit the needs of history subjects (Bîrle, 2022; Brewis & Hannan, 2023). Online assessments are used so that teachers can provide real-time feedback through online learning platforms (Bîrle, 2022) So that learners can correct their mistakes and improve their understanding (Li et al., 2023). Online assessment can help teachers more effectively assess higher-order thinking skills and deep understanding (Al Maani & Shanti, 2023). In the online

learning design model, teachers can easily assign tasks to learners (Sousa et al., 2022) So that learners can understand the assessment criteria and improve their critical and analytical thinking skills (Ibagón Martín & Miralles Martínez, 2022) In addition, online assessments can help teachers produce valid scores based on guidelines designed through online systems (Constantin et al., 2022; Jauhainen & Guerra, 2023).

Researchers tested the effectiveness of an online-based history learning assessment design to measure students' critical and analytical thinking and analytical skills with experimental research methods (Bures et al., 2022). The research model used was Posttest Only Control Design in Posttest Only Control Design. In each indicator of critical and analytical thinking skills, the experimental class is always superior compared to the percentage of the control class. The most striking difference is seen in the indicator of concluding results. The indicator was 83.51% in the experimental class and 70.80% in the control class. Combining all indicators resulted in an average percentage of 83.91% for the experimental class and 71.53% for the control class. So, it can be seen that the online-based history learning assessment design developed is very effective for increasing students' critical and analytical thinking.

Assessment using the online-based history learning assessment design for learning evaluation that researchers have developed will improve students' critical and analytical abilities. Thus, learners with critical and analytical thinking skills can be identified more accurately (Adway, 2023). Teachers can use it easily because it has been designed to suit the character of history subjects. The difficulties experienced by teachers in mapping the abilities of diverse students can be resolved with this design because it can describe in detail each student's critical and analytical thinking abilities. In addition, this design can also describe the abilities of all learners in the cognitive, affective, and psychomotor domains so that it can be used as material to evaluate the next learning program. This kind of assessment design is certainly what every history teacher needs in order to be able to plan learning programs and monitor the results periodically.

KESIMPULAN

Desain sistem online telah menjadi solusi bagi guru sejarah yang mengalami kendala dalam pelaksanaan penilaian manual. Guru sejarah tidak lagi kesulitan menganalisis data kinerja siswa, yang banyak dan memakan banyak waktu. Melalui penilaian online, guru dapat dengan mudah mendapatkan hasil kinerja siswa yang akurat dan valid. Desain penilaian berbasis online secara efektif mengukur keterampilan berpikir kritis dan analitis siswa. Penilaian formatif memungkinkan peserta didik untuk menerima umpan balik berkelanjutan dan membantu guru memahami kemajuan peserta didik. Rubrik dapat digunakan dalam tugas peserta didik untuk memahami kriteria penilaian dan meningkatkan keterampilan berpikir kritis dan analitis. Desain penilaian berbasis online memudahkan guru sejarah untuk mengukur prestasi belajar secara berkala. Hasil pencapaian penilaian online yang valid dan sangat efektif dapat memberikan rekomendasi bagi guru sejarah dalam merencanakan pembelajaran ke depan. Dengan demikian, desain penilaian pembelajaran sejarah yang dikembangkan layak untuk guru sejarah dan siswa.

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