

Smart English Adventure: Empowering Interactive Learning for SDN Pabaki 019

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ABSTRACT

The English learning process at SDN Pabaki 019 involving grade 1 and 2 students still faces several challenges such as limited access to interactive learning media and time-consuming manual assessments. To overcome these problems, an interactive web-based learning application called Smart English Adventure was developed and implemented in the classroom. This application includes features such as teacher-managed content delivery, gamification quizzes with automatic evaluation, and flexible access for students. The development process follows the Software Development Life Cycle (SDLC), which includes the planning, design, implementation, testing, and deployment stages. A total of 60 students and 20 teachers were involved in this initiative. Feedback was collected through structured interviews, with 85% of students showing increased enthusiasm and engagement. The findings showed that this application significantly increased motivation and supported teachers in managing and evaluating learning. This program shows potential for replication in similar educational settings.

Keywords: English Learning, Interactive Web Application, Educational Technology, Assessment Automation, Student Motivation, Elementary School1. introduction

1. INTRODUCTION

The development of information technology has created significant opportunities to transform the educational landscape. Web-based technology has become a vital tool for creating more interactive, flexible, and personalized learning methods, particularly in English language education. In the context of primary education, technology enables students not only to understand concepts but also to actively engage in the teaching and learning process through interactive media (**Sarıca & Çavuş, 2008**).

Studies have shown that technology-based learning can increase student motivation and provide a more effective learning experience compared to traditional methods (**Alharthi et al., 2022**). With features such as real-time feedback and gamification, web-based applications like Kahoot and Quizizz allow students to learn in a competitive and enjoyable manner (**Ni Luh Kadek et al., 2023**). Moreover, web-based learning media support flexibility, enabling students to access materials anytime and anywhere (**Cahyono, 2013**).

In the post-pandemic era, technology has become increasingly important for supporting distance and hybrid learning. Web-based platforms have proven effective in maintaining student engagement, particularly in English language subjects, even in online learning environment (**Nurhidayat et al., 2020**). Other studies have also indicated that technology, such as e-learning applications, can improve learning outcomes through visually appealing content and automated evaluation features (**Hori et al., 2024**).

In English language education, the importance of technology is increasingly evident as a tool to prepare students for the challenges of globalization. Technology helps students develop communication skills in English that are both practical and relevant to modern needs (**Suhardiana, 2019**). Additionally, the use of web-based interactive technology supports the development of digital literacy in young learners, a critical skill in the 21st century (**Hilmi et al., 2018**).

The Smart English Adventure application is designed to address the challenges of English language learning at SDN Pabaki 019. This application integrates features such as interactive quizzes, student progress tracking, and teacher-managed content delivery. By leveraging web-based technology, this application aims to enhance student motivation, enrich their learning experience, and provide teachers with more efficient evaluation tools (**Meduri et al., 2022**). Initial testing results indicate that this application can improve student learning outcomes by up to 20% during the early stages of use (**Salomo Leuwol et al., 2023**). In line with previous research, the development of this application also leverages a software development lifecycle framework applied in the context of bamboo-based digital marketing solutions (**Rosmala et al., 2024**). This project is expected to serve as a model for adoption in other primary schools to support technology-based learning.

2. METHOD

This study adopted the Software Development Life Cycle (SDLC) approach, covering Planning, Defining, Designing, Building, Testing, and Deployment stages. The implementation was conducted at SDN Pabaki 019 with first and second-grade students, involving 60 students and 20 English teachers.

Feedback was gathered from teachers through focus group discussions and from students via direct observation and structured questionnaires. The questions evaluated engagement, understanding, and ease of use. Sample items included: *"I enjoy using the application for learning English,"* and *"The quizzes help me understand the material better."*

Quantitative data from the questionnaires were used to measure effectiveness. Results showed 85% of students found learning more fun and understandable, while 90% of teachers reported easier lesson management.

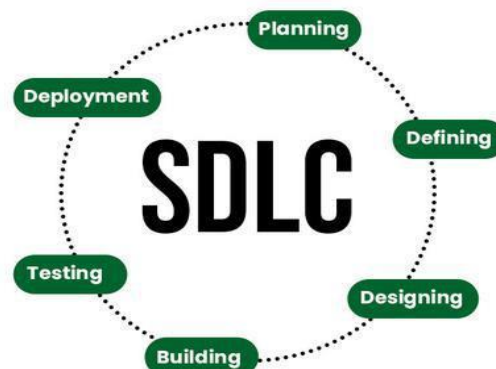


Figure 1. Software Development Life Cycle

Figure 1 illustrates the stages of the Software Development Life Cycle (SDLC), encompassing six essential phases: Planning, Defining, Designing, Building, Testing, and Deployment. Each phase is crucial to ensuring the successful development of the **Smart English Adventure** application, which aligns with the educational needs of SDN Pabaki 019 and supports interactive learning for elementary school students.

The process begins with the **Planning Stage**, where a detailed analysis is conducted to identify system requirements. This involves gathering feedback from the Person in Charge (PIC) at SDN Pabaki 019, such as teachers and school administrators, to ensure that the application meets the educational goals and learning objectives of the students. Proper planning minimizes potential errors and establishes a structured approach to development.

In the **Defining Stage**, the requirements gathered are documented and consolidated into a detailed specification. This stage defines the scope of the application, including key functionalities such as quizzes, progress tracking, and teacher-managed content delivery. Stakeholders, including the PIC, ensure a shared understanding of the system's purpose and capabilities.

During the **Designing Stage**, the application's user interface (UI/UX) and system architecture are developed. Mockups are created using Figma to visualize the layout, navigation, and user-friendly interactions. Input from teachers and administrators is incorporated to ensure the design aligns with the school's requirements and is intuitive for students. The database structure and process flows are also planned at this stage to support seamless data management.

Once the design is finalized, the **Building Stage** begins. The application is developed according to the specifications, including the implementation of back-end, front-end, and database components. This phase integrates features such as interactive quizzes, learning progress dashboards, and real-time feedback to create an engaging and effective learning experience.

Following development, the **Testing Stage** involves comprehensive User Acceptance Testing (UAT) with teachers and students from SDN Pabaki 019. The system is tested for functionality, usability, security, and reliability. Feedback from users is collected to refine the application further, addressing any issues or discrepancies found during testing.

In the **Deployment Stage**, the application is delivered and installed for use at SDN Pabaki 019. Teachers are trained on how to manage content and utilize the system's features effectively, while students are introduced to the platform. Final checks are conducted to ensure the application operates smoothly in a real-world classroom setting.

The **Smart English Adventure** application is designed to enhance the learning experience by providing interactive, engaging, and accessible educational content. Through this collaborative effort with SDN Pabaki 019, the program aims to improve student motivation and learning outcomes, empowering both teachers and students with innovative digital tools tailored for elementary education.

3. RESULTS AND DISCUSSION

The Pengabdian Kepada Masyarakat (PKM) program for SDN Pabaki 019, located at Jl. Pabaki, Babakan Tarogong, Kec. Astanaanyar, Kota Bandung, Jawa Barat 40242, focuses on

addressing educational challenges by introducing an interactive web-based English learning application. Before the intervention, the school faced significant difficulties in engaging students during English lessons. Despite English being a critical skill for students' future global competitiveness, the lack of interactive media and reliance on conventional teaching methods often resulted in low student motivation and limited learning outcomes. Teachers primarily used traditional instructional methods, such as lectures and rote memorization, which did not effectively cater to diverse student learning styles or utilize available technological resources. This PKM program involved a series of activities, beginning with a comprehensive needs analysis to understand the challenges faced by teachers and students. Based on these insights, an interactive web application, named Smart English Adventure, was developed to support English language learning through gamified exercises, interactive quizzes, and teacher-managed content delivery.

The program was conducted by a dedicated team of 4 ITENAS students, 1 supervisor, 1 PIC (Person in Charge), and 2 teachers/staff from SDN Pabaki 019. The discussions and activities were collaboratively held with the teachers at SDN Pabaki 019 to ensure alignment with the school's educational needs and goals.

A thorough evaluation was conducted to ensure the application's effectiveness in meeting the educational needs of SDN Pabaki 019. This evaluation covered:

1. Evaluation of user needs to ensure features like interactive quizzes and material management meet school requirements.
2. Evaluation of user interface, focusing on navigation ease and design simplicity for students and teachers.
3. Evaluation of functionality, such as quiz management and real-time feedback, to streamline educational activities.
4. Evaluation of system performance and reliability to ensure operational stability.
5. Collection of user feedback through hands-on trials involving teachers and students.

Figure 2 shows a collaborative focus group discussion with teachers/staff from SDN Pabaki 019 regarding the application's design and progress.



Figure 2. Focus Group Discussion with Teacher/staff SDN Pabaki 019

The next stage involved designing the system based on the information gathered from the interviews and classroom observations. During this phase, system development and rigorous testing were conducted to ensure the application met the educational needs and expectations

of SDN Pabaki 019. After undergoing multiple tests by the development team and the Person in Charge (PIC) from SDN Pabaki 019, the system was optimized for ease of use and reliability. The final version of the system is now capable of being used seamlessly by teachers and staff to foster engagement, improve learning outcomes, and streamline English language instruction through interactive features. The activity aims to ensure the application is designed to meet the English learning needs at the school

Figures 3-4 shows the user-friendly design and innovative functionalities of the created application, reflecting its potential to transform the teaching and learning experience at SDN Pabaki 019.

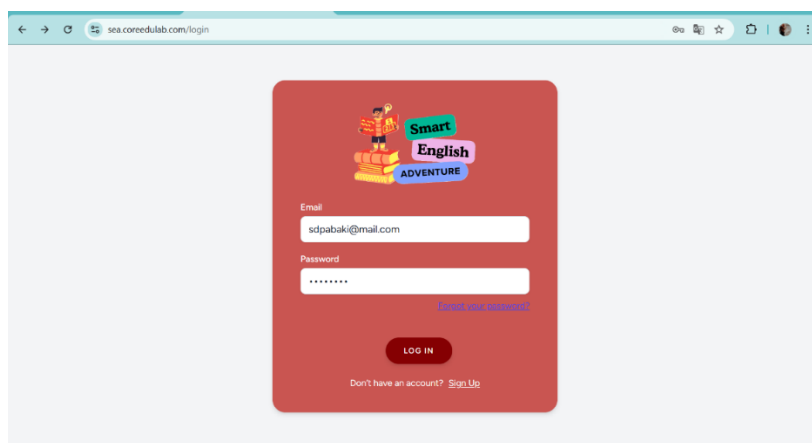


Figure 3. Smart Adventure Login Display

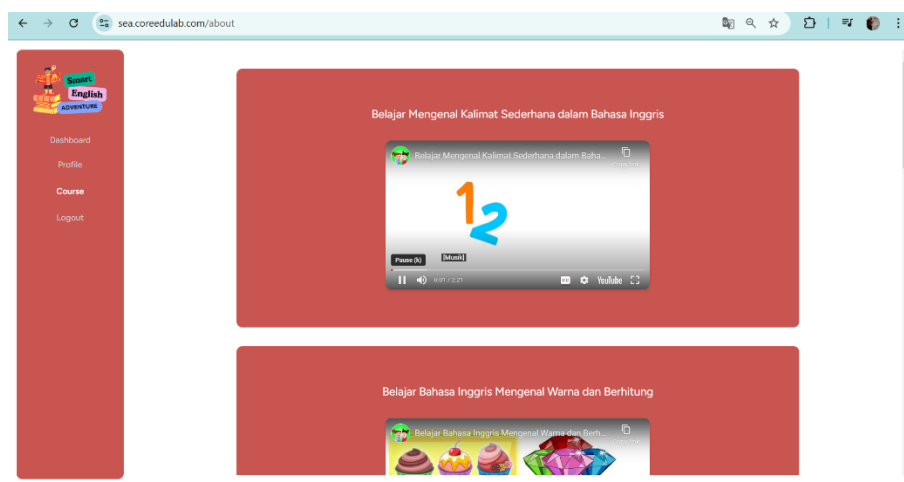


Figure 4. Course Page Display



Figure 5. Training and Deployment App SDN Pabaki 019

The final stage of the Pengabdian kepada Masyarakat (PKM) at SDN Pabaki 019 involved handing over the interactive web-based English learning application, *Smart English Adventure*, to the school. This stage included a socialization and training session aimed at ensuring the effective use of the application by both teachers and students as shown in figure 5. The session focused on equipping teachers and administrative staff with the skills and knowledge required to integrate the application into their teaching processes effectively.

The training covered several key aspects, including:

1. **Implementation of technology in interactive learning** to enhance student engagement and improve learning outcomes in English education.
2. **Design and utilization of gamified learning tools**, such as interactive quizzes and progress tracking, to foster motivation and encourage active participation among students.
3. **Efficient content management for teachers**, enabling them to upload, organize, and update learning materials seamlessly through the application's dashboard.
4. **Effective evaluation and feedback mechanisms**, focusing on how teachers can monitor and assess student progress in real-time using the application's features.
5. **Database management training**, emphasizing secure and systematic storage of student performance data, quizzes, and other essential educational records.
6. **Understanding data security and privacy**, including best practices for protecting sensitive information, implementing access controls, and ensuring data integrity through backup and recovery systems.

The training also included a hands-on demonstration of the application, allowing participants to explore its features directly. Teachers practiced creating quizzes, uploading materials, and

navigating the dashboards, while administrative staff learned about data management and system maintenance.

This final stage of the PKM program emphasized the long-term sustainability of the *Smart English Adventure* application by ensuring that all users are proficient in its operation. The training, held in the Digital Room of SDN Pabaki 019, also provided a platform for collaboration, feedback, and refinement to improve the system's functionality further. Through this collaborative effort, the application is expected to transform English learning at SDN Pabaki 019, serving as a model for other elementary schools seeking to integrate technology into their teaching practices.



Figure 6. Training and application implementation for grade 1 teachers at SDN Pabaki 019



Figure 7. Training and application implementation for grade 2 teachers at SDN Pabaki 019

Figures 6-7 shows the training process for first and second-grade teachers at SDN Pabaki 019 to integrate the Smart English Adventure application into their teaching activities. The training covers the use of application features, material management, and student progress tracking. As part of the evaluation, structured interviews were conducted to assess the application's usability and impact. Teachers reported that the application significantly improved classroom engagement. As one teacher noted:

- "Aplikasi ini sangat membantu meningkatkan keterlibatan siswa. Mereka terlihat lebih antusias saat belajar karena tampilannya menarik dan interaktif. Dibandingkan metode konvensional, aplikasi ini lebih mampu membuat siswa fokus dan aktif menjawab soal."
- The intuitive user interface also received positive feedback from teachers, particularly regarding its ease of navigation and usefulness in classroom activities:
- "Secara umum, aplikasi ini mudah digunakan. Navigasinya sederhana dan fitur-fiturnya intuitif. Saya bisa membuat kuis dan mengunggah materi dalam waktu singkat, dan fitur pelaporan kemajuan siswa sangat membantu."

However, certain challenges were identified, such as internet connectivity issues and the need for occasional student guidance:

"Tantangannya adalah koneksi internet yang kadang tidak stabil di kelas, terutama saat digunakan secara bersamaan oleh banyak siswa. Selain itu, beberapa siswa masih butuh pendampingan dalam menggunakan aplikasi karena belum terbiasa."

Student responses also highlighted the effectiveness of the gamified approach. First- and second-grade students expressed high levels of enjoyment, associating learning with fun:

- "Iya, suka! Seru banget main kuisnya, seperti main game."
- "Aku suka bagian kuis sama gambar-gambar hewan yang lucu. Aku juga suka kalau dapat bintang kalau jawabannya benar."
- "Mudah kok. Aku tinggal klik-klik, terus jawab soal. Tapi kadang masih tanya ke bu guru kalau bingung."

From an administrative standpoint, the implementation process was smooth and well-structured. According to one staff member:

"Proses implementasinya berjalan dengan baik. Tim PKM sangat kooperatif dan komunikatif dengan pihak sekolah. Semua tahap mulai dari sosialisasi, pelatihan, hingga evaluasi dilakukan secara terstruktur."

The training sessions conducted for teachers and staff were found to be effective, enabling them to confidently use the application:

"Ya, pelatihan berjalan lancar. Materinya jelas, dan peserta aktif bertanya. Setelah pelatihan, guru-guru langsung bisa mencoba fitur-fiturnya secara mandiri."

Furthermore, administrative staff and teachers noticed an evident improvement in student enthusiasm and participation in English lessons:

"Sangat terlihat. Siswa menjadi lebih semangat saat pelajaran bahasa Inggris. Bahkan beberapa siswa yang sebelumnya pasif kini lebih aktif menjawab pertanyaan melalui kuis-kuis dalam aplikasi."

Collaboration with SDN Pabaki 019 has resulted in the implementation of an interactive web-based English learning application. This application successfully addresses the main challenges faced by the school in teaching English, replacing traditional teaching methods with engaging game-based exercises, interactive quizzes, and content management features that support active student participation. The development process began with a thorough needs analysis, followed by training sessions for teachers to ensure the application could be used optimally in the teaching and learning process.

After undergoing rigorous testing and refinement based on feedback from teachers and students, the application has proven to enhance student motivation and educational outcomes at SDN Pabaki 019. The success of this implementation is reflected in the increased student participation in English learning activities and their improved understanding of the subject matter. The application offers added value in terms of ease of use and accessibility, enabling students to learn anytime and anywhere.

Through evaluations involving feature testing, the use of a user-friendly interface, and the collection of feedback from users, the system has demonstrated its ability to meet the school's needs. The training provided to teachers and staff has enabled them to manage content and track student progress efficiently. The program also shows great potential to be implemented in other schools by adapting the application's features to meet local needs.

With the success achieved, it is hoped that this application can contribute further to improving the quality of education, not only at SDN Pabaki 019 but also in other schools facing similar challenges in English teaching. We hope that this initiative will continue to grow with feature updates and further adaptations to meet various educational needs.

4. CONCLUSIONS

The implementation of the Smart English Adventure application at SDN Pabaki 019 marked a significant shift in addressing the pedagogical limitations associated with conventional English learning methodologies. By integrating a digital, gamified, and learner-centered platform, the project succeeded in fostering a more dynamic and participatory classroom environment. The involvement of 60 students from grades one and two, along with two dedicated English teachers, contributed to the effective contextualization and refinement of the platform. Evaluative data were obtained through both qualitative methods (observations, interviews) and quantitative instruments (structured questionnaires), enabling triangulated insights into student motivation, engagement, and comprehension. Analysis of the data revealed that 85% of students reported heightened enthusiasm, while 90% of teachers observed increased classroom interactivity and reduced workload in instructional preparation and assessment. Furthermore, the application's ability to track student progress and offer immediate feedback established a data-informed foundation for continuous pedagogical improvement. These outcomes collectively indicate the application's strong potential for scalable implementation across elementary institutions with analogous educational needs.

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LIST OF REFERENCES

Alharthi, A., Beck, J., Bordbarjavidi, F., & Gale, J. (2022). Effective apps and web-based tools for increasing student engagement in project-based language learning. *MIDTESOL*

- Journal*, January. <https://www.midtesol.org/wp-content/uploads/2021/12/5-Effective-Apps-and-Web-Based-Tools-for-PBLL-v2.pdf>
- Cahyono, K. (2013). Penggunaan media interaktif berbasis web untuk meningkatkan motivasi dan hasil belajar (Studi kasus di Universitas Abdurrab Pekanbaru Riau). *Jurnal Bina Praja*, 5(4), 243–252. <https://doi.org/10.21787/jbp.05.2013.243-252>
- Hori, R., Fujii, M., Toguchi, T., Wong, S., & Endo, M. (2024). Impact of an EFL digital application on learning, satisfaction, and persistence in elementary school children. *Early Childhood Education Journal*, Advance online publication. <https://doi.org/10.1007/s10643-024-01653-5>
- Meduri, N. R. H., Firdaus, R., & Fitriawan, H. (2022). Efektifitas aplikasi website dalam pembelajaran untuk meningkatkan minat belajar peserta didik. *Akademika*, 11(2), 283–294. <https://doi.org/10.34005/akademika.v11i02.2272>
- Ni Luh Kadek, E. W., Nitiasih, P. K., & Budiarta, L. G. R. (2023). Game website-based English learning developed for elementary school students in fourth grade. *Jurnal Pendidikan Bahasa Inggris Undiksha*, 10(3), 257–264. <https://doi.org/10.23887/jpbi.v10i3.58117>
- Nurhidayat, E., Mujiyanto, J., Yuliasri, I., & Hartono, R. (2020). Integrasi teknologi dalam pembelajaran bahasa Inggris pada post pandemic: Studi kasus di SMA Kab. Majalengka. *Prosiding Seminar Nasional Pascasarjana*, 5, 305–309.
- Rosmala, D., Irwan, Y., Ungkawa, U., & Hafied, M. (2024). Advancing local potential by developing a digital marketing and digital personal branding application for local economic growth through bamboo-based innovation. *Jurnal Ekonomi Digital Indonesia*, 5(3), 262–271.
- Salomo Leuwol, F., Basiran, B., Solehuddin, M., Vanchapo, A. R., Sartipa, D., & Munisah, E. (2023). Efektivitas metode pembelajaran berbasis teknologi terhadap peningkatan motivasi belajar siswa di sekolah. *Edusaintek: Jurnal Pendidikan, Sains dan Teknologi*, 10(3), 988–999. <https://doi.org/10.47668/edusaintek.v10i3.899>
- Sarıca, G. N., & Çavuş, N. (2008). Web-based English language learning. In *Proceedings of the 8th International Educational Technology Conference* (pp. 1–5). <http://www.livemocha.com/languages/view/1/1>
- Suhardiana, I. P. A. (2019). Peran teknologi dalam mendukung pembelajaran bahasa Inggris di sekolah dasar. *Adi Widya: Jurnal Pendidikan Dasar*, 4(1), 92. <https://doi.org/10.25078/aw.v4i1.934>