

Specifications and Performance of The Website-Based. Self-Assessment Nurul Application Using GTmetrix

Especificaciones y rendimiento del sitio web. Aplicación Nurul de autoevaluación mediante GTmetrix

*Nurul Ihsan, *Ardo Okilanda, *Saddam Al Aziz, **Zainal Abidin Nazaruddin, **Diyana Zulaika

*Universitas Negeri Padang, **Univeristi Teknologi Malaysia

Abstract. A student self-assessment application called Self-Assessment Nurul was developed. With this website-based application, students self-assess the sports practice video assignments they have made. This is called a form of self-assessment. Data source triangulation was applied to the student's self-assessment, where the teacher also assessed the students' assignments. Detailed specifications and performance testing of this website-based application are required. For this reason, descriptive research was carried out to explain the specifications and performance of this website. Testing was carried out using the GTMetrix application. Based on data analysis, it was concluded that the self-assessment application was in the "B" or Good category with a performance quality of 79%, and the application access speed was very fast, with an average of less than 3 seconds. This proves that this website-based self-assessment application can be used by students and teachers well without any significant problems in terms of both durability performance and access speed. This demonstrates the website-based self-assessment application's suitability for usage by students and teachers, as it exhibits excellent durability, performance, and access speed without any notable issues. However, it facilitates teachers' use during student exercises and enhances accessibility for students. It examines the performance of both the teacher and the students.

Key Words: Self-Assessment, Gtmetrix, Website, Performance, Browse Timings

Resumen. Se desarrolló una aplicación de autoevaluación de los estudiantes denominada Autoevaluación Nurul. Con esta aplicación basada en sitio web, los estudiantes autoevalúan los trabajos en vídeo de prácticas deportivas que han realizado. A esto se le llama una forma de autoevaluación. Se aplicó una triangulación de fuentes de datos a la autoevaluación del estudiante, donde el profesor también evaluó las tareas de los estudiantes. Se requieren especificaciones detalladas y pruebas de rendimiento de esta aplicación basada en sitio web. Por tal motivo, se realizó una investigación descriptiva para explicar las especificaciones y rendimiento de este sitio web. Las pruebas se realizaron utilizando la aplicación GTMetrix. Del análisis de datos se concluyó que la aplicación de autoevaluación se ubicó en la categoría "B" o Buena con una calidad de desempeño del 79%, y la velocidad de acceso a la aplicación fue muy rápida, con un promedio menor a 3 segundos. Esto demuestra que esta aplicación de autoevaluación basada en un sitio web puede ser utilizada por estudiantes y profesores sin problemas significativos en términos de durabilidad y velocidad de acceso. Esto demuestra la idoneidad de la aplicación de autoevaluación basada en sitio web para que la utilicen estudiantes y profesores, ya que exhibe una excelente durabilidad, rendimiento y velocidad de acceso sin problemas notables. Sin embargo, facilita el uso de los profesores durante los ejercicios de los estudiantes y mejora la accesibilidad para los estudiantes. Examina el desempeño tanto del profesor como de los estudiantes.

Palabras clave: autoevaluación, Gtmetrix, sitio web, rendimiento, tiempos de navegación

Fecha recepción: 16-03-24. Fecha de aceptación: 07-04-24

Nurul Ihsan

nurul_ihsan@fik.unp.ac.id

Introduction

Websites have become an important communication portal for most people (Garett et al., 2016; Komaini et al., 2023). Website users are from the world of work and education, namely teachers and students (Nofita Sari et al., 2022; Mukarromah & Wijayanti, 2021). For teachers and students, websites are useful as an alternative communication medium related to learning content, such as teaching materials, learning videos, assignments and assessments (Puspitarini & Hanif, 2019; Ayubi et al., 2022; Hardinata et al., 2023). Learning content on the website makes it easy for students to access anytime and anywhere. It makes it easier for teachers to collect, assess, and provide feedback on student activities and assignments, especially practical assignments or skills, through practice videos (Rawashdeh et al., 2021; Nelson et al., 2023; Yudi et al., 2024).

A website can be quality if viewed from a performance perspective (Arni et al., 2023; Kwangsawad et al., 2019; Kiram et al., 2023). Website performance shows the durability (performance metrics) and speed of the website

(browser timings) when accessed by visitors (Król, 2018; Bartuskova et al., 2016; Welling & White, 2006). The application used to measure website performance is GTMetrix (Armaini et al., 2022; Dawis & Setiawan, 2022; Tengriano et al., 2022). GTMetrix is a website-based application that can measure website quality simply by copying and pasting a website link into the GTMetrix menu (Armaini et al., 2022; Lestari & Susanto, 2017).

There are two main performance measurement criteria in GTMetrix: performance metrics and browser timings (Armaini et al., 2022). In the performance metrics criteria, there are six measurement indicators, namely First Contentful Paint (FCP), Speed Index (SI), Large Contentful Paint (LCP), Time to Interactive (TTI), Total Blocking Time (TBT), and Cumulative Layout Shift (CLS) (Juliane et al., 2019). In the browser timings criteria, there are nine measurement indicators, namely Redirect Duration, Time to First Byte, DOM Content Loaded Time, Connection Duration, First Paint, Onload, Backend, DOM Interactive, and Fully Loaded Time. This website performance assessment is a percentage; the higher the percentage, the more durable and faster a website is.

FCP is a performance metric that measures how quickly visitors can view actual content (i.e., text, images, video, etc.) on your page, with criteria "Good - nothing to do here" if FCP time is 0.9s or less, "OK, but consider improvement" if FCP time between 0.9s and 1.2s, "Longer than recommended" if FCP time between 1.2 and 1.6s, and "Much longer than recommended" if FCP time higher than 1.6s. (Mahadika et al., 2023; Zamora et al., 2023). SI is a performance metric that measures how quickly your page is visually complete above the fold, with criteria "Good - nothing to do here" if SI time is 1.3s or less, "OK, but consider improvement" if SI time between 1.3s and 1.7s, "Longer than recommended" if SI time between 1.7s and 2.3s, and "Much longer than recommended" if SI time higher than 2.3s (Muriyatmoko & Aziz Musthafa, 2022).

LCP is a performance metric that measures how long it takes for the largest "content element" (e.g., hero image, heading text, etc.) on your page to become visible within your visitor's viewport, with criteria "Good - nothing to do here" if LCP time is 1.2s or less, "OK, but consider improvement" if LCP time between 1.2s and 1.6s, "Longer than recommended" if LCP time between 1.6s and 2.4s, and "Much longer than recommended" if LCP time higher than 2.4s (Manuaba, 2021). TTI is a performance metric that measures a page's load responsiveness and helps identify situations where a page looks interactive but isn't, with criteria "Good - nothing to do here" if TTI time is 2.4s or less, "OK, but consider improvement" if TTI time between 2.4s and 3.2s, "Longer than recommended" if TTI time between 3.2s and 4.5s, and "Much longer than recommended" if TTI time higher than 4.5s (Zamora et al., 2023; Safira & Jati, 2023).

TBT is performance metric that measures the total amount of time your webpage was blocked, preventing the user from interacting with your page, with criteria "Good - nothing to do here" if TBT time is 0.1s or less, "OK, but consider improvement" if TBT time between 0.1s and 0.2s, "Longer than recommended" if TBT time between 0.2s and 0.3s, and "Much longer than recommended" if TBT time higher than 0.3s (Zamora et al., 2023). CLS is a performance metric to measure the perceived visual stability of a page load, with criteria "Good - nothing to do here" if CLS time is 0.1s or less, "OK, but consider improvement" if CLS time between 0.1s and 0.15s, "Longer than recommended" if CLS time between 0.15s and 0.25s, and "Much longer than recommended" if CLS time higher than 0.25s (Zamora et al., 2023)

In the browser timings criteria, there are nine measurement indicators, namely Redirect Duration, Time to First Byte, DOM Content Loaded Time, Connection Duration, First Paint, Onload, Backend, DOM Interactive, and Fully Loaded Time. This website performance assessment is a percentage; the higher the percentage, the more durable and faster a website is (Dulaimi & Mashhadany, 2023). This research aims to evaluate the performance of a learning video content assessment application

called "Self Assessment Nurul". This application is web-site-based. This developed application contains a lesson material menu in the form of learning videos accompanied by an assessment grid and an assessment menu. The assessment in this application consists of 2: self-assessment and teacher assessment. Students carry out the self-assessment after watching examples of sports practice videos, practising and recording them, and finally uploading their independent practice videos to the application.

The overall test results of the website can be seen on GTMetrix Grade. Grade A if score 90 until 100, B if score 80 until 89, C if score 70 until 79, D if score 60 until 69, E if score 50 until 59, and F if score 0 until 49 (Muriyatmoko & Aziz Musthafa, 2022). The higher the grade, the better the performance of website-based applications (Armaini et al., 2022).

The function of this application is as a medium that helps students collect sports practice videos they have made (recorded) themselves. Then, the students assess the videos they have made according to the assessment rubric. The activity of students assessing themselves is called self-assessment. Self-assessment occurs when students judge their own work to improve performance as they identify discrepancies between current and desired performance (Hearn & McMillan, 2008). The long-term goal of self-assessment is to engage students as active participants in their learning and to confirm their learning, which reflects the results of their efforts in the educational process (Topping, 2003; Neldi et. al., 2023). The teacher's role is to check the student's self-assessment data again. This aims to ensure that the resulting assessment data is valid.

This principle of re-checking data from several people (teachers and students) is part of triangulation. Triangulation is a research approach combining various data sources, theories, or research methodologies to ensure that a research study's data, analysis, and findings are as complete and precise as possible (Sciberras & Dingli, 2023; Carter et al., 2014). Triangulation validates or expands existing findings from various perspectives (Turner & Turner, 2009). This triangulation helps comprehensively understand a thing or phenomenon (Bans-Akutey & Tiimub, 2021; Heale & Forbes, 2013; Carter et al., 2014). The phenomenon referred to in this research is the validity of student assignment self-assessment data in the application. This triangulation reduces the risk of incorrect data interpretation (Nasir & Sukmawati, 2023; Hammersley, 2009).

Based on the explanation above, it is necessary to explain the specifications of the application that has been designed and test the application's performance so that it can be concluded whether teachers and students can use the application or whether improvements need to be made. By assessing the application's performance using the GTMetrix application, it expect to gain insights on whether the application is suitable for educational purposes. The study's main objective is to examine if the application fulfills the required performance criteria for enabling smooth interaction and communication between profes-

sors and students during the self-assessment process. Therefore, the research aims to pinpoint possible areas for enhancement in the application's performance to improve its usability and efficacy in educational environments.

Material & methods

This research is descriptive. Descriptive research is defined as a research method that describes the characteristics of an object being researched, focusing more on the "what" of the research object or subject rather than the "why" of the research object or subject (Manjunatha. N, 2019). The material object in this research is a website-based application with the link <https://selfassessmentnurul.com/login>.

The decision to select GTMetrix for the collection of website performance data in this study stems from its provision of well-defined metrics that enjoy widespread recognition in the web development industry. GTMetrix provides researchers with convenient and user-friendly tools to effectively evaluate website performance, offering in-depth analysis of many performance factors. By utilizing GTMetrix, researchers may guarantee an impartial assessment of the application's performance, minimizing any personal biases. Furthermore, GTMetrix's standardized measurement criteria allow for accurate comparisons between various websites, making it easier to evaluate the application's performance in relation to industry standards. In this research setting, GTMetrix is an ideal alternative for objectively measuring and completely studying the application's performance.

Website specification data is collected from these links in the form of application screenshots. Website performance data is collected using the GTMetrix application, accessed at the link <https://gtmetrix.com/>. The performance measurements in GTMetrix are performance metrics and browser timings. Both data were analyzed descriptively using the Miles and Huberman method. Data analysis procedures include 1) Data presentation, namely the process of collecting information arranged in the form of written words, sentences, images, graphs or tables based on the required categories; 2) Data reduction, namely reducing data that is unnecessary and irrelevant, as well as adding data that is felt to be lacking; 3) Data verification, namely interpreting what is implied in the data that has been presented; and 4) Concluding (Wijaya, 2015).

Results

Application Specifications

The website specification content includes the login page, registration menu, dashboard, student data, lesson menu, lesson material menu, student self-assessment menu, teacher assessment menu, and assessment details. The following are the results of data collection related to website specifications:

Login Page

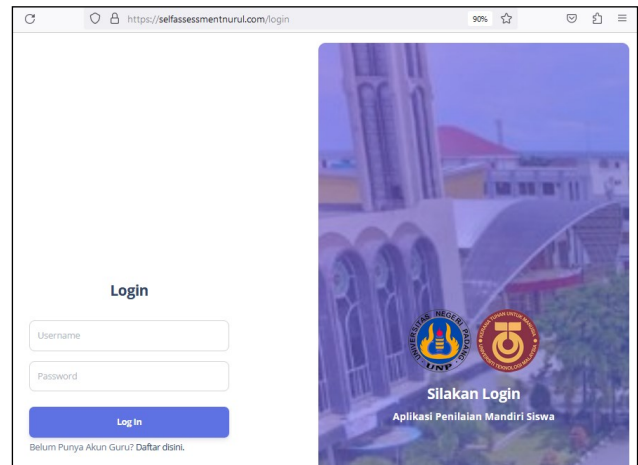


Figura.1. Teacher and Student Login Page

This login page can be accessed at the link: <https://selfassessmentnurul.com/login>. This website-based self-assessment application can be accessed on various browsers such as Mozilla Firefox, Google Chrome, Opera, Microsoft Edge, Safari, and others. On this page, account registration options for teachers are also displayed.

Registration Menu

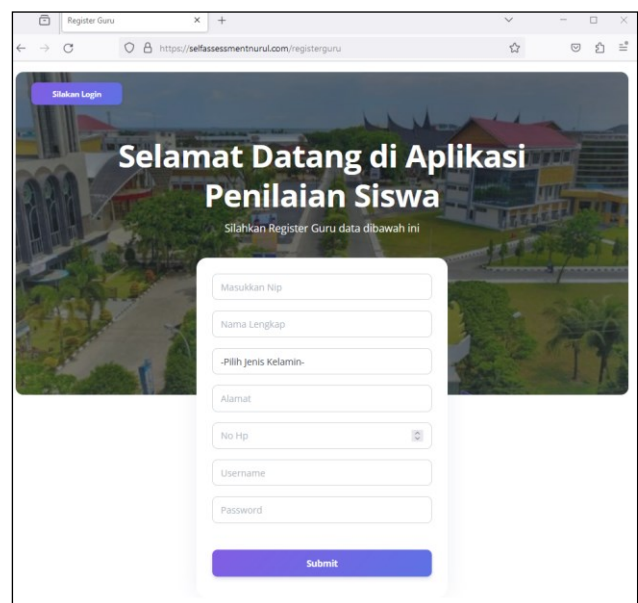


Figura.2. Account Registration Menu for Teachers

The registration menu page for teachers can be accessed at the link: <https://selfassessmentnurul.com/registerguru>. This page contains NIP, full name, gender, address, cellphone number, username and password.

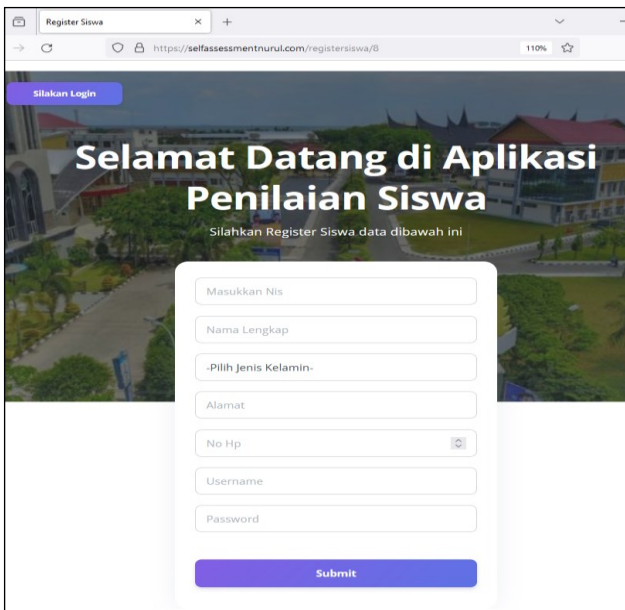


Figura 3. Account Registration Menu for Students

The student registration menu page is obtained from the teacher's account in the student menu, namely in the share register menu. Once the menu is clicked, the registration link for students will be automatically copied and can be shared with students. After students click the link, they face a page containing their NIS, full name, gender, address, cellphone number, username, and password.

Dashboard

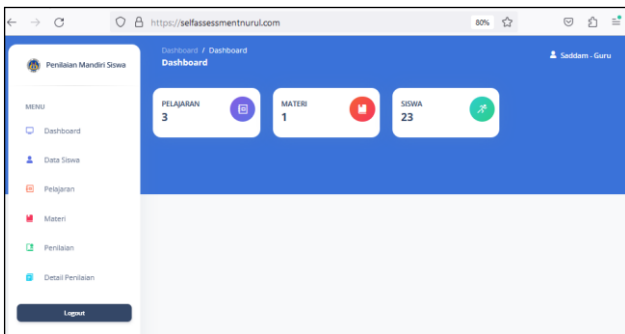


Fig.4. Teacher Dashboard Menu

The teacher dashboard page contains student data, subject name, lesson material content (video and assessment rubric), assessment from the teacher, as well as assessment details containing the final assessment report.

Student Data

This student data menu contains student biodata, namely NIS, full name, gender, address, cellphone number, username and password. In this menu, the teacher manually fills in student data. After that, a username and password are given to the student. This is one method of adding students to the application besides the automatic method, where students fill in their data.

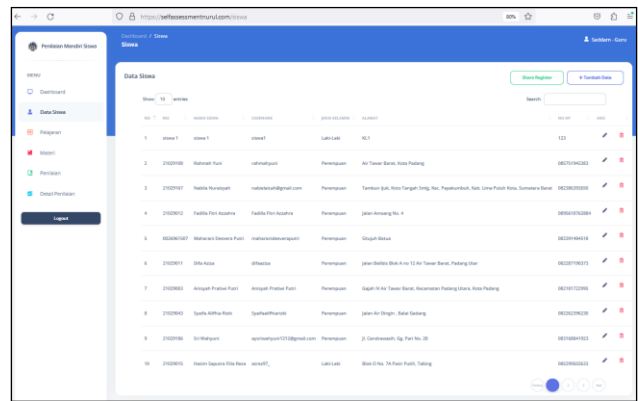


Fig.5. Menu Manual Input of Student Data by Teacher

Lesson Menu

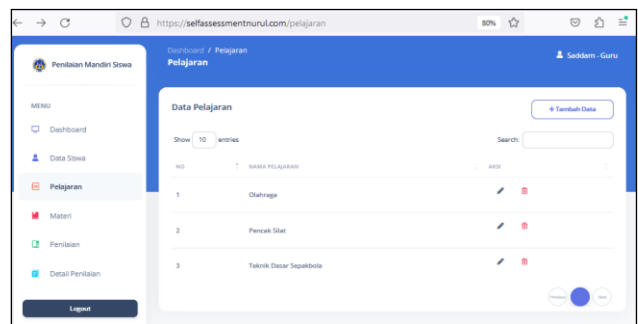


Fig.6. Subject Name Input Menu by Teacher

The teacher fills in this subject menu according to the subject taught. Teachers can add them and edit them.

Study Material Menu

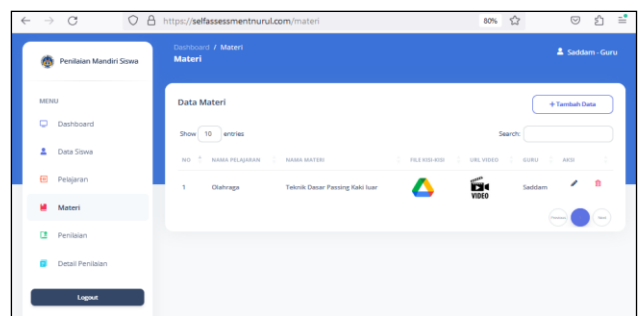


Fig.7. Subject Material Input Menu by Teacher

This subject matter menu contains the subject names that have been created previously. Teachers can input material in the form of video links for examples of sports practice and video assessment rubric file links. After that, students can watch the video, understand the assessment rubric, and submit their assignments.

Submit Assignment Menu

This assignment submission menu is in the student account. Students watch the video, understand the assessment rubric, and try to practice the video and record their practice.

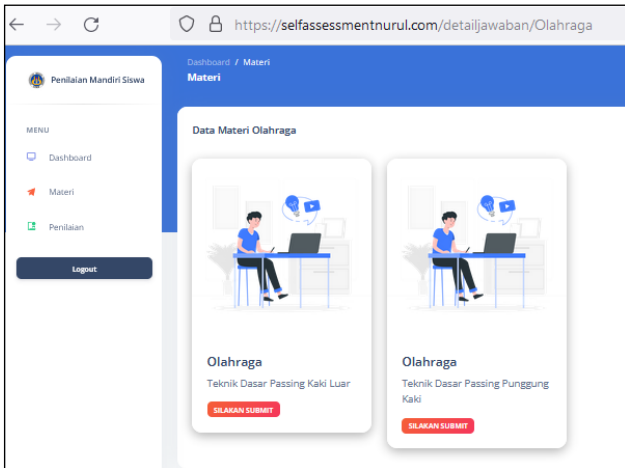


Fig. 8. Menu Submit Assignments by Students

Student Self-Assessment Menu

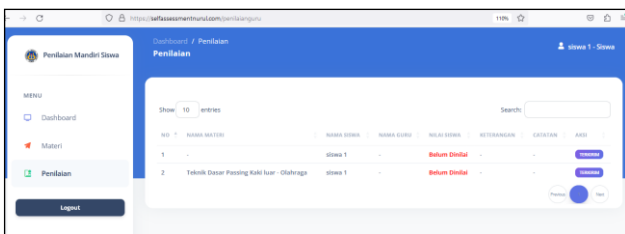


Fig.9. Self-Assessment Menu by Students

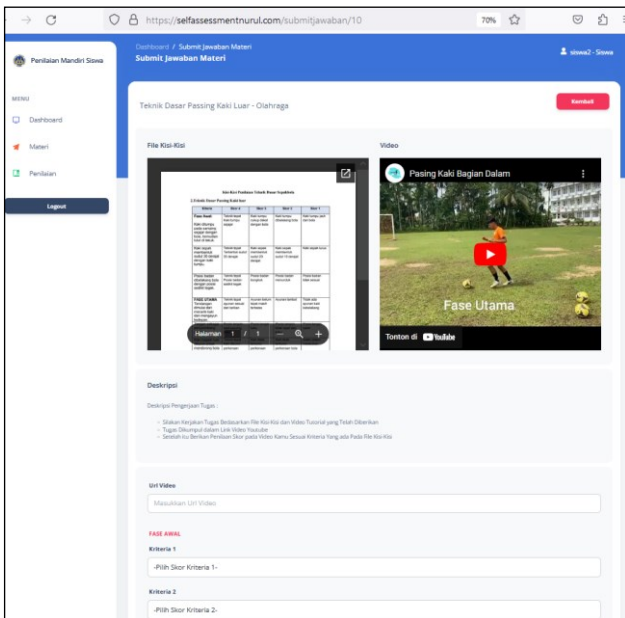


Fig.10. Insert Video Menu and Fill in Independent Grades by Students

The student self-assessment menu is in the student account. After students record their sports practice, they upload the video to YouTube or Google Drive, copy the link, and embed it in the video URL menu. In the final step, students self-assess the uploaded video according to the rubric in the menu.

Teacher Assessment Menu

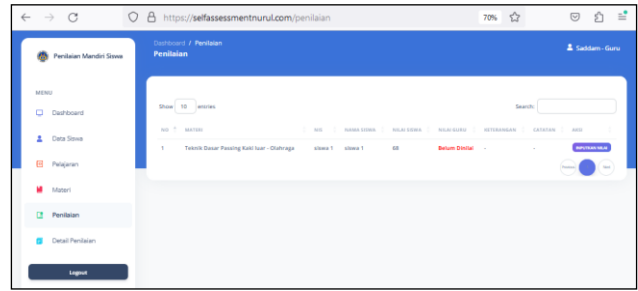


Fig.11. Teacher Assessment Menu

The teacher assessment menu is in the teacher account. In this section, there is a triangulation of data sources. This is because the self-assessment carried out by students will be checked again by the teacher. The decision taken by the teacher is to ask students to correct the video and reassess if the teacher's score is different from the student's score.

Assessment Details

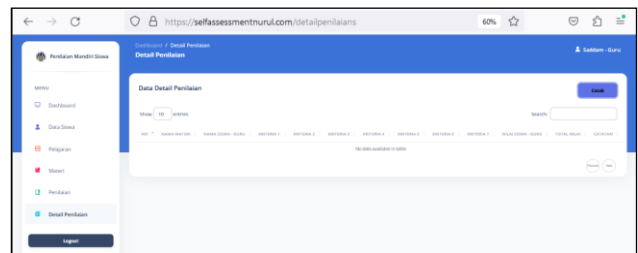


Fig.12. Menu Details of Assessment (Report) by Teacher

The detailed assessment menu is in the teacher's account. After students correct and reassess the video assignment, the teacher will assess it again. If the teacher's grade is the same as the student's, the grade will be entered in the report menu.

Website Performance Data

The website specification content includes the login page, registration menu, dashboard, student data, lesson menu, lesson material menu, student self-assessment menu, teacher assessment menu, and assessment details. The following are the results of data collection related to website specifications:

GTmetrix Grade

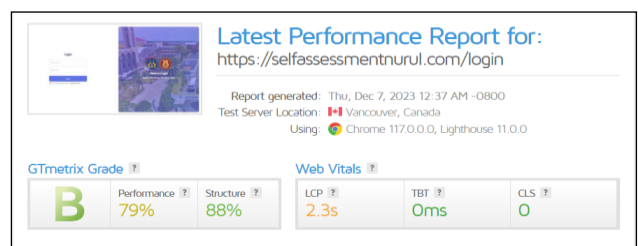


Fig.13. Gtmetrix Grade Website

The performance metrics test results can be seen in Figure 13. Based on this data, it can be seen that 3 of the 6 indicators are in the "good" category. The longest indicator is 2.3s or 2300ms, and the fastest is 0ms. Overall, the performance of the self-assessment application is relatively good.

Performance Metrics

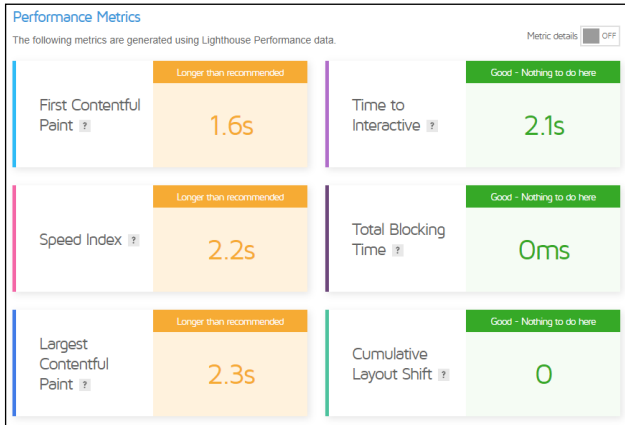


Figura. 14. Performance Metrics Results

The results of the performance metrics test can be seen in Figure 14. Based on this data, it can be seen that 3 of the 6 indicators are in the "good" category. The longest indicator is 2.3s or 2300ms, and the fastest is 0ms. Overall, the performance of the self-assessment application is relatively good.

Browser Timings

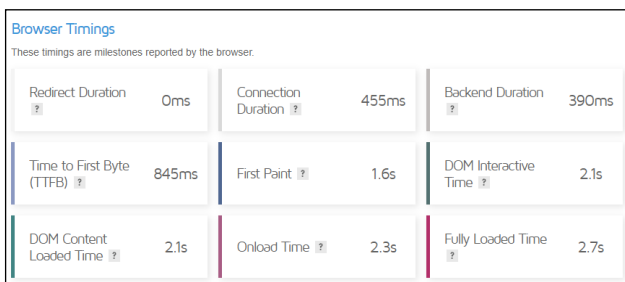


Figura15. Browser Timings Website Results

The results of the browser timings test can be seen in Figure 15. Based on this data, the browser timings of the 9 indicators are the longest, 2.7s or 2700ms and the fastest, 0ms. This shows that overall, the time required to access the self-assessment application is only a few seconds or less than 3 seconds and is relatively fast.

The application specs, encompassing login, registration, dashboard, and content menus, guarantee a seamless user onboarding experience and effective administration of learning materials. Features such as the ability to submit assignments and engage in self-assessment allow students to actively participate in their learning process. Furthermore, the triangulation of assessment data

between teachers and students guarantees fair and transparent evaluations. Additionally, the website's strong performance metrics and rapid browser timing enhance the user experience by guaranteeing swift access and smooth interaction. Collectively, these factors improve the ease of use and efficiency, creating a favourable atmosphere for meaningful educational interactions and knowledge acquisition.

Discussion

Based on the specifications of the self-assessment application, which contains a menu of self-assessment by students followed by re-assessment by the teacher, the sports practice videos produced by students will be by the rubric or grid given by the teacher. This is due to the teacher's re-checking students' self-assessments or triangulation. The application created can involve students to confirm the assignments they have made. This is part of the long-term goals in the educational process, where students play an active role in their assessment tasks (Topping, 2003).

This research includes triangulation of data sources (Sciberras & Dingli, 2023; Carter et al., 2014). So that the final value that appears on the final report menu is valid (Turner & Turner, 2009). This self-assessment from students and assessment from teachers reduces the risk of wrong assessment conclusions (Nasir & Sukmawati, 2023; Hammersley, 2009). Moreover, students may later rate too high, but the video provided does not match the assessment grid (rubric) that the teacher has provided.

Based on the Gtmetrix test results, the Nurul self-assessment application is in category B (Muriyatmoko & Aziz Musthafa, 2022). Grade B is not the highest grade, but it is considered good. The higher the grade, the better the performance of the website-based application (Armaini et al., 2022). We can see this from the application performance test results. FCP has a value of 1.6s, classified as "OK", but consider (Mahadika et al., 2023; Zamora et al., 2023). SI has a value of 2.2s, which is classified as "Longer than recommended" (Muriyatmoko & Aziz Musthafa, 2022). LCP has a value of 2.3s, classified as "Longer than recommended" (Manuaba, 2021). TTI scored 2.1, which is classified as "Good - nothing to do here" (Zamora et al., 2023; Safira & Jati, 2023). TBT has a value of 0ms, which is classified as "Good - nothing to do here" (Zamora et al., 2023). CLS has a value of 0, which is classified as "Good - nothing to do here" (Zamora et al., 2023).

In addition, based on the browse timings test, the app access time is less than 3 seconds. There are 4 out of 9 indicators of fast access of only a few milliseconds or less than 1 second. This shows that the self-assessment application can be accessed very quickly. This proves that the application's robustness and speed are getting higher (Dulaimi & Mashhadany, 2023).

The study emphasises the importance of the self-assessment application while recognising various

constraints. The use of triangulation as the sole method for data validation could potentially complicate the interpretation process. Furthermore, although the GTmetrix review provides valuable insights, it may not comprehensively capture the subtleties of the user experience. The application's performance, albeit satisfactory, might be enhanced with more optimisation. In addition, maintaining fast access in the face of growing user numbers necessitates continuous monitoring. Subsequent investigations could examine other validation techniques, augmenting quantitative data with qualitative observations. Furthermore, it is critical to make continuous improvements to enhance performance and adapt to user changing requirements in order to advance the effectiveness of self-assessment applications.

Conclusions

Website-based self-assessment applications can actively involve students in learning, especially assessment. Students' assessments of their assignments must be checked for correctness or validity with the teacher participating in assessing the student's assignments. This is called data source triangulation. Of course, it doesn't stop there; apart from data validity issues, the designed application must be tested for its durability and access speed. Gtmetrix is a tool that can test this. Gtmetrix provides results about the categories of applications that have been created, their performance, and browsing timings. Based on analysis of test data, it was found that the self-assessment application was in the "B" or Good category, performance was 79% or good, and access speed (browse timing) was very fast with an average of less than 3 seconds. These results show that students and teachers can use this website-based self-assessment application well without any significant problems in terms of durability performance and access speed.

References

- Armaini, I., Dar, M. H., & Bangun, B. (2022). Evaluation of Labuhanbatu Regency Government Website based on Performance Variables. *Sinkron*, 7(2), 760–766.
- Arni, S. A., Mongkau, D. C., & Berelaku, A. (2023). Analisis Performa Website Menggunakan GTMetrix. *Jurnal Minfo Polgan*, 12(1), 857–861.
- Ayubi, N., Kusnanik, N. W., Herawati, L., Komaini, A., & Cholik, T. (2022). Effects of Curcumin on Inflammatory Response During Exercise-Induced Muscle Damage (Literature Review). *Inflammation*, 27, 30.
- Bans-Akutey, A., & Tiimub, B. M. (2021). Triangulation in Research. *Academia Letters*, October.
- Bartuskova, A., Krejcar, O., Sabbah, T., & Selamat, A. (2016). Website speed testing analysis using speedtesting model. *Jurnal Teknologi*, 78(12–3), 121–134.
- Carter, N., Bryant-Lukosius, D., Dicenso, A., Blythe, J., & Neville, A. J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*, 41(5), 545–547.
- Dawis, A. M., & Setiawan, I. (2022). Evaluation of The Website 'Aisyiyah Surakarta of University Performance Based on Search Engine Optimization Using Automated Software Testing Gtmetrix. *International Journal of Computer and Information System (IJCIS)*, 3(1), 17–20.
- Dulaimi, abdullah al, & Mashhadany, shayma al. (2023). Quality and performance evaluation metrics of websites : a systematic literature review. *Technium: Romanian Journal of Applied Sciences and Technology*, 8, 84–99.
- Garett, R., Chiu, J., Zhang, L., & Young, S. D. (2017). Website Design and User Engagement. *Online J Commun Media Technol.*, 46(5), 1247–1262.
- Hardinata, R., Sastaman, P., Okilanda, A., Tjahyanto, T., Prabowo, T. A., Rozi, M. F., Suganda, M. A., & Suryadi, D. (2023). Analysis of the physical condition of soccer athletes through the yo-yo test: A survey study on preparation for the provincial sports week. *Retos: Nuevas Tendencias En Educación Física, Deporte y Recreación*, 50, 1091–1097.
- Heale, R., & Forbes, D. (2013). Understanding triangulation in research. *Evidence-Based Nursing*, 16(4), 98.
- Hearn, J., & McMillan, J. H. (2008). Student Self-Assessment: The Key to Stronger Student Motivation and Higher Achievement. *Educational Horizons*.
- Król, K. (2018). Comparative Analysis of the Performance of Selected Raster Map Viewers. *Geomatics, Landmanagement and Landscape (GLL)*, 2(2), 23–32.
- Kwangawad, A., Jattamart, A., & Nusawat, P. (2019). The Performance Evaluation of a Website using Automated Evaluation Tools. *TIMES-iCON 2019 - 2019 4th Technology Innovation Management and Engineering Science International Conference*, December 2019.
- Kiram, Y., Yenes, R., Komaini, A., Ihsan, N., & Mario, D. T. (2023). Effect of weight training and motor skills on muscle strength: A factorial experimental design. *Journal of Physical Education and Sport*, 23(6), 1416–1424.
- Komaini, A., Kiram, Y., Mario, D. T., & Handayani, S. G. (2023). Fundamental Movement Skills in Children in Mentawai Islands: Indigenous Tribes in Indonesia. *Physical Education Theory and Methodology*, 23(4), 520–530.
- Lestari, W., & Susanto, A. (2017). Analisis Performa Website ISI Surakarta dan Universitas Diponegoro Menggunakan Automated Software Testing GTmetrix. *Simkom*, 2(3), 1–8.
- Mahadika, D. A., Aristyagama, Y. H., & Budiyanto, C. W. (2023). Evaluation of Website Based Information System To Monitor Student Learning Progress In Schools Using ISO/IEC 9126 Standards And GTMetrix. *IJIE (Indonesian Journal of Informatics Education)*, 7(1), 42.
- Manjunatha.N. (2019). Descriptive research. *Journal of*

- Emerging Technologies and Innovative Research, 6(6), 863–867.
- Manuaba, I. B. K. (2021). Performance Comparison of Text Based Game Prototypes Using GTmetrix. *Journal of Games, Game Art, and Gamification*, 6(1), 1–6.
- Mukarromah, U., & Wijayanti, W. (2021). Implementation of the online learning at vocational high school during Covid-19: Between obligations and barriers. *Jurnal Pendidikan Vokasi*, 11(1), 92–101.
- Muriyatmoko, D., & Aziz Musthafa. (2022). Website Performance Testing Using Speed Testing Model: A Case of Reputable Indonesian Journals. *Teknik: Jurnal Ilmu Teknik Dan Informatika*, 2(1), 40–45.
- Nasir, N., & Sukmawati, S. (2023). Analysis of Research Data Quantitative and Qualitative. *Edumaspul: Jurnal Pendidikan*, 7(1), 368–373.
- Neldi, H., Nasriah, A. K., Mario, D. T., Umar, A., & Rasyid, W. (2023). Physical and psychological conditions in kayaking: Strength, flexibility, and motivation. <https://rua.ua.es/dspace/handle/10045/137960>
- Nelson, S., Kurniawan, H., Bakhtiar, S., Komaini, A., & Lesmana, K. Y. P. (2023). Karate in the digital age: Augmented reality for enhanced learning and performance. *Journal of Physical Education and Sport*, 23(12), 3235–3245.
- Nofita Sari, S., Juliantari Dewi, D. M. T., & Diah Utari Dewi, N. (2022). The Analysis of Quality Information on The Website of South Bengkulu, Bengkulu Province. *Iapa Proceedings Conference*, 3, 110.
- Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. *Anatolian Journal of Education*, 4(2), 53–60.
- Rawashdeh, A. Z. Al, Mohammed, E. Y., Arab, A. R. Al, Alara, M., & Al-Rawashdeh, B. (2021). Advantages and disadvantages of using E-learning in university education: Analyzing students' perspectives. *Electronic Journal of e-Learning*, 19(2), 107–117.
- Safira, R. E., & Jati, H. (2023). Analysis And Development Of Project Monitoring Information Systems Using Restful Api Echo Framework At SMK Negeri 2 Klaten. *Journal of Information Technology and Education (JITED)*, 1(1), 19–32.
- Sciberras, M., & Dingli, A. (2023). Research Analysis — Triangulation Approach. *Investigating AI Readiness in the Maltese Public Administration*, 568, 31–32.
- Sciberras, M., Dingli, A. (2023). Research Analysis— Triangulation Approach. In: *Investigating AI Readiness in the Maltese Public Administration. Lecture Notes in Networks and Systems*, vol 568. Springer, Cham.
- Tengriano, H. A., Yunus, A., & Sudirman. (2022). Performance Analysis of Website AyoMulai Using GTMetrix and Page Speed Insights. *Jurnal Ilmu Komputer*, 17(02), 199–213.
- Topping, K. (2003). Self and Peer Assessment in School and University: Reliability, Validity and Utility. *Optimising New Modes of Assessment: In Search of Qualities and Standards*, 55–87.
- Turner, P., & Turner, S. (2009). Triangulation in practice. *Virtual Reality*, 13(3), 171–181.
- Welling, R. W., & White, L. W. (2006). Web site performance measurement: Promise and reality. *Managing Service Quality*, 16(6), 654–670.
- Wijaya, B. S. (2015). From Selection to Proposition: Qualitative Data Analysis Models and Methods. *Journal Communication Spectrum*, 5(1), 1-12.
- Yudi, A. A., Sari, S. N., Arifan, I., Firdaus, F., Suganda, M. A., Suryadi, D., Prabowo, T. A., Yati, Y., Paramitha, S. T., & Aryadi, D. (2024). How can Small Sided Game training methods (3 vs 3 and 6 vs 6) and VO2max affect basic soccer skills? *Retos: Nuevas Tendencias En Educación Física, Deporte y Recreación*, 52, 550–557.
- Zamora, K. P., Moran, J. C., Cabrera, D. M., & Mendoza, S. P. (2023). Measurement on University Websites: A Perspective of Effectiveness. *International Journal On Informatics Visualization*, 7(3), 1995–2006.

Datos de los/as autores/as:

Nurul Ihsan	nurul_ihsan@fik.unp.ac.id	Autor/a
Ardo Okilanda	ardo.oku@fik.unp.ac.id	Autor/a
Saddam Al Aziz	saddamalaziz@fmipa.unp.ac.id	Autor/a
Zainal Abidin Nazaruddin	zainalabidin@utm.my	Autor/a
Diyana Zulaika	diyana@utm.my	Autor/a
Delta Rahwanda	rahwanda_delta@yahoo.com	Traductor/a