EDUNITE : Connecting Communities for Accessible, Inclusive,and Sustainable Primary Education Through Collaborative Digital Innovation

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Abstract
Equitable access to basic education remains a challenge in developing countries, particularly in rural and remote areas with limited infrastructure and economic constraints that hinder students' participation in supplementary learning. This study aims to address these challenges by developing Edunite, a community- based, free tutoring application designed to improve access to quality education for elementary students from low-income families in Batu City, Indonesia. Employing a Research and Development (R&D) approach with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation), the research involved needs analysis through observation and interviews in two sub-districts, Bumiaji and Junrejo, to identify barriers such as insufficient parental support and school funding. The Edunite application was collaboratively designed to facilitate digital learning, volunteer training, and donor involvement, with features tailored to local needs and infrastructure. Findings indicate that digitalization and community collaboration enhance student engagement, motivation, and learning outcomes, while also fostering an inclusive educational environment. The study concludes that the Edunite application, supported by effective policy, technology infrastructure, and volunteer training, can significantly improve access to supplementary education and contribute to achieving Sustainable Development Goals in education and social equity. Edunite serves as a replicable model for other regions facing similar educational challenges

1. Introduction

Equitable access to basic education remains a challenge in many developing countries, especially in rural and remote areas that face limited infrastructure and educational facilities (Aikins & Koranteng, 2020). In addition, economic factors such as poverty are also a major barrier, with many families unable to afford education, leading to high dropout rates (Bray, 2022).

To overcome these challenges, innovative and collaborative initiatives are needed. This idea describes free tutoring programs supported by communities, non-governmental organizations and volunteers that have been proven effective in increasing access to basic education and building social awareness in communities (Bray, 2022). Thus, facilitating access to basic education through free tutoring programs is an important step to ensure that every child has the opportunity to reach their full potential, regardless of their economic background.

International scholarly research consistently highlights the global need for equitable access to private tutoring, especially among socio-economically disadvantaged students. Bray (2022) reported that in multiple Asian and African countries, between 60–80% of students engage in some form of private tutoring, often referred to as "shadow education," due to limited formal school effectiveness. In a comparative analysis, Aikins and Koranteng (2020) emphasized that in Egypt, over 58% of secondary students rely on private tutoring, and families allocate up to 61% of their educational budget to it—creating a burden for low-income households. Marinescu and Tănase (2022), analyzing data from Romanian schools during the COVID-19 pandemic, found that over 75% of students sought external academic support, mainly for high-stakes examinations, reinforcing the widespread dependency on supplementary education. These studies not only document high demand, but also reveal structural inequality: students from higher-income families consistently access higher-quality tutoring. In response, several researchers advocate for policy-driven, community-based, and technology-enabled interventions to democratize access. Thus, platforms like Edunite, designed as

cost-free and collaborative, are aligned with international academic consensus on reducing educational disparities through inclusive, locally contextualized solutions.

While international and national studies have clearly identified gaps in educational access, particularly among low-income families, there is still a need for localized data to support the development of targeted solutions. Therefore, this study adopts a Research and Development (R&D) method based on the ADDIE model, but is limited to the Analysis and Design phases only. This limitation is due to time and resource constraints, and follows the approach of similar prior research (Ridhuan & Rabihah, 2020; Spatioti et al., 2022). The insights gained from this initial stage are expected to inform future development, testing, and implementation stages.

To ensure that the development of the Edunite application is grounded in actual educational challenges, a needs analysis was conducted during the preliminary phase. This analysis included interviews and observations in Bumiaji and Junrejo sub-districts, revealing barriers such as limited financial support from parents, lack of structured tutoring programs, and unequal access to digital learning tools. Although a formal questionnaire was not distributed, this research draws upon validated instruments from prior studies in similar educational contexts (Ridhuan & Rabihah, 2020; Gudu & Ochieng, 2022). Their findings emphasize that effective instructional design must be rooted in a systematic understanding of learners' environments and constraints. These data guided the formulation of the Edunite app's features, ensuring they address real-world conditions and learners' urgent needs.

This idea comes from an innovative activity that the author has participated in, namely being one of the volunteers teaching the science village, according to the information obtained from the facilitator of the science village who said that the activity experienced several obstacles, one of which was the lack of good management so that the program has not been re-run until now, it is unfortunate because the program was warmly welcomed by students and parents in Sumber Brantas village, Batu City, therefore in this idea the author provides innovation from application development

2. Method

Although the R&D method employed in this study uses the full ADDIE model, the present research is limited to the Analysis and Design phases only. This limitation is intentional, due to time and resource constraints, and follows previous studies that emphasize the importance of focusing on needs analysis and prototype design before proceeding to development and implementation (Spatioti et al., 2022; Zhang et al., 2022). As argued by Cahyani et al. (2020), conducting an in-depth design process is crucial in ensuring that the final product aligns with user expectations and contextual feasibility. Therefore, the Edunite application is currently in the conceptual-prototype phase, awaiting future trials and further testing.

This The research method used in developing this community-based free tutoring program application is Research and Development (R&D). The Research and Development (R&D) research method used in the development of Edunite applications follows a systematic approach to produce effective and applicable educational innovations. The ADDIE model-Analysis, Design, Development, Implementation, and Evaluation-remains the most widely used framework in the development of digital education technology today (Cahyani et al., 2020; Spatioti, Kazanidis, & Pange, 2022). In the analysis stage, researchers identified educational challenges such as limited access, the need for flexible learning, and strengthening life skills through observation, interviews, and literature review. In the design stage, the features of the Edunite app were designed to be collaborative and easily accessible to students, volunteers and donors, and a prototype was created to suit local needs. The development stage emphasized adapting the app to real conditions and periodic review to ensure product quality (Spatioti et al., 2022).

Implementation is done through community trials, application promotion, and engagement with various parties. Evaluation involves collecting feedback from users to improve and develop the app continuously. Recent research confirms that the ADDIE model is very effective in the development of educational digital products because it emphasizes continuous evaluation and revision so that the resulting innovations truly meet user needs (Spatioti et al., 2022; Zhang et al., 2022). Collaboration in digital education has been shown to improve student motivation, engagement and learning outcomes (García-Holgado et al., 2020; Zhang et al., 2022). Digitizing

learning expands access, enriches learning experiences, and builds social connections between students and volunteers (Zhu & Wang, 2023). In addition, training volunteers and teachers in the use of technology is the key to successful implementation of digital-based educational applications (Zhu & Wang, 2023).Thus, the R&D method applied to the development of the Edunite app is not only oriented towards product creation, but also ensures that each stage is based on data, involves various stakeholders, and is always evaluated for continuous improvement. This is in line with recent international research results that emphasize that R&D is a highly relevant method for producing adaptive and impactful educational innovations (Spatioti et al., 2022; Zhang et al., 2022).

Although this study adopts the Research and Development (R&D) method using the ADDIE model, it is important to emphasize that the current research is situated in the preliminary stages, specifically the Analysis and Design phases. Therefore, references to the application's features and operations are part of the conceptual design and should not be interpreted as outcomes of implementation or empirical validation. To ensure clarity, the proposed application remains at the prototype development level, and all findings presented are derived from conceptual analysis and contextual observations rather than experimental testing.

To inform the design phase with relevant field data, the study incorporated qualitative inputs through interviews and observations conducted in two sub-districts of Batu City, as well as a limited structured questionnaire involving five elementary school teachers and five parents. These preliminary findings revealed key challenges such as the absence of structured tutoring programs, limited access to digital learning resources, and high community interest in collaborative educational models. While these data points are not comprehensive, they provide an initial empirical foundation for feature formulation and system design. Future stages of the research will include a broader sample, systematic usability testing, and effectiveness evaluation to validate the application's practical impact and scalability.

3. Results and Discussion

They should be combined. The study results should be clear and concise. Restrict the use of tables and figures to depict data that is essential to the message and interpretation of the study. The results should be presented in a logical sequence in the text, tables and illustrations. The part of result exposes the findings obtained from research data which is related to the hypotheses. The results should summarize (scientific) findings rather than providing data in great detail. The discussion should explore the significance of the results of the work. Explains the findings obtained from research data along with theory and similar research comparison. Make the discussion corresponding to the results, but do not reiterate the results. The following components should be covered in discussion: How do your results relate to the original question or objectives outlined in the Introduction section (what/how)? Do you provide interpretation scientifically for each of your results or findings presented (why)? Are your results consistent with what other investigators have reported (what else)? Or are there any differences?. Include in the discussion the implications of the findings and their limitations, how the findings fit into the context of other relevant work, and directions for future research.

Based on the findings above, the author can develop an innovative idea as a solution.

1. Identification of Environmental Potential and Needs
   1.1 Environmental Potential
      1.1.1 Digitization of Learning

      Digitalization of Learning not only enriches students' learning experience, but also allows them to access subject matter anytime and anywhere complemented by life skills learning. This facility allows students to get immediate help when they face difficulties in understanding the subject matter. This interaction not only improves academic understanding but also builds important social relationships between students and volunteers.

      1.1.2 Collaborative Feature

      Training for volunteers is required so that they can use apps and technology in learning. Mentors' readiness in information technology is

also critical to the success of the Edunite program. The training aims to provide volunteers with skills to manage effective learning, such as drafting syllabi and uploading teaching materials. Volunteers are taught to use digital tools to design creative learning materials. With the right training, volunteers will be more confident and able to create an engaging learning environment. Investing in volunteer training is a strategic step for the success of Edunite and positive for education in Indonesia.

1.1.3 Accessibility for Primary School Students in Need of Economically Constrained Learning Support

Edunite is designed to help children who need learning support and cannot afford it to study additionally. By providing this support, Edunite has the potential to increase student engagement, encouraging them to more actively participate in classroom learning activities. An inclusive learning environment is created, where all students, regardless of their economic background, have an equal opportunity to receive a quality education complemented by learning life skills for students to utilize in their daily lives.

1.2 Environmental Needs

1.2.1 Technology Infrastructure

For effective use of Edunite, good technology infrastructure is required, such as stable internet access and devices such as computers or tablets. This is important because Edunite requires online connectivity for learning content. Without good access, students will have difficulty learning. However, Edunite also provides periodic face-to-face learning with the help of volunteers, allowing for a more interactive and immersive learning experience, as well as the opportunity to interact directly with teachers and peers.

1.2.2 Awareness and Importance of Collaboration

People need to realize the importance of collaboration in education, both between students, donors, and volunteers. This collaboration not only strengthens the traditional education structure but also creates an inclusive and dynamic learning environment. Collaboration between stakeholders in education can create a more holistic learning experience that is relevant to the needs of society and the evolving world of work (Watkins & Donnelly, 2021).

1.2.3 Supportive Education Policies

Local government and educational institution policies are essential to support Edunite applications. Policies that support education digitization and inclusion will help all students, including those in remote areas, access quality learning resources. Collaboration between central and local governments is needed for a thorough implementation, including the improvement of technology infrastructure in schools and training for teachers. These measures aim to improve access and quality of education across Indonesia.

1.2.4 International Development Implications.

Although this study was conducted within the local context of Batu City, Indonesia, the collaborative and digital-based approach of the Edunite application presents strong potential for international adaptation, particularly in developing countries facing similar challenges. Studies by Bray (2022) and Marinescu and Tănase (2022) have shown that issues of

educational inequality, limited access to quality tutoring, and reliance on informal educational support are prevalent in various regions across Asia and Africa. In this regard, Edunite's open-access, community-driven, and flexible learning model can serve as a globally relevant framework. While the innovation originates from the author's experience as a volunteer educator in Indonesia, the core principles—community engagement, digital accessibility, and inclusive design—align with international best practices and could be customized for use in other low-resource settings. This potential also supports the broader goals of Sustainable Development Goals (SDGs), particularly Goal 4 (Quality Education), Goal 10 (Reduced Inequalities), and Goal 17 (Partnerships for the Goals).

1.2.5 Volunteer Training

Training for volunteers is required so that they can use apps and technology in learning. Mentors' readiness in information technology is also critical to the success of the Edunite program. The training aims to provide volunteers with skills to manage effective learning, such as drafting syllabi and uploading teaching materials. Volunteers are taught to use digital tools to design creative learning materials. With the right training, volunteers will be more confident and able to create an engaging learning environment. Investing in volunteer training is a strategic step for the success of Edunite and positive for education in Indonesia.

2. Formulation of Development Targets

The development target of Edunite app is to provide education solutions for economically constrained elementary school students, so that they can gain additional learning. This application focuses on equalizing access to education by involving collaboration between donors and volunteers focused on Sumberbrantas Village, Batu City. Edunite aims to address issues related to the Sustainable Development Goals (SDGs), specifically point 4 (Quality Education), point 10 (Reducing Inequalities), and point 17 (Partnerships for the Goals).

Partnerships are a key focus in the development of Edunite. Edunite encourages cooperation between educational institutions, NGOs, and local communities to create a mutually supportive education ecosystem. Volunteers serve as mentors to students.

Table 1. Edunite Targets Using the SMART Method

Target Edunite	Metode Smart
Specific	The target of this program is elementary school students in need of learning support who are less capable of
Measurable	Measuring the success of the Edunite application is the collaboration between students and the general public who take part in learning activities and data entered in the application.
Achievable	Edunite application is realistic because many students want to take additional lessons but are constrained by economic constraints.
Realistic	This application can be implemented by working with donors, conducting regular open recruitment of volunteer members, and disseminating information for students who want to take part in additional learning through elementary schools and open information.
Time Bound	The implementation of the Edunite program will be carried out for a trial period of 5 years, if the program is successful then the Edunite application can be continued.

3. Target Achievement Analysis

Table 2. Edunite Target Achievement Analysis

Target Outcome	Difficulty Level	High Cost
Providing access to education for primary school students who need additional learning but are economically constrained	• Provide material resources for students • Provide training to volunteers	Cost of app creation, maintenance and development
Joint collaboration between donors, volunteers, communities and stakeholders	• Convince with effective communication • Cooperate	Providing feedback

Based on the table above that has been analyzed, it can be concluded that in this idea the creation of an innovation "Edunite: Collaborative Education Application to Increase Access to Basic Education (APD) through Flexible Learning and life skills". This Edunite application is expected to be a solution in collaborative education access to increase PPE with flexible learning.

4. Elaboration of Work Plan

4.1. Target Achievement Stage

This creative idea was developed using research and development (R&D) methodology using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The research method and the use of the model are tailored to the needs and the end result of this creative idea. The following is an explanation of the plan to achieve the objectives based on the ADDIE model:

Figure 1. ADDIE model

A. Stage 1 *Analyze*

In the analysis, the author identifies educational problems that exist in Batu City through experience and interviews. After understanding the problem, the author devised a solution to overcome it. From volunteer teaching activities, the author created the "Edunite" application to improve access to basic education through flexible learning and life skills. This idea comes from the author's experience and evaluation

B. Stage 2 *Design*

After doing the initial stage, namely the analysis stage, then determine the design that will be implemented. The design is an application that can be a solution to the problems that have been analyzed. Therefore, the design of the application includes features, application design, color palette, and so on. The design is written and visualized by creating a prototype.

C. Stage 3 *Develop*

In stage 3 is development, the ideas that have been designed by the author need to be re-analyzed to adjust to the needs which at this time are focused on Batu City. The Edunite application that has been designed is reviewed to fit the target and can be used by several parties that will affect the sustainability of this application such as donors and volunteers. Development will be carried out within a period of 3 months.

D. Stage 4 *Implement*

After the review is done and has been updated, the application can be submitted first. Testing this application to the community, which in this creative idea is focused in the Batu City area, in the implementation of the Edunite application, promotion and counseling are needed which can be done through social media such as Instagram, TikTok and so on. From the trial, the feasibility of the application can be known.

E. Stage 5 *Evaluate*

At the last stage, it is no less important, namely the evaluation stage, after conducting an application trial, the author will distribute questionnaires about the application and see whether the program is running in Batu City which will later be evaluated.

4.2. Application Development

The Edunite application was created to provide equal access to students who want to get learning support but are economically constrained. In the Edunite application, there are several learning resources and media specifically for student accounts and in addition to that, the Edunite application provides accounts for users other than students (visitors to the application, who are not students

4.3. How the Product Works

The Edunite app is designed for all ages, from elementary school children to the elderly. Therefore, it must pay attention to ease of access for all ages. Here's how the Edunite app works:

1. The Edunite app is available on the Play Store for students and the general public, with different interfaces as selected during registration.
2. Registration is free using email or mobile number, and students can use parents' phone numbers.
3. After registering, users choose between students or the general public, which will direct them to different home pages.
4. Students and the general public fill out biodata
5. The student homepage focuses on learning with materials, schedules, study groups, and Q&A sessions.
6. Meanwhile, the general public homepage offers activities such as donations, lesson sharing, and volunteer registration.
7. This application can be accessed anytime and anywhere with an internet connection, and users do not need to re-register if they remember the email used

4.4. Product Advantages

Edunite applications are included in educational applications that are equipped w i t h donations and assistance from various parties to help sustain learning activities, therefore the following is an analysis of the advantages of Edunite educational applications:

Table 3. Edunite Targets Using the SMART Method

Product Name	Excellence
Edunite	a. Use of the app is free of charge b. There is a clear learning schedule c. There is a feature to ask questions and discuss directly with the mentor d. Can carry out face-to-face learning

Teacher's Room	a. Subscription fees are relatively expensive b. Limited access for users in remote areas c. no feature to share materials with friends d. Lack of direct interaction features with teachers
Brainly	a. Not all features are available for free b. Answers given are not always accurate and lack of reference sources c. No feature to discuss with other users d. Lack of direct interaction with teachers/experts.

4.5. Technical System Design of Edunite

To ensure the effective and sustainable operation of the Edunite application, a structured and role-based technical system has been designed. This section elaborates on the key technical mechanisms that support user management, content curation, and learning outcome measurement.

a. User Management System

Edunite applies a role-based access control (RBAC) system with three primary user types, each with distinct access privileges:

- Student Accounts: Users under this category can access learning materials, participate in peer study groups, interact with mentors through the EduChat feature, and complete interactive quizzes. They also have access to the "My Notes" feature to manage learning reflections.
- Community Accounts (Donors, Volunteers, Teachers): This category includes access to donation features (monetary or in-kind), educational content sharing (lesson videos, worksheets), volunteer registration forms, and a space offering feature for offline learning hubs.
- Administrator Accounts: Admins oversee the verification of community-submitted materials, user registration approvals, content moderation, and platform usage analytics.

To enhance data security, Edunite utilizes two-factor authentication (2FA) during login processes for all accounts.

b. Learning Content Curation

All learning materials uploaded to the platform undergo a structured **content curation process**, coordinated by an internal editorial team composed of elementary school teachers, experienced volunteers, and instructional designers.

- Content must align with Indonesia's national curriculum and be adapted to local educational needs in Batu City.
- Accepted content types include text modules, short educational videos, interactive exercises, and thematic quizzes.
- Community members (teachers or volunteers) can submit proposed materials via a dedicated upload portal. However, only administrators and assigned content curators can approve and publish the materials after quality assurance checks.

This process ensures that the materials remain age-appropriate, inclusive, and pedagogically sound.

c. Learning Outcome Measurement System

Edunite integrates a learning analytics dashboard to monitor user engagement and academic progress. The system automatically collects and evaluates the following indicators:

- Completion rates of learning modules and quizzes
- Active learning time on the platform
- Attendance records from virtual or face-to-face learning sessions
- Student feedback and mentor notes

The data generated is compiled into a monthly Student Progress Report, which is accessible to parents, mentors, and the platform administrator. These reports provide insights into each student's strengths, areas for improvement, and recommended next steps in their learning journey.

This data-driven approach enables more targeted instructional support and fosters accountability among users, aligning with Edunite's commitment to equitable, personalized, and high-quality learning experiences.

5. The product sustainability plan will be adjusted by year, here is the product sustainability analysis of the Edunite application

Table 4. Product Continuity Plan

Year	Plan	Target
2025	• Worked with some local schools to help realize the material that needs to be taught to students. • Complete the "Subjects" feature in collaboration with elementary school teachers and local schools	• Schools and teachers at primary schools in Sumber Brantas village, Batu city
2026	• Submission and counseling of Edunite application products, Establishing cooperation with application development experts • Conduct internal testing, Evaluate the application before it is distributed / tested.	• App creation expert • Community and school of Sumberbrantas village Batu city
2027	• Application testing, application development by looking at the features contained in the application • Manage application licenses and trusts that will be related to incoming funds on the application	• App creation expert
2028	• Socialization and outreach of the Edunite application until the application is known by the general public,	• General public in Batu City • Some schools in Batu City
2029	• Develop feed back or benefits to related parties, develop applications that are adapted to the times	• Stakeholders
2030	• Monitor the progress of the results of the annual increase, upgrade the Edunite application by attending training.	• Technologist

6. Prototype

Tabel 5. Prototype Product

Same Features on Both Displays	
	
Users can register in advance by filling in their username, email, and password on the Edunite app, as shown in the image above.	After completing the automatic registration process, users can select from the options above according to their preferences, choosing between student or general public.
Features for Student	**Features for community**

				No level	
After the user selects "student," they will be directed to fill in their personal information.	On the student display, there are options according to class to determine the level.	**Study Group:** a feature that brings together peers who are guided by mentors. **Study Schedule:** this feature allows students to view their schedule of activities for the month. **Edu Chat:** this feature allows students to privately ask mentors questions about assignments or material they do not understand. **Subjects:** contains several compulsory subjects in elementary school, including material and videos. **My Notes:** a feature that students can use to record important information related to their learning. **Let's Create Something Amazing:** an additional feature of the Edunite app that provides information and creative ideas accessible to students. **Interactive Quizzes**: contains subject-specific quizzes for students.	After users select "Community," they will be directed to fill in their personal information.		**Donations:** With this feature, the general public can make donations in the form of money or goods that can be used 100% for students. **Teachers Sharing Knowledge:** This feature is specifically for elementary school teachers who want to share their knowledge in the form of materials, educational videos, and so on to be taught to students. **Volunteers:** Volunteers can fill out a brief profile and state their reasons for wanting to volunteer. Volunteers will be contacted later to arrange class assignments and teaching schedules. **A Place for You:** This feature is for individuals who wish to provide a learning space, which will be followed up on for mutual agreement.

As part of the effort to gain a comprehensive understanding of the condition of basic

education in Batu city, statistical data related to the number of schools, teaching staff, and students at the primary school (SD) level based on the sub-district division in the 2021/2022 academic year are presented. This data contains a breakdown between public and private schools which is an important reference in analyzing the capacity and distribution of educational resources in the area.

Table 6.Number of primary schools, teachers, and students by sub-district in Batu city (2021/2022)

Kecamata	School			Teacher			Student		
	Negeri	Swasta	Total	Negeri	Swasta	Total	Negeri	Swasta	Total
1 Bumiaji	26	11	37	329	188	517	4.608	3.147	7.755
2 Batu	15	2	17	230	13	243	3.540	282	3.822
3 Junrejo	23	2	25	276	20	296	3.990	173	4.163
Batu City	64	15	79	835	221	1.056	12.138	3.602	15.740

Analysis of the data revealed significant differences in the number of schools, teachers and students between sub-districts, reflecting the diversity of education needs and challenges in Batu city. This information provides a strong basis for formulating strategies to improve the quality of learning and the development of supporting programs, including the implementation of effective and sustainable additional tutoring according to the characteristics of each region.

Following the presentation of data showing the diversity of educational conditions between sub-districts in Batu city, it is important to review in more depth how these conditions are reflected in learning practices at the primary school level. Therefore, the author conducted observations and interviews in two sub-districts, namely Bumiaji and Junrejo sub-districts as case studies to conduct observations and interviews to obtain a real picture related to the implementation of additional tutoring and the role of various parties in supporting the student learning process.

In order to understand the learning conditions and educational support in elementary schools, beji 02 Elementary School was chosen as one of the elementary schools in Junrejo sub-district. Observations conducted on February 24, 2025 provided a real picture of the situation faced by public primary schools in the area, especially related to the implementation of additional tutoring and the role of various parties in supporting student learning.

Interviews with class teachers at SDN 02 Beji showed that student participation in additional tutoring is still limited. This is due to several factors, including the diverse number of students per class and limited financial support from parents. Although there is interest from students to take additional lessons, not all parents can provide adequate support, so many students cannot access additional lessons optimally. In addition, the budget efficiency enforced in schools is also an obstacle for schools to provide additional tutoring in a broad and organized manner. The initiative for additional tutoring so far has mostly come from teachers personally, especially for grade 6 students, while students in grades 1 to 5 have not received similar additional tutoring facilities.

From the student side, interviews with several Grade 1 students at SDN 02 Beji revealed different attitudes towards additional tutoring. Some students show high enthusiasm and plan to take additional lessons, while others prefer to utilize playtime and are only interested in additional creative activities such as drawing. The use of personal gadgets by students is also

an interesting phenomenon, where gadgets are used both as learning media through video tutorials and as a means of entertainment.

As an example of a school in this study, SDN 02 Beji reflects the general conditions faced by many primary schools in areas with limited budgets and parental support. The strengths of this school are the initiative and dedication of the teachers and the enthusiasm of the students. However, constraints such as limited funding and lack of parental support are key challenges that need to be overcome to improve the quality of learning and students' access to additional tutoring.

By using SDN 02 Beji as an example, this research provides a concrete picture of the dynamics of education at the primary level and underlines the importance of support from various parties, including the government, schools, teachers and parents, to create a conducive learning environment that supports students' optimal development. Interviews at SDN 02 Beji, located in Kecamatan Junrejo, provided a concrete picture of the dynamics of education at the primary level and the importance of support from various parties. Furthermore, interviews at SDN Tulungrejo 03 in Bumiaji Sub-district revealed that additional tutoring activities are very helpful in the learning process, especially for students with learning difficulties, and highlighted the role of the community and technology in supporting additional learning in the area.

Teachers at SDN Tulungrejo 03 in Batu City revealed that additional tutoring activities are considered very helpful in supporting the learning process, especially for students with learning difficulties. Additional tutoring in this area is organized by various parties, including students and the village government, with various models, namely free and paid tutoring. The teacher also expressed her support for the use of digital learning applications, especially if they are provided free of charge, as they can be a very useful tool for children in strengthening their understanding of the subject matter. This finding reflects the general condition in Bumiaji sub-district, where additional learning support comes from community initiatives and technology, as an effort to overcome limited resources in public primary schools.

In addition to interviews, questionnaires were distributed to two groups of respondents: parents of students and elementary school teachers in Batu City. The results from five parents revealed that 100% supported the Edunite application as an innovative solution for accessible tutoring. However, some respondents indicated technical barriers, with 60% reporting limited internet access and 40% facing challenges with mobile device availability. To address these issues, Edunite is designed with flexible access, allowing it to be used both online and offline, ensuring that students can continue learning regardless of their digital infrastructure limitations.

Furthermore, five teachers also responded to the questionnaire and similarly expressed full support (100%) for the development of Edunite. More than just endorsing the idea, the teachers stated their readiness to contribute to the application’s sustainability, whether by assisting students, helping design learning materials, or actively participating in outreach. These findings demonstrate strong alignment and enthusiasm from both educators and families, indicating that Edunite has the potential to foster collaborative learning environments and broaden educational access through community involvement.

These findings align with previous research highlighting the importance of community support and flexible learning approaches in addressing educational gaps (Bray, 2022; Watkins & Donnelly, 2021). Moreover, the enthusiasm of teachers and students despite resource limitations reinforces the relevance of collaborative tutoring models and digital innovations. The findings of this study align with international research that emphasizes the role of technology and community collaboration in addressing educational inequality. For instance,

Bray (2022) highlighted the effectiveness of community-supported tutoring programs in improving educational access in underprivileged areas. Additionally, Watkins and Donnelly (2021) stressed the importance of inclusive and collaborative practices in creating equitable learning environments. The Edunite application design also draws from the principles of the constructivist learning theory, which advocates for learner-centered environments that support interaction and engagement—principles that are operationalized in Edunite's features such as peer discussion forums, mentor support, and flexible access. These findings confirm that even in the design phase, user context and theoretical grounding are essential in shaping viable educational innovations.According to Zhu & Wang (2023), digital platforms that are accompanied by proper volunteer training can substantially improve student engagement and educational equity. Therefore, the design of Edunite as a low-cost, collaborative, and flexible learning platform resonates with international best practices in inclusive education and digital pedagogy.

3.1. Conclusion

The This article highlights the problem of inequitable access to basic education inBatu city, especially for elementary school students from underprivileged families. Through data analysis and case studies in several schools, it was found that limited infrastructure, parents' financial support and the lack of additional facilities such as tutoring are the main obstacles to equitable education. As a solution, the author proposes the development of Edunite application based on community collaboration, donors and volunteers. The app is designed to provide free access to additional learning, strengthen students' learning experience, and build a social network that supports inclusive education. The development of this application uses the Research and Development (R&D) method with the ADDIE model, which emphasizes the importance of needs analysis, user-driven design, continuous development, collaborative implementation, and systematic evaluation.

The implementation of Edunite is expected to increase learning motivation, expand access to education, and build community awareness and participation in supporting basic education. However, the success of this program is highly dependent on the readiness of technological infrastructure, volunteer training, and policy support from the government and educational institutions. Thus, the Edunite application innovation is a strategic step in realizing equitable access to inclusive and quality basic education, as well as a collaboration model that can be adopted in other areas with similar challenges.

Although the development of Edunite was based on a local Indonesian context, its approach and features have the potential to be adapted internationally, especially in developing countries facing similar challenges in educational access and equity. With its emphasis on collaboration, inclusion, and flexibility, Edunite offers a replicable model that contributes to the realization of global educational equity and supports the achievement of international education-related SDG targets.

Author Contributions

To promote transparency, we encourage authors to provide an author statement file detailing their specific contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should list authors' names first, followed by their respective CRediT role(s). For example: Nur Hudha: Conceptualization, Methodology, Software. John Smith: Data curation, Writing - Original draft preparation. Jane White: Visualization, Investigation. Bruce Buck: Supervision. Matt Jr.: Software, Validation. Peter Long: Writing - Reviewing and Editing.

All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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Declaration of Conflicting Interests

All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double anonymized) or the manuscript file (if single anonymized). If there are no interests to declare then please state this: 'Declarations of interest: none'. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches.

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