Development of an LMS-based e-literacy management model for managing the junior high school literacy movement

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Article info	Abstract
	This research was conducted because the Gerakan Literasi Sekolah (GLS) implementation in junior high schools has not run effectively and efficiently. Although the habit of reading books has been carried out in a scheduled and routine manner, literacy activities have not been managed well, and there are no structured steps. For this reason, the researcher developed an LMS-based E-Literacy management model for managing literacy activities to solve existing problems. This research and development design uses the Borg & Gall model, which is limited to stage 5, namely the main product trial. The research subjects were the principal of a junior high school, teachers or the GLS Team, and students. The resulting product is a Moodle LMS-based E-Literacy management model, model books, and user guides. Research results: 1) The implementation of the Junior High School Literacy Movement was carried out manually. 2) The weaknesses of the Junior High School Literacy Movement management that were carried out included not being managed systematically and not involving technology. 3) The development of the School Literacy Movement management model resulted in a Moodle-based E-Literacy management model with validation results from literacy experts of 87%, ICT experts of 89%, while the average application trial for teachers or literacy teams was 89%, and students were 86%, so based on this, the Moodle-based E-Literacy management model is in the very good category

1. Introduction

Humans need special communication skills to achieve their goals, one of which is literacy, which includes listening, speaking, reading, and writing (Rahman et al., 2019). Literacy must be mastered in communicating to convey ideas and messages properly. Communication is very important in the era of the Industrial Revolution 4.0, especially in the field of education, in order to convey and respond to ideas. It is in line with Suroyo (2022), who stated that the success of 21st-century education is measured through 4C: creative, critical thinking, communicative, and collaborative. Literacy is important for conveying ideas and messages well; those who communicate can benefit. These communication skills are essential in life and civilization, especially in education.

Along with the times, literacy is not only a means of communication but also the focus of development in various countries (UNESCO, 2017: 9). Literacy influences the success of education in the current era (Iman, 2022). Through WEF 2015, UNESCO stated literacy as one of the 21st-century skills. The benefits of literacy in education include increasing vocabulary, maximizing thoughts, acquiring new knowledge, improving personal skills, and developing an understanding of information (Sumiati et al., 2020). Devianty's research (2019) states that literacy is not only about reading and writing but also its implementation in daily life. Understanding literacy will be easy if it is based on formal and non-formal education because literacy and education run synergistically. OECD data shows a decrease in PISA scores in math, reading, and science in 2022, even in the lowest category in the three areas.
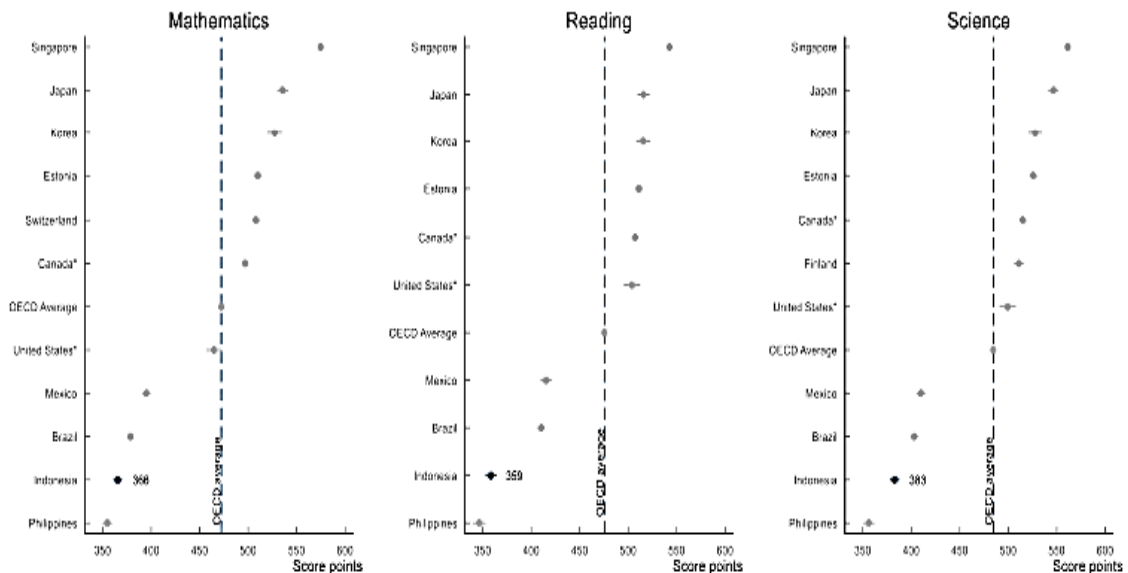
Figure 1. Trends in Indonesia's Program for International Student Assessment (PISA) scores average results in 2022

In reading, between 25% of students in Indonesia are at level 2 or higher, with an OECD average of 74%. At a minimum, these students can analyze the main idea of a simple passage, look for complex explicit ideas, and think about the target and type of text when instructed. The minimum skill level in reading achieved by 15-year-old students (level 2 or higher) is achieved by Singapore with a percentage of 89% (level 5). In contrast to Singapore, students in Indonesia could not score at level 5 or higher in reading.
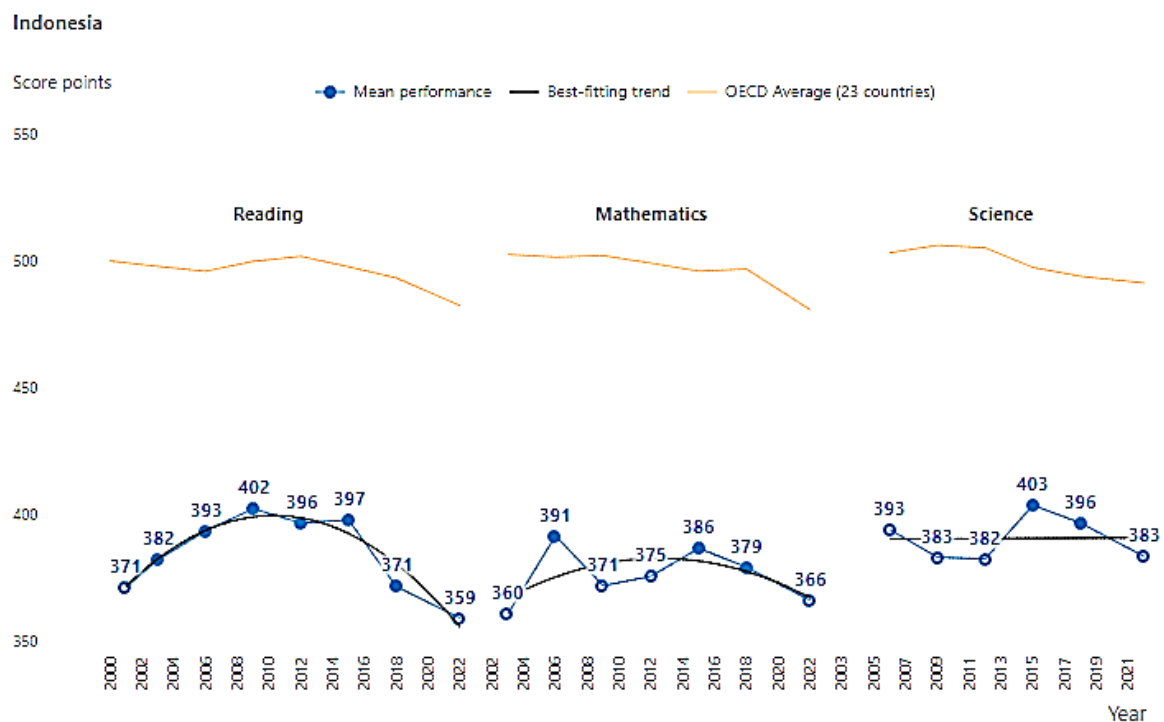
Figure 2. Indonesia's PISA results in 2022

Based on this data, it can be concluded that the PISA score in reading literacy in Indonesia is still not optimal and is below the average OECD score in 2022. The government promoted the National Literacy Movement (GLN) to cultivate literacy, especially reading literacy. The Ministry of Education and Culture organizes GLN with all education policymakers implementing the School Literacy Movement (GLS) components (Hidayah et al., 2019). Permendikbud No 23/2015 requires schools to set aside time for routine reading activities as character building. Reading literacy plays a significant role in improving students' insight and character. Hayun and Haryati (2020) stated that GLS is a government effort to improve students' literacy skills involving all stakeholders.

National Assessment (AN) is a government policy through the Ministry of Education, Culture, and Research to support the optimization of reading literacy. This policy is contained in Permendikbudristek No 17 of 2021 on AN as an evaluation of the education system at the primary and secondary levels. AN is carried out in three activities: minimum competency assessment, character survey, and learning environment survey (Article 8, paragraph 1). The minimum competency assessment in Article 9, paragraph 1 assesses students' reading literacy and numeracy competencies. Dewi (2021) found that it is important to instill a culture of reading literacy early to provide minimum competencies.

The development of government policies shows that information technology is present in every aspect of education. Information technology has great potential and impact on the learning process. As part of information technology, computers and the internet are integral to acquiring new knowledge (OECD, 2016). OECD (2016) mentions important reasons for developing information technology in education, including improving learning experiences, the need to master information technology in society, flexibility of use, and reducing administrative costs. Literacy as part of education can implement information technology for more advanced, modern, and efficient literacy activities.

2. Literature Review

Management

Management is generally considered a discipline that teaches achieving organizational goals through joint efforts with many people or resources. Etymologically (linguistic), the word "management" comes from the old French word "management," which means the art of implementation and management. Management is the science of managing the use of existing assets. Human and other assets are used successfully and efficiently to realize a provision. (Rana, 2024). Management is often described as a science, skill, and profession. It is said to be very scientific, as proposed by Luther Gulick because management is considered a field of knowledge. Management systematically seeks to discover why people work together to achieve goals and organize their cooperation techniques to make them more useful. Management coordinates all resources by planning, organizing, identifying, directing, and supervising the workforce to achieve predetermined goals. (Herlina et al., 2024). According to the experts listed above, management is a process that includes planning, organizing, directing, and supervising an organization to achieve the specified goals. Management is also something that is done in order to organize and manage resources to achieve the specified goals effectively and efficiently.

Literacy
Concept and Substance of Literacy

Literacy, which was originally defined as the ability to read and write, has now developed into the ability to process and understand information in depth. The definition of literacy has shifted with the times; it is no longer limited to reading and writing activities. The new literacy paradigm includes the process of understanding, using, analyzing, and transforming texts (Alfiati, 2019). It emphasizes the importance of understanding the truth of the text and describing and modifying its important elements according to the applicable rules. Utami (2022) added that understanding literacy needs to be reviewed from ontology, epistemology, and axiology perspectives to achieve its essence.

Regarding ontology, literacy is rooted in language and literature, focusing on reality and truth, while epistemology addresses knowledge and how it is acquired, and axiology emphasizes moral, aesthetic, and socio-political values (Arifian, 2019). Initially limited to reading and writing, literacy has since expanded to include numeracy, science, finance, culture, citizenship, and digital (Abidin, 2014), although the foundation of language literacy remains fundamental. Literacy is important in education, equipping educators and students with the knowledge and skills to face real-world challenges. Literacy implementation also instills values such as independence, discipline, and responsibility. Furthermore, literacy supports the ten 21st-century skills proclaimed by the World Economic Forum (2016), including analytical thinking, creativity, and problem-solving.

Concept and Substance of E-literacy

Wiyono (2017:14) states that literacy is a person's learning activity related to reading and writing to understand information. However, along with the development and challenges of the times, the definition of literacy has also developed. The new definition of literacy refers to the many varieties of literacy, including media, computer, and science. E-literacy can be interpreted as the ability to use information technology devices and computers integrated with information literacy, moral literacy, media literacy, and teaching and learning skills. E-literacy can also be defined as an important ability that individuals have to successfully follow an era based on electronic tools or facilities and even extend to technology and the internet. From the opinions of literacy experts, it can be concluded that E-literacy is the activity of reading and writing to obtain new information and knowledge using technology and the internet, such as the Learning Management System (LMS) and other applications as an intermediary.

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Concept and Substance of School Literacy Movement (GLS)

The Directorate General of Primary and Secondary Education of the Ministry of Education and Culture (2018), in the master design of the School Literacy Movement, states that the ever-evolving civilization has exceeded the imagined boundaries. The rapid flow of audiovisual culture has caused the tradition of reading and writing not to become a habit. In education, students are more fond of online media than reading and writing. Through the Ministry of Education and Culture, the government pays great attention to overcoming this phenomenon by campaigning for the cultivation and culture of reading and writing in the school environment through the School Literacy Movement (GLS).

Stages of GLS

The School Literacy Movement (GLS) begins with the school principal forming a School Literacy Team (TLS), involving all school members for planning, implementation, reporting, assessment, and evaluation, aiming to create a conducive academic environment and foster enthusiasm for literacy. The next stage is the habituation of reading at home involving teachers, students, and families (Wiedarti, 2016) and the development of a compulsory reading curriculum to improve literacy skills and the nation's competitiveness (Miller & McKenna, 2016). This curriculum consists of three stages: habituation (no bills), development (non-academic bills), and learning (academic bills), with activities such as 15-minute reading, reading corner management, quizzes, literacy ambassadors, and more. The next stage of GLS includes literacy-based learning in subjects by paying attention to teaching sources and materials, learning strategies (pre-reading, during reading, post-reading), and assessment, as well as the use of the Know-Ingin-Learn (TIP) Table to improve text analysis. Reading is emphasized for lifelong learning, and questioning about books and Daily Reading Journals complement GLS to monitor students' literacy development. Utilizing a Moodle-based Learning Management System (LMS) can support the management and implementation of GLS digitally, facilitating coordination, task collection, and monitoring of students' literacy development**.**

Concept and Substance of LMS

A Learning Management System (LMS) is an important element in online learning that facilitates learning management from planning to assessment (Fitriani, 2020), functioning as a system that utilizes information technology to support the learning process. Through LMS, students can access materials, discuss, interact, and access assignments easily while encouraging teachers to be creative in creating materials and providing flexibility of access (Bradley, 2021). The LMS also facilitates teachers as a medium for discussion, structuring structured online activities, formulating learning objectives, providing various student options, and supporting problem-solving and decision-making skills. LMS has main characteristics such as self-service, online access via the internet or intranet, online assessment facilities, collaborative learning services, and easy management of human resource training (Pratama & Kusuma, 2021; Hardika, 2021). LMS includes administration, documentation, validation, reports, distance learning activities, and presentation of multimedia modules, with the hope of improving material mastery and learning quality. Some commonly used LMS platforms include Moodle, Schoology, and Edmodo.

Moodle Concept and Substance

Moodle, which stands for Modular Object-Oriented Dynamic Learning Environment (Irawan & Surjono, 2018), is one of the top Learning Management Systems (LMS) in the form of a complete application that can transform learning media into web form. Moodle has facilities for creating and managing courses, checking student attendance, and managing quizzes, assignments, and surveys,

making it easier to manage online learning. Gamage et al. (2022) added that Moodle is an adaptive and collaborative learning platform widely used in online learning to improve student performance, satisfaction, and engagement. The utilization of Moodle also continues to grow to ensure academic integrity, ethics, and security, improve speed and navigation, and involve artificial intelligence. As such, Moodle is a popular, easy-to-use educational application with features that support engaging and customized digital learning. Moodle facilitates various online learning activities, from material delivery to user assessment and interaction.

Moodle Features

Moodle offers a variety of features to facilitate learning, including Moodle Video/Virtual Tours and Moodle Survey Tools (Gamage et al., 2022), as well as Workshop features for peer assessment and E-Portfolios for collecting digital learning outcomes. The Moodle Lessons feature allows teachers to create branching exercises responsive to student responses, supporting the personalization of learning. Moodle Quizzes provide various assessment types, Moodle Discussion Forums facilitate interactive discussions, and the 'Wiki' tool encourages collaborative document creation. In addition to these features, Moodle excels in ease of use, flexibility, closed group collaboration, free access through various devices, and does not require a school server. Moodle can be accessed anytime and anywhere, updated, and used by various parties (schools, students, teachers, parents). It also uses a social media communication model with materials, assessments, team teaching support, notifications, and badge features. Natasia (2020) emphasized the ease and benefits of Moodle in improving student outcomes and engagement, although initial adaptation may be required.

Borg and Gall Research and Development Model

According to Borg & Gall (2003), research and development to produce products is carried out through 10 steps. The stages of research and development are depicted through the framework in **Figure 3**.
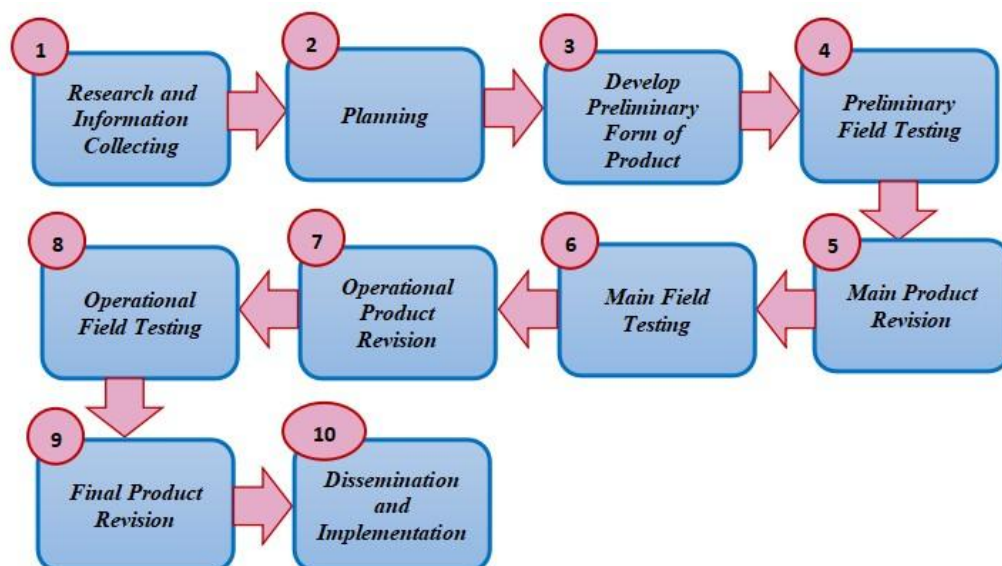
Figure 3. Steps of Borg & Gall research and development

The stages of research and development, according to Borg & Gall, begin with information gathering, needs analysis, literature review, preliminary studies, and report preparation (Research and Information Collecting), followed by planning, which includes problem identification, goal

formulation, research procedures, and small-scale feasibility trials (Planning). The next stage is the development of the initial form of the product, including the preparation of material content, product preparation, and evaluation instruments (Develop Preliminary Form of a Product), followed by initial field trials, data collection, and analysis (Preliminary Field Testing). After that, product revisions were made based on input and suggestions from the feasibility test and response test (Main Product Revision), followed by a limited field trial, quantitative data analysis, and comparison of research results (Main Field Testing). Next, the product was revised based on suggestions from the limited field trial (Operational Product Revision), which was then widely tested in 10 to 30 schools with 40 to 400 research subjects (Operational Field Testing). Finally, a final product revision is carried out based on suggestions from the operational trial (Final Product Revision). Dissemination and implementation is the stage of product dissemination or dissemination. The Borg & Gall stages can be used as guidelines in designing new products, and the subsequent research steps are systematically carried out.

Review of Relevant Research

Management in organizations aims to achieve common goals by managing elements that can be optimized (Gemnafle M. and Batlolona J.R., 2021), and quality management is essential for organizational success. Basic literacy is an important part of the literacy that must be possessed to face the challenges of the 21st century (Nudiati et al., 2020). However, Nudiati et al.'s research shows that the literacy of University students in West Java, especially numeracy, still needs to be improved. Yuningsih's research (2019) emphasizes the importance of 21st-century skills education to prepare the golden generation of 2045, who are literate, competent, and have character, in line with the research objective to improve literacy skills in facing 21st-century challenges. Vitaloka et al. (2020) found a significant effect of GLS on students' reading habits through habituation, development, and learning. In contrast, this study developed a Moodle-based e-literacy model to support GLS. Research by Setyaningsih et al. (2019) and Saputra et al. (2020) also involved information technology in the literacy model, focusing on digital literacy and digital curriculum development.

Framework for Thinking

Literacy implementation is important in improving students' reading abilities and skills, which can produce quality graduates. However, in its implementation, there are gaps where literacy activities in schools experience obstacles, namely ineffective management that impacts school literacy activities that are less interesting and low levels of student interest in reading. Therefore, an innovative literacy management model is needed to overcome the problems that arise. Researchers will develop a Moodle-based E-literacy management model. After the model is formed, a model along with a description and guidelines for using the Moodle-based E-literacy management model for teachers or GLS teams will be created.

3.   Method

The research is in the form of development research to produce certain products tested for effectiveness and following market needs (Sugiyono, 2017). This research used a mixed method approach with a sequential exploratory design, namely qualitative data collection at first and then continued with quantitative data collection.

This research was conducted at Satya Wacana Salatiga Christian Junior High School in the odd semester of the 2024/2025 academic year. The research subjects were teachers and students of the junior high school. The research timeline included several activities from August to October, starting

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from potential problems, information gathering, product design, design validation, design revision, product trial, and product revision. This research uses the Borg and Gall development model, but due to limited time and resources, product development will focus only on the fifth step, namely major product revision.

The development procedure begins with research and information collecting, which identifies problems and gaps between literacy goals and implementation in the field, as well as a review of literacy goals. The researcher analyzed the literacy needs at Satya Wacana Salatiga Christian Junior High School through observation, documentation study, and interviews, which showed no E-literacy management model for GLS implementation. The next stage is planning, which includes exploring the problem, preparing research objectives and procedures, using data triangulation for problem identification, determining the objectives and benefits of the E-literacy management model, determining the development model, preparing the product design, and formulating product validation instruments. The product design stage includes developing the design of the E-literacy management model with Moodle and making instructions for use. Evaluation is carried out at every stage, from checking data at school, consulting with supervisors, expert validation, and trials at school.

Literacy and ICT experts conducted product validation to determine the advantages and disadvantages of the product and assess its effectiveness and feasibility. The trial design was conducted after product revision to check its efficiency compared to the old product, with a limited trial at Satya Wacana Salatiga Christian Junior High School. The test subjects were selected using a purposive sampling based on the criteria of good ICT skills. The data collection techniques included direct interviews.

4. Results

Implementation of the School Literacy Movement (GLS)

This activity has been running for three years, but only the reading habituation stage (40 minutes once a week) has been implemented. Based on questionnaires (5 teachers and 20 students), 80% of literacy activities are limited to reading and journaling, 84% are monotonous, and 70% have not been evaluated. Interviews with the principal, GLS team coordinator, and GLS implementing teachers in July 2024 concluded that the implementation of GLS was less effective because the POAC (Planning, Organizing, Actuating, Controlling) management function was not optimal. It was caused by students' lack of interest due to monotonous media and methods, limited reading resources in the library, and inappropriate GLS management.

GLS planning at Satya Wacana Christian Junior High School has been carried out through needs analysis based on education report cards and National Assessment (AN) recommendations regarding reading literacy. The school also developed a schedule and formed a literacy team with a coordinator and members. Activities include reading library books together, keeping a reading journal, and a literacy stage. However, implementing GLS is less detailed and optimal, with the habituation, development, and learning stages not maximized. In addition, no authentic data on the implementation of GLS has been documented by the GLS team. The GLS organization only consists of one coordinator and two members without a clear division of tasks in the GLS Team Decree.

The implementation of GLS at Satya Wacana Christian Junior High School has not been preceded by scheduled debriefing for school stakeholders, but only sudden socialization that lacks details. Variations in answers related to the GLS implementation guidebook indicated the lack of socialization. The governance applied is the formation of a GLS team that makes a joint program, but some parties do not know the governance, indicating a lack of coordination. The strategies implemented include presenting ANBK results in literacy aspects and encouragement to excel in

literacy. Program supervision and evaluation are conducted through monitoring and evaluation (M&E) mechanisms, but program effectiveness evaluation has not been fully implemented. There are various assessment methods, ranging from M&E instruments to informal observations of students' commitment. There were also variations in responses regarding GLS reports, ranging from complete reports to daily activity reports. Positive elements of GLS include prioritizing school assets, increasing interest in reading, and practicing language skills. Negative elements included literacy activities without full awareness, not involving all teachers, difficulty motivating students, and lack of ability to filter information. Effective and optimal implementation of GLS requires support from various parties, improving students' ability to filter information, structured monitoring and evaluation, and strong commitment.

Weaknesses of the Literacy Management Model in the School Literacy Movement

The implementation of the School Literacy Movement (GLS) at Satya Wacana Christian Junior High School shows monotonous activities limited to reading and reflection, so students feel a lack of variety and boredom. Observations show the need for various activities to maintain student interest and participation, as the limited activities lead to repetition of the same routine, where students only read the same book every week and write without interaction or discussion. This limitation, which only focuses on reading and writing reflections, causes students to get bored and lose motivation easily, potentially reinforcing negative views towards reading. Student interest in reading is a key factor in the success of a literacy program, and monotonous activities can reduce it, leaving students feeling disinterested and potentially stifling insight and creativity. Students' dissatisfaction with literacy activities impacts their motivation and attitude towards literacy, where boredom can divert them to other activities that do not improve literacy skills. Teachers play an important role in presenting interesting and relevant literacy activities by introducing different types of reading and using varied and dynamic approaches. Schools must explore alternative activities such as group discussions and technology such as e-book apps or disk platforms to overcome monotony.

Development of a Moodle E-literacy management model for the management of the Junior High School Literacy Movement

Developing an effective literacy management model for implementing the School Literacy Movement (GLS) requires careful planning, focusing on practical experience, feedback, and weakness analysis. The resulting model is electronic literacy activity management, namely E-literacy management, which implements the Moodle LMS learning platform. The model was developed at Satya Wacana Christian Junior High School with a systematic approach based on Borg & Gall's development theory, which includes five main steps: initial research and information gathering, planning, initial product development, field trial, and revision of the main product. These steps are designed to ensure the relevance and effectiveness of the Moodle E-literacy model in the context of GLS. Applying this model is expected to overcome challenges in implementing GLS and increase students' literacy interest.

Initial research and information gathering were conducted through interviews with the principal, teachers, and students, which revealed constraints such as low student reading interest, limited physical reading materials, and the need for digital-based learning. The principal emphasized the need for an easily accessible technology-based platform, with Moodle as a potential solution. Teachers stated that literacy implementation was not regular and without careful planning and continuous evaluation. Students wanted more interesting GLS activities to increase their enthusiasm for reading. Based on the results of this initial research, a Moodle-based E-Literacy model was designed with a chart that includes planning the development of the Moodle E-Literacy

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management model, organizing, implementing, and evaluating, which includes problem identification, planning the development concept, making Moodle E-Literacy products and user manuals.

The expert validation of the Moodle-based literacy model showed good results overall, with an average of 88%. Aspects of display quality and usefulness were rated "Very Good" with an average of 89% and 91%, respectively, while aspects of technical quality were rated "Good" with an average of 84%. The validators suggested improving the interface navigation to make it more user-friendly, especially for students less familiar with digital platforms. Educational technology experts and educational management experts conducted this validation.

Table 1. Results of expert validation

Aspect	Technology Expert (%)	Content Expert (%)	Average (%)	Criteria
Display Quality	90	88	89	Very Good
Usability	92	90	91	Very Good
Technical Quality	85	83	84	Good
Overall Average	**89**	**87**	**88**	**Very Good**

The validation results showed that the Moodle-based literacy model met the criteria of very good in the aspects of usefulness and display quality, while the technical quality aspect received a good rating. The validators suggested improving the interface navigation to make it more user-friendly, especially for students less familiar with digital platforms.

Furthermore, the Moodle-based literacy model was piloted for four weeks by three user groups: students, teachers, and the GLS team, and it included digital literacy activities such as reading materials, forum discussions, and interactive quizzes. The pilot test results showed good acceptance from all groups, with an overall average of 88% and "Very Good" criteria. The usefulness aspect received the highest rating (94%) because Moodle facilitates evaluation for teachers, interaction for students, and management for administrators.

The display quality and technical quality aspects were rated as "Good," averaging 85% and 87%, respectively, although the technical aspect received a note regarding network stability. Students felt that the discussion forum feature was very helpful in understanding the material, while teachers felt time savings with automatic evaluation. Based on the results of previous trials and expert validation, revisions were made, including simplifying menu navigation, adding gamification features such as leaderboards and badges, and enriching literacy content with videos and infographics to improve user experience and overcome the obstacles found.

Table 2. Field trial results

Aspect	Teacher (%)	Student (%)	GLS Team (%)	Average (%)	Criteria
Display Quality	85	80	90	85	Good
Usability	95	92	94	94	Very Good
Technical Quality	88	85	87	87	Good
Overall Average	89	86	90	88	Very Good

Analysis of the trial results showed that the display quality was rated well by teachers and students, with higher scores from the GLS team due to technical mastery. The usefulness aspect received the highest rating (94%), indicating that Moodle facilitates evaluation for teachers, interaction for students, and management for administrators. Technical quality was also rated as good, although there were notes regarding network stability during access. Students found the discussion forum feature useful in understanding the material, while teachers were helped with

time efficiency thanks to automatic evaluation in Moodle. Overall, the model was rated as excellent in usefulness and fair in appearance and technical quality.

5. Discussion

The E-Literacy Moodle management model aligns with the management theory proposed by Fayol in Rana (2024), which includes planning, organizing, implementing, and supervising. The pilot test results showed that the E-Literacy Moodle development model can help GLS planning. The features provided by E-Literacy Moodle, such as modules, quizzes, and discussion forums, greatly supported the implementation of GLS activities. The core activities of GLS, namely the habituation, development, and learning stages, can be easily designed and managed through this platform. For example, modules can be used to present material on effective reading techniques, while quizzes can be used to measure students' understanding of the material that has been learned.

Using E-Literacy Moodle also facilitates the data collection of GLS needs and the creation of activity schedules. Teachers can upload documents such as student reading interest survey results, monthly literacy activity schedules, and reports. In addition, E-Literacy Moodle also allows teachers to monitor individual student progress through the reporting feature. Thus, teachers can provide more personalized and targeted feedback to each student.

Next, at the organizing stage, E-Literacy Moodle can facilitate the organization of GLS teams. Collaboration features such as discussion forums and calendars allow team members to exchange ideas, share tasks, and monitor the progress of GLS activities. With this platform, each team member can easily access relevant information and contribute according to their duties. A clear and structured GLS team task description can be uploaded to E-Literacy Moodle so that each member understands their roles and responsibilities.

Furthermore, E-Literacy Moodle can support the implementation stage of GLS, which consists of habituation, development, and learning. The quiz feature on Moodle allows teachers to give a pre-test before starting the program to measure students' initial abilities. The activities of reading 15 minutes a day and reading stories can be easily monitored through discussion forums or assignments given through Moodle. Students can share their reading experiences and get feedback from teachers and classmates. At the development stage, the TIP table feature integrated into Moodle helps students reflect on what they have read and encourages them to seek further information.

The learning phase also runs with the support of E-Literacy Moodle. Storybook reading activities for one hour once a week can be scheduled and monitored through the calendar on E-Literacy Moodle. Students can keep a reading journal to record their thoughts and feelings after reading. A post-test quiz given at the end of the program can be used to measure students' reading improvement. The online certificate feature on E-Literacy Moodle provides additional motivation for students to complete all GLS activities. Thus, E-Literacy Moodle can be a very useful tool in supporting the management of the Junior High School Literacy Movement.

The last part of the GLS management process is supervision. E-Literacy Moodle allows users to provide regular feedback regarding the GLS program. The questionnaire menu can be used to measure the level of student satisfaction with the activities that have been implemented, as well as identify the obstacles faced. The data obtained from this questionnaire is very useful for evaluating and improving the GLS program. In addition, E-Literacy Moodle also makes it easier to compile reports on the implementation of GLS. All data collected from quiz results, assignments, and forum discussions can be easily accessed and processed to produce a comprehensive report. This report can account for implementing the GLS program for the school, parents, and other stakeholders.

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With a structured and complete report, the effectiveness of the GLS program can be measured objectively.

Technology integration in GLS also supports digital literacy theory, which emphasizes the importance of students' skills in reading, analyzing, and evaluating information through digital media. This model helps students improve their reading skills and introduces them to digital literacy, which is essential in the modern era. (Hardiansyah et al., 2024). E-Literacy Moodle is in line with digital literacy theory. Students read the text and interact with digital media such as video, audio, and simulations provided through E-Literacy Moodle. It allows students to develop critical and creative thinking skills in analyzing information from various sources. In addition, the collaborative features on E-Literacy Moodle also facilitate discussion and exchange of ideas between students so that they can learn from each other and develop digital communication skills.

E-Literacy Moodle also contributes to the character-building of digitally literate students. By getting used to accessing and utilizing various sources of information online, students are expected to become active, independent learners. In addition, through participation in Moodle-based GLS activities, students are trained to be responsible in using technology. It is in line with the goals of national education, which aims to produce a young generation that is smart, creative, and characterized.

The validation and pilot test results show that the Moodle-based E-Literacy model is very effective in supporting the management of the School Literacy Movement at Satya Wacana Christian Junior High School. With various features such as discussion forums, e-portfolios, and automatic evaluation, this model improves student engagement, teacher efficiency, and technical management. Post-trial revisions further refined the model for large-scale implementation. Overall, the model provides an innovative solution to address literacy challenges in schools and has the potential to be adopted in other schools.

6. Conclusion and Implications

Based on the results of the research and discussion, it can be concluded that implementing the Junior High School Literacy Movement management includes the formation of the GLS team, unstructured program preparation, and one-day-one-reading activities that have been managed unorganized. The main weakness of GLS management applied by schools is that literacy activities are still manual and do not utilize technology. Therefore, an E-literacy Moodle management model was developed for the management of the Junior High School Literacy Movement, with the following characteristics: (a) E-literacy Moodle can be used by teachers, GLS teams, and students, and is equipped with planning, organizing, implementing, and supervising menus; (b) E-literacy Moodle has been validated by experts and received excellent ratings, with content expert validation results of 87%, ICT experts of 89%, and the average expert validation results of 88%; (c) The results of the E-literacy Moodle trial to test the quality of the product showed 89% for teachers, 90% for the GLS team, and 86% for students, with an overall average of 88%, so that E-literacy Moodle can be categorized as very good.

Based on the results of this study, some suggestions can be made. Schools should increase student involvement in planning literacy activities and E-Literacy Moodle content through forums or discussions to gather ideas and input, thus creating a more relevant program and increasing student ownership. For teachers or literacy teams, it is recommended to attend literacy training involving innovative and interactive technology, covering the latest teaching techniques, the use of technology, and effective assessment methods, in order to be able to develop an E-Literacy Moodle management model and utilize other digital media. For students, it is recommended that E-Literacy Moodle be used to make GLS activities more organized and meaningful because this platform is

made to provide convenience in managing GLS. For future researchers, it is recommended to continue the development of E-literacy Moodle with a focus on long-term implementation and evaluation, conduct more thorough pilot practices by developing additional features such as personalization of learning, collaboration between students, and integration with external resources, as well as improving the quality of content, interface design, and socialization and training for users, so that E-literacy Moodle becomes a more comprehensive and effective solution in managing GLS and increasing students' interest in reading and literacy skills.

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