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THE EFFECTIVENESS OF GBL MOODLE USING SET TOP BOX: RIGHT AND LEFT BRAIN PERFORMANCE IN THE LITERACY PROCESS

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Abstract

Education 5.0 connects digital information and technology with human social and emotional capacities to enhance well-being. In Proposition 4.0, the role of technology in education is to increase the speed, accuracy, and knowledge of teaching. The main idea is to incorporate Industry 4.0 technology into education and training institutions - the Internet of Things (IoT), one of which is by utilizing a Single Board Computer (SBC) such as a Set Tob Box (STB) which is used as a platform to increase effectiveness and efficiency in the learning context. Using a game approach to teach a topic is one way to engage students. By using the game strategy, students become happier throughout the class. This research was conducted to characterize the literacy process of students with right and left brain dominance. This investigation uses Moodle Learning Management Systems (LMS) with Set Top Box (STB) storage. This researcher's learning media is a Set Top Box (STB), which contains content, modules, and quizzes based on a local network or not connected to the internet...

Keywords: Moodle; Set Top Boxes; Learning Management Systems; STEM Education; Game Approach;

1. INTRODUCTION

Improving the quality of each kind and degree of education is one of the national development goals within the framework of enhancing the quality of human resources. In order to assist education, the government always endeavours to pay close attention to the quality of educational resources, including the learning curriculum.

Using the game approach to teach a topic is one way to capture students' interest. By using the game strategy, pupils are happier throughout the class. Science, mathematics, and second language acquisition are three areas where games may be more successful than traditional media, according to comparative media studies (Mayer, 2019). With the worldwide proliferation of digital games, there is an increasing need to specify the degree to which games and their components may be used for learning and teaching (Adukaite et al., 2017) (de Lope et al., 2017). This research investigates the usage of the digital educational game Kahoot and validates the premise that the game may increase student engagement and learn in conventional lecture-based classrooms (Bawa, 2019). The results indicate that gamification techniques boost students' interest in class and their desire to achieve (Bicen & Kocakoyun, 2018). Positively motivating is the effect of a gamified educational method on student engagement and the link

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between engagement and academic success in the classroom (Çakıroğlu et al., 2017). From the educator's viewpoint, gamification's impact on student engagement led to an increase (Ding et al., 2018). The trial findings revealed a 25% increase in student motivation and a 26% reduction in the dropout rate (Hassan et al., 2021) (Aldalur & Perez, 2022). The gamified flip-class environment thrived in fostering the fundamental psychological demands of SDT: competence, autonomy, and relatedness (Zainuddin, 2018). Gamification has been found to increase student enthusiasm and involvement (Rosa-Castillo et al., 2022) (Aldiab et al., 2019). However, the reported study on gamification needs more progress in identifying the cognitive, motivational, emotional, and social processes underlying learning using educational computer games.

The right brain tends to be spontaneous, free, unorganized, intuitive, creative, and passionate about art. In contrast, the left brain tends to be rational, structured, logical, critical, and adept in mathematics. The two inclinations in the function of the brain's hemispheres will alter and cause the process of solving contextual issues that may uniquely test each individual's mathematical literacy. Each area of the brain functions according to its purpose and mode of operation for people to maximize their potential. These sections assist one another in coordinating information so that a single unit is produced in an action, treatment, or thinking. Students with left-brain dominance tend to excel in analytical and logical thought processes but struggle with interpersonal relationships. In addition, their right ear is often sharper, and their right hands and feet are sharper than their left hands and feet. They possess rational, analytical, reality-based, factual, procedural, practical, and organized skills. On the other hand, right-brain dominant pupils tend to have the disposition of individuals skilled at getting along with others but have difficulties absorbing technical information. His skills include conceptual, humanistic, visionary, emotional, spiritual, and intuitive.

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The balance between the right and left hemispheres of the human brain remains a topic of dispute in the fields of brain research and neuroscience. Multiple studies have shown that individuals favour using one side of their brain over the other. Some experts also contend that the left brain is more advantageous in organized tasks, such as mathematics, which involves

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several ideas and computations. Student problem-solving abilities must be taught (Xu et al., 2022) (Louw & Deacon, 2020) . Problem-solving skills pertain to a student's capacity to comprehend difficulties, which often involve word problems, build mathematical models of known problems, create strategies, and answer non-routine inquiries (Lange et al., 2021). Problem-solving requires excellent mathematical communication abilities, interaction among students, and interaction between students and professors. According to several research on problem-solving skills, students of all grade levels must engage in problem-solving practice in order to meet learning goals (Shettar et al., 2020) (Winkler et al., 2021) (Shettar et al., 2020) (Elaby et al., 2022)(Lecorchick et al., 2020) (Molnár et al., 2022) (Kanamori et al., 2023) (Castronovo et al., 2022) (Ndawo, 2021). However, based on these investigations, more is needed about the problem-solving skills of early childhood pupils. The predominance of the left hemisphere of the brain significantly impacts pupils' learning, problem-solving, and cognitive processes. Therefore, it is vital to undertake studies to determine kids' problem-solving skills in early infancy.

There are several significant study findings about the cognitive significance of brain dominance. In the latter few years of the 20th century, neuroscience started demonstrating the significance of brain or hemisphere integration for learning. Effective. This article examines many examples of fifth-grade (10-year-old) children with a dominant right hemisphere (visual) learning preference who demonstrate significant gains in language and arithmetic abilities while solving problems utilizing visually rich computer media such as MicroWorlds. In addition, the findings of Niekerk's study indicate that pupils with a dominant left brain prefer to use analytical, logical, linear, and systematic techniques. Students with a dominant right brain prefer visual, inductive, random, and divergent techniques. To generalize the phenomena, however, it is currently impossible to determine how brain dominance influences cognitive qualities, such as literacy. Therefore, we performed a qualitative study with this observer. Based on the preceding description, we performed a study to characterize the literacy process of students with right-brain and left-brain dominance.

Experts regard play as one of the environmental stimuli that promote optimal brain development in youngsters. Your child can maximize all of his potentials via play. Parents play a significant part in selecting appropriate play activities based on the child's developmental stage. We know that the differences between the left and suitable brain functions result in distinct personality traits, attributes, and skills. The most significant portion of the human brain, the cerebrum, is responsible for processing all intellectual tasks, including the capacity to think, reason, recall, envision, and plan for the future. The cerebrum is split into the left and right hemispheres, or the left brain and right brain, respectively. Each hemisphere has a distinct purpose. The left brain controls Intelligence Quotient (IQ) functions such as differences, numbers, writing, mathematics, and reasoning. Similar in neatness, structure, analysis, mathematics, and step-by-step approach. Left brain memory is transient (short-term memory). In the meanwhile, the right brain is responsible for the development of emotional intelligence (EQ). For example, they are socializing, communication, human connection, and emotional regulation. This right brain also contains the intuitive ability to feel, mix, and express oneself physically via singing, dancing, drawing, and various other creative activities. Correct brain

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memory is extensive (long-term memory). The issue is that our education system is still focused on growing just the left brain; the growth of the right brain does not get a significant amount of attention, even if it is only a tiny amount. Of scholarly material. The study title is "Game Software to Detect the Dominance of Right Brain and Left Brain Development in Children Aged 4-5 Years Who Use Android."

The demand for knowledge is crucial in this age of globalization and technological advancement. Thus bringing about several lifestyle adjustments. In addition, this information includes the speed, accuracy, and precision of the information acquired. Rapid advancements in science and technology, particularly computer technology, play a crucial role in daily life. The rising usage of smartphones, particularly those based on Android, is one of the developments. After the combination of computer technology and mobile technology, use is expanding. Mobile technology is a phrase used to define communication-supporting applications on tiny, portable, wireless devices (Dobashi et al., 2022). Mobile technology has integrated itself into our everyday lives. Most individuals use mobile phones, personal digital assistants (PDAs), and similar devices to connect through voice, check email, and other technologies. In recent years, the number of online learning materials accessible via massive open online courses and learning management systems has increased significantly (George & Lal, 2019). This research investigates the teaching of 21st-century competencies through online academic courses (Shwartz-Asher et al., 2022).

Information technologies and telecommunications that are inexpensive and simple will reduce the spatial and temporal limits that have hampered the education industry. Some of the logical consequences include: (1) students can easily take learning materials anywhere without being limited by place or time; (2) students can efficiently study and discuss with experts or experts in their field of interest; and (3) students can easily take learning materials in various parts of the world without being dependent on where they study. In terms of cost, the readiness of information technology infrastructure, society, and rules that enable the continuation of e-learning, these various potentials continue to face obstacles. E-learning is information technology development that may be used as a learning medium. E-learning is an invention that may be exploited in the learning process, not only for the distribution of learning materials but also for developing student competencies in various areas. Through e-learning, students actively watch, perform, and receive content explanations from instructors. Material for instruction may be virtualized in several forms to make it more engaging and dynamic, encouraging students to continue learning. Implementing electronic learning (e-Learning) is crucial because it envisages that it would transform traditional learning patterns into digital learning patterns or learning ideas carried out via electronic media networks. Moodle is today's most extensively used electronic learning paradigm (Modular Object-Oriented Dynamic Learning Environment). As a learning management system, Moodle is one of the open-source software programs utilized. It is more adaptable, user-friendly, and handy for motivated pupils. This combination of conventional instruction and modern technologies may increase the learning experience. This web-based online education benefits kids and instructors during the Corona pandemic lockdown (M. Sharma & Arora, 2020). In recent years, colleges and other businesses have used learning management and e-book systems to facilitate distant learning

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(Dobashi et al., 2022). First, the Moodle online learning system should provide students with various online learning possibilities that encourage creative cooperation. Second, a future teaching-learning operations manual must be established so that the Moodle-based class model can be utilized successfully in classroom settings to foster creative cooperation (Kim et al., 2019). The Moodle Workshop feature reviews generated prototypes and projects through video (Arce et al., 2022).

Learning Management Systems (LMS) are fundamental to education (Hachicha et al., 2021). Most universities in Saudi Arabia (about 90%) utilize Blackboard LMS for their teaching and learning activities (Aldiab et al., 2019) (Rosa-Castillo et al., 2022). While learning management systems (LMS) contain unique tools for transmitting and evaluating information, their capacity to engage and evaluate students deserves more excellent study (Gamage et al., 2019) (Cook & Babon, 2017). The LMS will create a series of objective tests (Sullivan, 2016). Learning Management Systems (LMS) have become increasingly significant in online education because they provide a flexible integration platform for organizing vast quantities of learning content and developing efficient communication channels between instructors and students in both directions (Paneque et al., 2023). Basic Learning Concepts Using E-Learning and Virtual Laboratories the fundamental principle of learning using LMS is e-learning development model learning. LMS, or Learning Management System, is software or software used to manage (for administrative reasons) documentation, materials and training instructional materials, as well as reporting on online teaching and learning activities (connected to the internet). Everything is completed online. LMS is software used to develop web-based online lecture materials and to manage learning activities and their outcomes. LMS Selection Best Practices, LMS is a software program that automatically administers learning activities. Integration of learning management systems is a relatively recent teaching tool. LMS is a web-based software that consists of applications that include electronic tools such as discussion portals, files, electronic mail, announcements, evaluations, and multimedia components. LMS gives access to student-centred learning systems, enhances accessibility/ability to access assessment and evaluation capabilities, and enhances the administration of learning/course material and administrative activities. This algorithm automatically estimates learning styles and cognitive attributes using LMS log data, educational theory, and literature-based methodologies (Lwande et al., 2021). The suggested architecture is fault-tolerant since the web server, database, and storage are redundant (David et al., 2022). The evolution of internet-based computer technologies now focuses on a straightforward and quick system application procedure. Cloud computing is a response to the advent of restrictions such as restricted or wasted computer resources, which cause delays in certain computing operations. The resources required for data storage and device installation are minimal and expensive. Cloud computing is one example of the evolution of information technology; the appropriate technology will significantly aid users in completing a task. One of the technologies that must be implemented is centralized and flexible storage media. The Next Cloud platform is one of two open-source web-based storage media software; this program provides excellent network-based data management capabilities and processes. This technology benefits an agency or institution's everyday tasks, including papers, mainly digital documents. A Set Top Box is one device that may be utilized as a cloud server

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(STB). STB is a tiny hardware device with a CPU, RAM, hardware port, and the Android operating system on many PCs. STB is only known to be used to view or play streaming media such as YouTube, movies, and others. Even though the STB may be customized to function as a cloud server. Although the STB will be less powerful than a PC server, we may change it without considering the cost since it is far less expensive.

People are increasing their use of Set-top boxes (STB) by using them as television media, watching movies, game emulators, and others. However, they are not maximizing the Set-top box (STB) device as a proper Android STB device. As the number of internet users and Set-top box (STB) users increases, people are increasing their use of Set-top boxes (STB) by using them as television media, watching movies, and game emulators, among other uses. With this research, people can maximize Set-top box (STB) devices with different functions than their everyday use by transforming them into a cloud server, and the public can use a set-top box (STB) as a personal storage server with assured security using only set-top box (STB) devices. Employing a Cloud Server The community may replace the Set-top box (STB) device at a minimal cost and with relative ease. The Set-top box (STB) device can serve as a personal storage medium for the community. The set-top box (STB) into a cloud server, public may access personal data using a Set-top box (STB) device that has been converted into a cloud server, and the public can use a Set-top box (STB) device as a tiny flexible pc that is more cost-effective than other mini pc. Through this Final Project with the title "Utilization of Used Set top Boxes (STB) as Data Storage Media Performed Using the Samba Method in Data Exchange among Users", the author can inform the public that the use of Set-top boxes (STB) as cloud servers has many advantages, including the storage of personal data, the creation of a mini server, and the transformation of a Set-top box (STB) device into a mini PC similar to a conventional computer.

2. METHODOLOGY

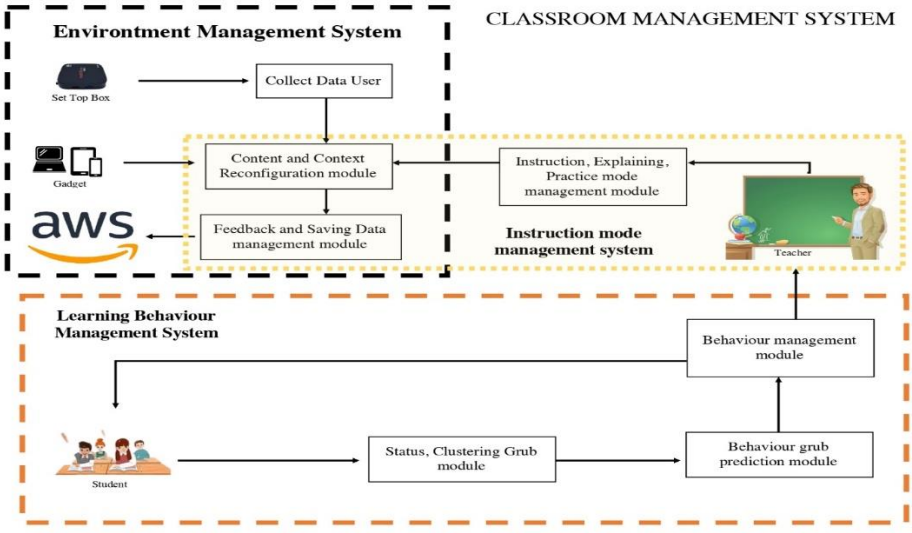

Figure 1: The research method through the problem approach

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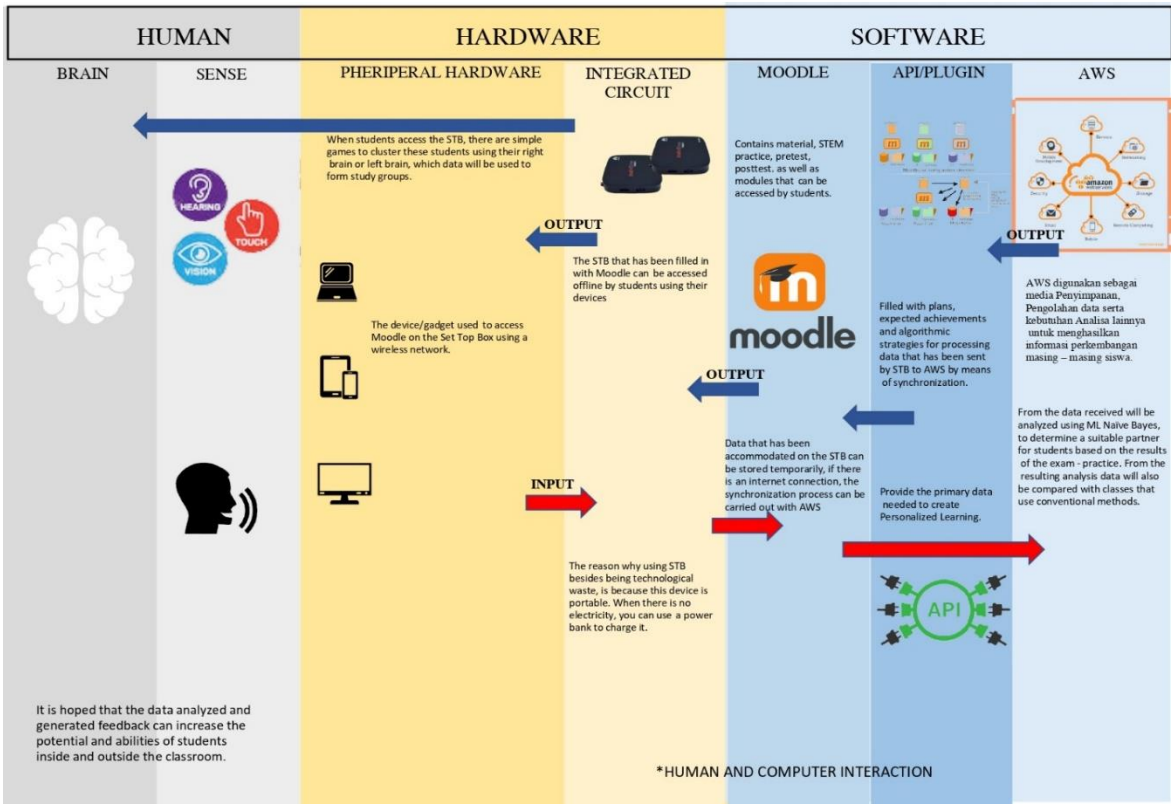

Figure 2: Illustration of a research method through a problem approach

This research employs the Information Architecture Framework methodology. Based on the architectural framework, the first stage is to characterize the current challenges, followed by an analysis and design using the Framework method, which starts with establishing the system's scope, which encompasses all required data, processes, and settings. As well as proceeded with the production of a business model design, i.e. system management as represented by Use Case Diagrams, and the building of an information system model using Class Diagrams, Activity Diagrams, and Sequence Diagrams. Creating a technology model that describes the design of menu interfaces, dialogue boxes, and forms must be accomplished at this stage. Implementing an E-Learning information system using customized Moodle (Modular Object-Oriented Dynamic Learning Environment) software is the last step (Figure 1). Concept, Design, Material Gathering, Assembly, Testing, and Distribution. This study's supplementary instruments included interview guides, tape recorders, video assistance software, user feedback on the STB, and observation sheets. Researchers employ supporting tools to collect data on student and instructor activities in implementing OER learning activities utilizing the STB (Figure 2). Researchers have chosen a Set Top Box as their learning platform, which comprises resources, modules, and quizzes based on a local network or not linked to the internet. Also, remember that this grub is quickly bored and can rapidly access this knowledge to comprehend the subject so that the task may be performed as fast as possible. The gadget has concise use instructions and a temporary data storage or user history record. We chose to build an ecologically

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sustainable gadget, user-friendly and powered by renewable energy that can be accessed over a wireless network by a computer or other smart device.

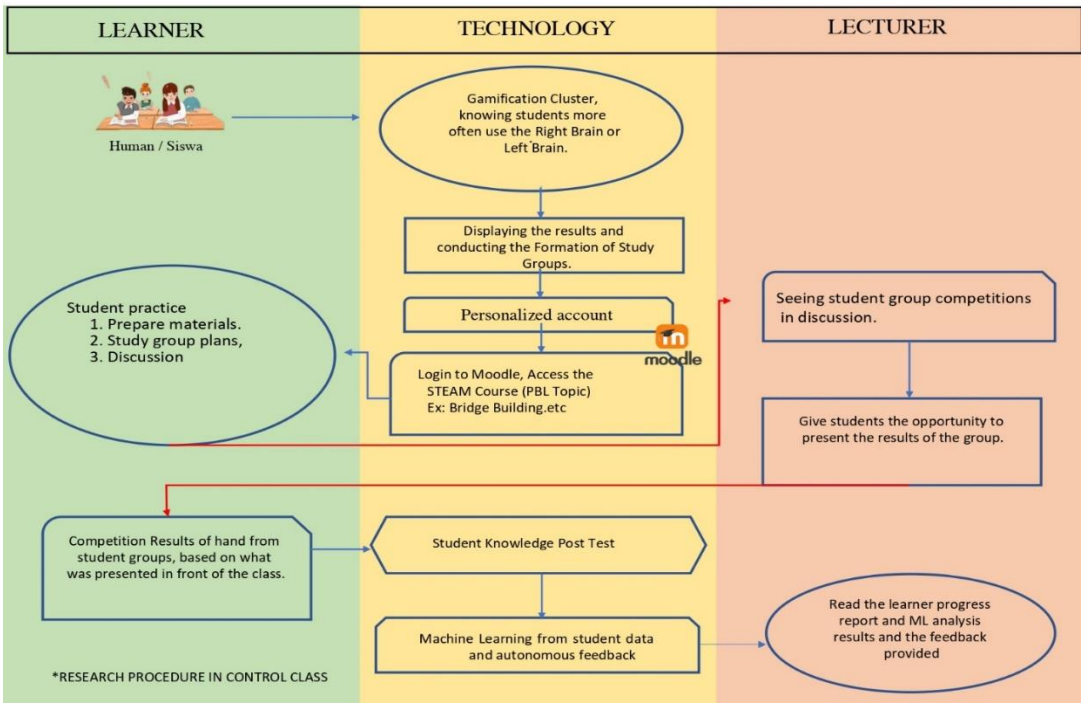

Figure 3: Thinking Framework

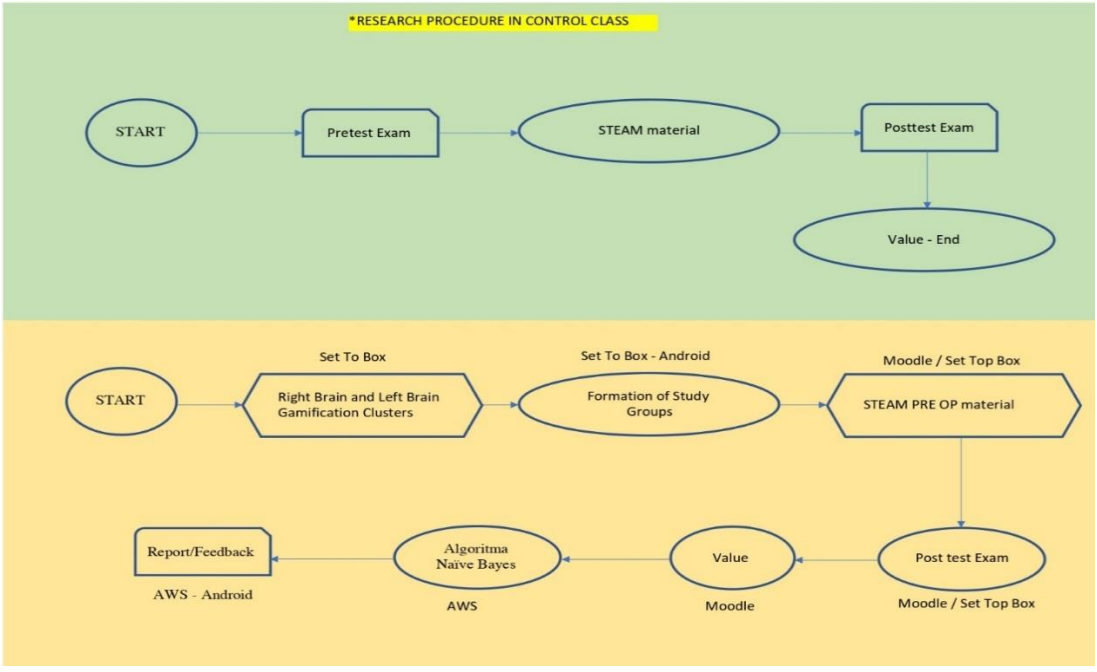

Figure 4: Research flow

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In line with the goal of this study, descriptive quantitative research is used to present an overview of communication abilities and challenges that occur in nature among right-brain dominant or left-brain dominant Elementary School Students (SD). This research included 140 sixth-grade primary school pupils from Palengaan District, Pamekasan Province. The research activity in the control class (Figure 3).

This Project aims to assess self-regulation learning, use cluster gamification, organize study groups, including students in all stem learning materials on learning devices, and administer a post-test (figure 4). By partnering with the STB on cloud technology, the efficiency of media processing, storage, and accessibility can be ensured without having to worry about data loss.

Table 1: Moodle Evaluation Plan

Stages	Subject	Amount
One-on-one evaluation by experts	Material expert or field of study. Instructional design expert Media production & graphic design specialist	1-7 1-7 1-7
One-on-one evaluation by students	Learners	1-140
Small group evaluation	Learners	1-2
Field trials	Learners	1-140

3. RESULTS AND DISCUSSION

Using set-top boxes as Moodle-based e-learning media emphasizes the 5R concept of reusing technological waste for its advantages. Reuse, Recycle, Repair, Reject, and Reconsider is the 5R concepts. Reuse refers to maximizing the advantages of device trash so that it may be reused, recycling refers to recycling, and Repair refers to enhancing the functioning and repairing multiple broken components. To reduce manufacturing waste, refuse entails limiting the purchase of used and new electronics. In addition, according to what has been said earlier, the implementation phase follows the planning phase. An early set-top box's operating system was made of pulp stone. Pulstone is a bespoke openwrt with a user interface resembling Android (Figure 5). So that it may be used as a server, the next step is to root or unlock the set-top box and replace the Pulstone operating system with Armbian Linux and the Ubuntu 20.04 distribution (Figure 6).

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Figure 5: Pulpstone Display

Figure 6: Armbian Linux Ubuntu 20.04 Display

After the procedure of operating system migration is complete. The subsequent step is thus to install PHP version 7.4, MariaDB, and nginX.

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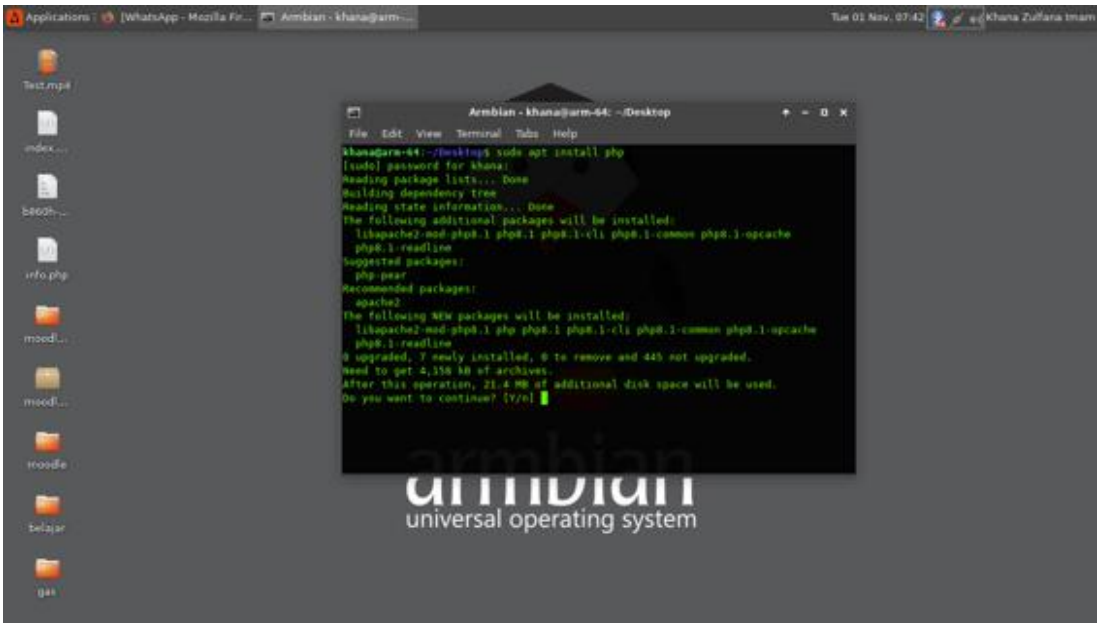

Figure 7: Installing PHP

Following the installation of PHP and MariaDB, the next step is to install Moodle (Figure 8). It is possible to install moodle on STB both directly and indirectly. Direct indicates that Moodle may be accessed directly via the set-top box's browser. In contrast, indirect installation involves installing Moodle on a different device using the IP address from the set-top box. The "config" command displays the IP address of the set-top box.

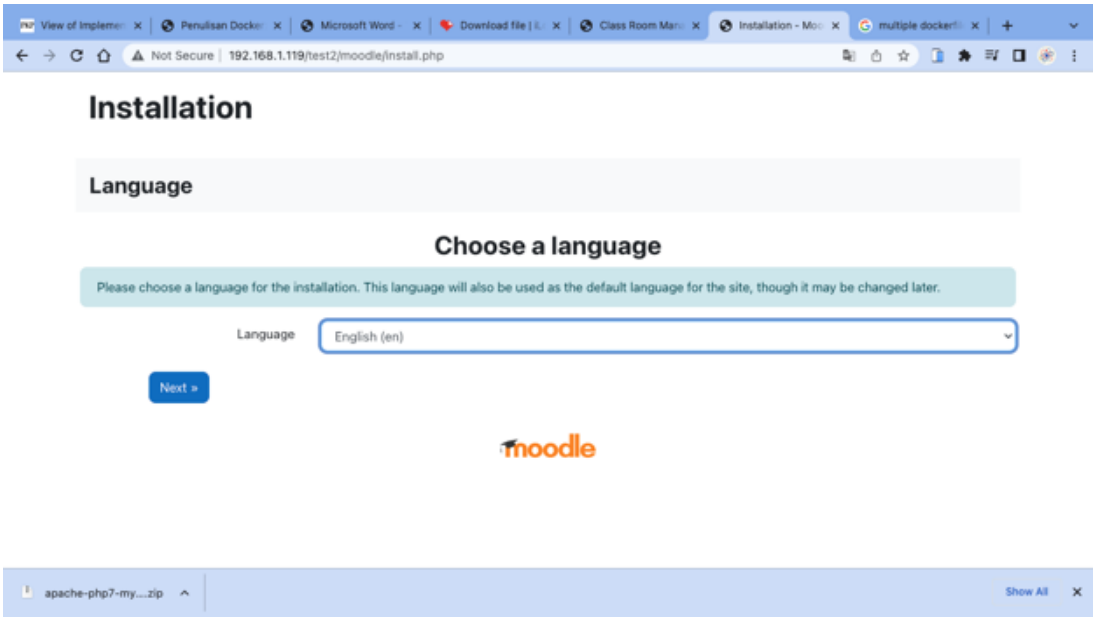

Figure 8: Moodle Installation

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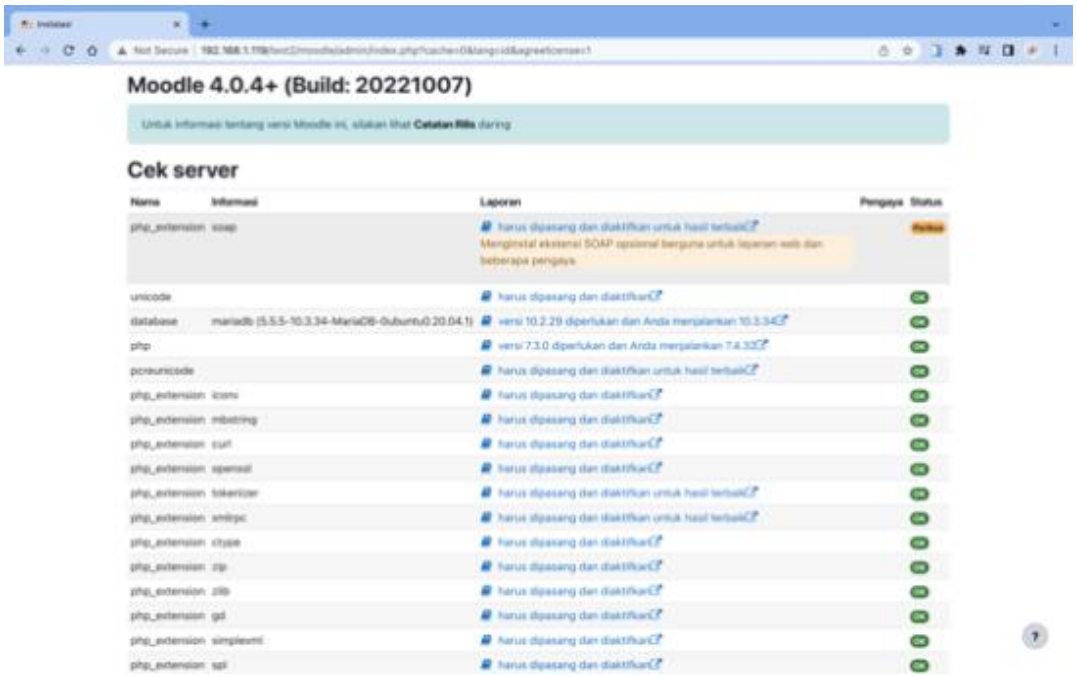

Figure 9: Extension Verification Pages

The user is prompted to choose the default language or the language Moodle would use by default. Pay close attention to the PHP extension added while installing Moodle (Figure 9). This is because many extensions must be installed. Some of the extensions to be installed are shown as follows (Figure 9). The installed Moodle interface appears as follows (Figure 10).

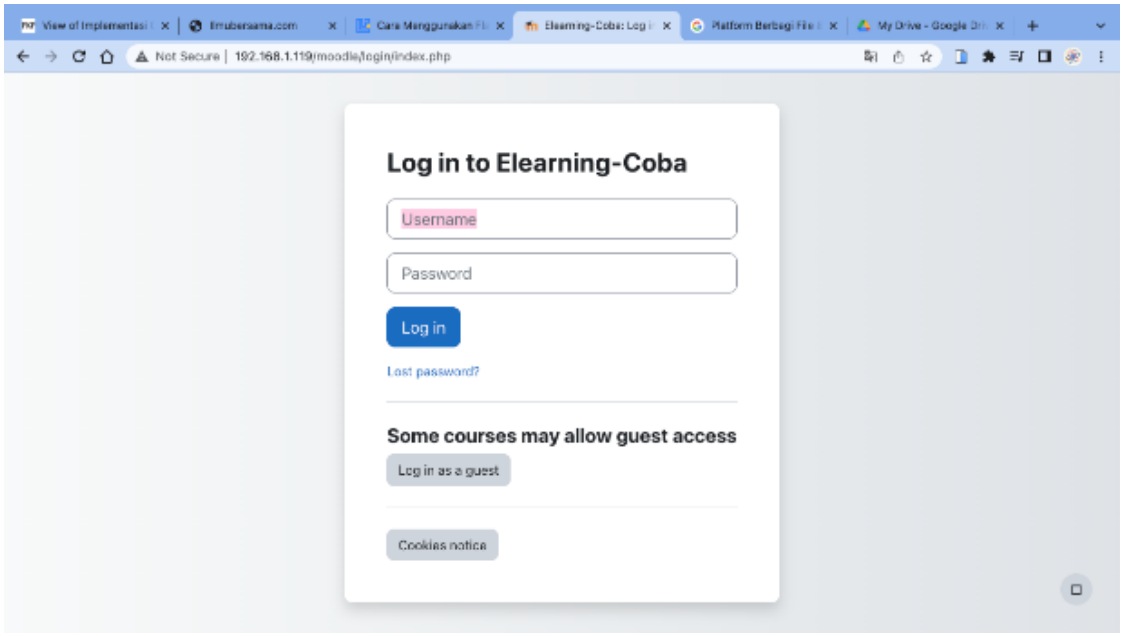

Figure 10: Display for Elearning Login

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There are many factors to consider before installing Moodle. This is the value of the slash parameter for each web server. The slash parameter must be deactivated in nginX to identify CSS and javascript files. Otherwise, the view will seem as follows (Figure 11). Disable any argument by clicking the following (Figure 12). Following the completion of the device installation phase comes the testing or trial phase.

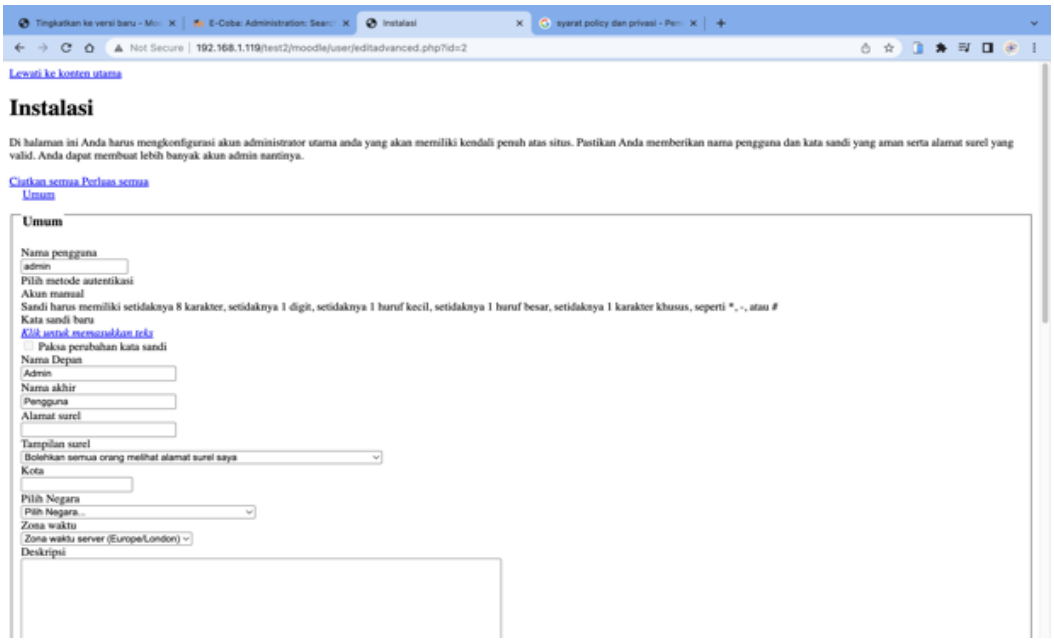

Figure 11: Moodle Slash Arguments

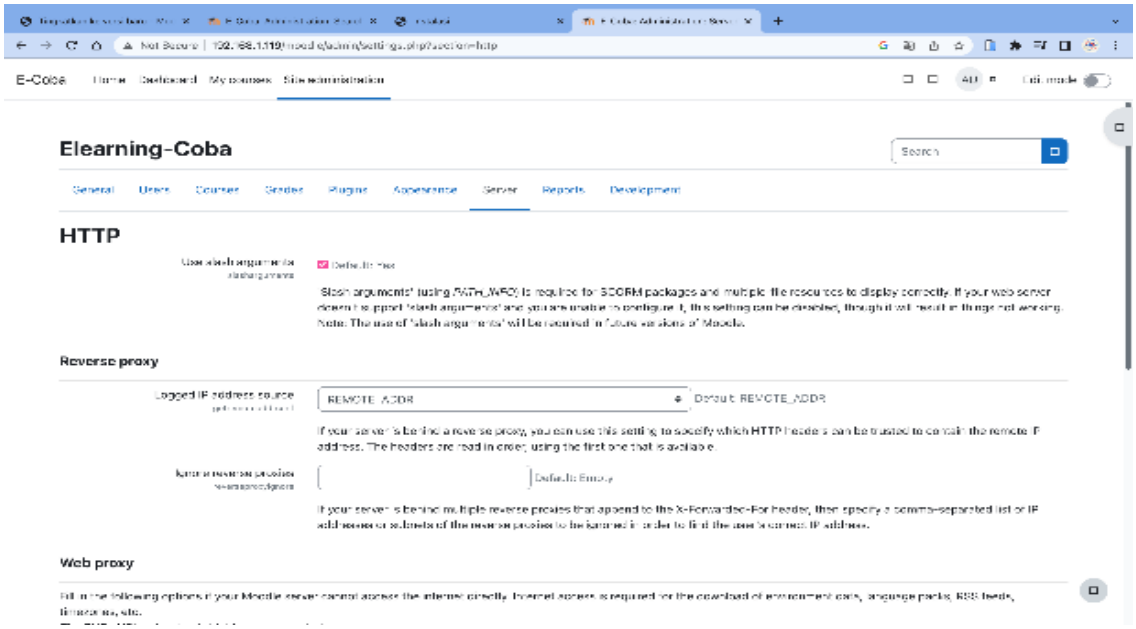

Figure 12: Disable Moodle Argument

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Ten material experts and ten media experts, acting as validators, used a questionnaire to assess the Moodle product using the STB storage in order to generate instructional material products that are of high quality and conform to requirements. The following is the final validation result from 10 media and ten material experts, based on the performed validation (Table 2).

Table 2: Results of the validation of material experts and media experts

Validator Number	Material Expert	Media Expert
1	80,02%	80,34%
2	85,27%	82,62%
3	89,37%	78,52%
4	83,23%	81,62%
5	91,34%	82,82%
6	81,67%	80,21%
7	83,97%	84,72%
8	86,42%	87,56%
9	85,72%	81,48%
10	87,38%	83,78%
Average	85,44%	82,37%

The findings of the validation of material experts earned a final score of 85.44%, placing them in the highest feasible group. In comparison, the results of the validation of media experts received a final score of 82.37%, placing them in the same category. After validation, material specialists provided the following recommendations: (1) Check the appropriateness of the content; (2) Record the reference source; and (3) Add instructions on how to utilize the Harry King nomogram. Following validation, media experts provided the following suggestions: (1) The need to add instructions for use/Learning Guide; (2) Decorative graphics that do not match the content are minimized; (3) Provide information about courses in RPKPS; (4) Provide a description of the material; and (5) Tabs were created for each material topic.

Table 3: Evaluation results from teachers and students

User	Very Practical	Practical	Pretty Practical	Very Impractical
Teacher	2	5	0	0
Student	46	71	23	0

Practical learning goods enable instructors and students to effectively and practically empower media or learning products in teaching and learning activities effectively and practically. Instruments or techniques for monitoring the execution of learning implementation plans, surveys from teaching staff and students on the media or E-learning products generated provided the data for the practicality analysis (Table 3). Convenient is the conclusions gained regarding the practical viability of a medium. 32.60% of the total number of users, 147 individuals, are practical. 51.7% of the total number of users, 147 individuals, is efficient. 15, 65 % of the number of users is 147 individuals, which is unfeasible. 0.0% of the users are 147 individuals (Figure 13). According to this feedback, it is known that users find this Moodle useful for learning. Feedback is crucial since it may quantify a user's success rate (Molin et al., 2020) (Romero et al., 2021) (West & Turner, 2016). The application influences the teaching-

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learning process, skill development, and academic success as evaluated by student test results (Guardia et al., 2019). Participants' perspectives about gamification were also gathered via interviews with high marks (Huang & Hew, 2018).

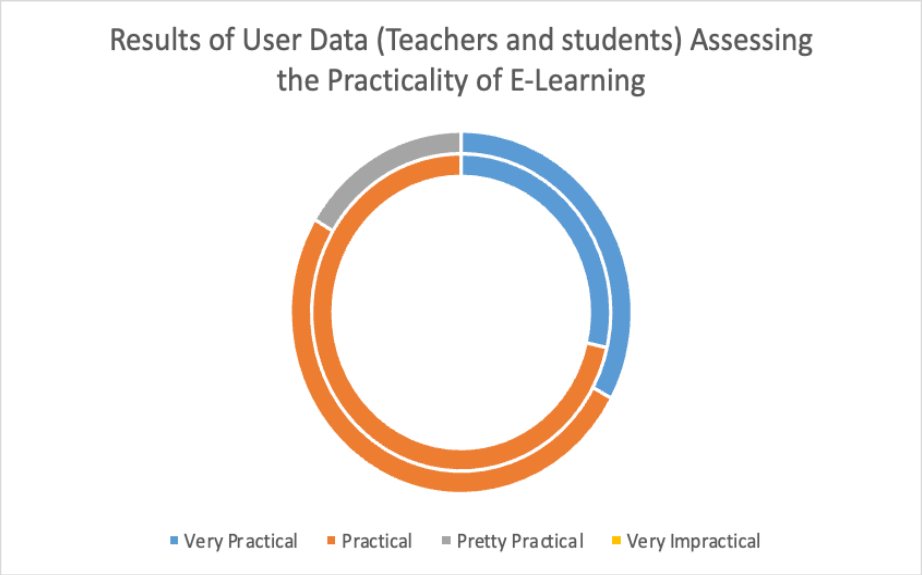

Figure 13: Results of User Data (Teachers and students) Assessing the Practicality of E-Learning

When students visit the STB, basic games cluster them according to their right- or left-brain dominance; this information is then utilized to construct study groups. 58 pupils out of 140 were identified as right-brain dominant, whereas 82 individuals were identified as left-brain dominant (Figure 14). When defining the right and left brain group examinations, it was discovered that pupils had upbeat attitudes. This is consistent with the notion that students are engaged in friendly contests while answering exam questions and are exposed to repeated instructional cycles, which might explain the substantial disparities between e-Quiz II and III (Zainuddin et al., 2020). Online quizzes have been proven to be an excellent method of instruction and evaluation (Jaeger & Adair, 2017) (Martins, 2017) (Sancho-Vinuesa et al., 2018). High learning gains suggest that gamification may be an effective strategy for promoting STEM curricula (Ortiz-Rojas et al., 2019).

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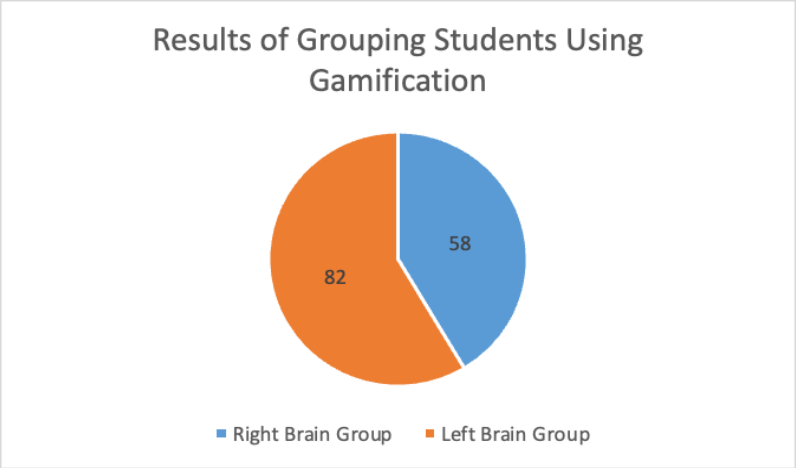

Figure 14: Results of Grouping Students Using Gamification

After showing the findings and generating study groups, namely right-brain and left-brain study groups, it is essential to log in to Moodle, access the STEAM Course, and complete the assignment (PBL Topics). Students must create resources, study group strategies, and have discussions for this level. An explanation of communication abilities in terms of how the dominant brain operates yields the following results (Figure 15). In the right-brain dominant group, 36 students acquired written communication abilities, whereas 22 individuals acquired spoken communication skills (Figure 15). In contrast, 53 students acquired written communication abilities in the left-brain dominant group, and 29 individuals acquired spoken communication skills (Figure 15). Some resources in scientific education involve proving theorems that need comprehension to prevent misunderstanding while evaluating questions, synthesizing questions, solving issues, recognizing mistakes that may arise when addressing problems, and amending if errors occur.

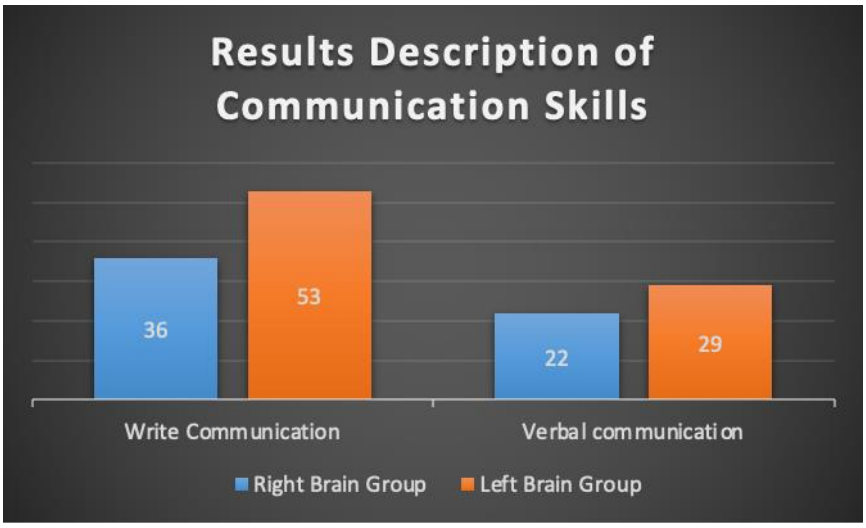

Figure 15: Results Description of Communication Skills

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The results of written communication assessments in scientific classes indicate the left brain group's capacity to communicate orally and in writing. 1) have strong language abilities, 2) Deliver solutions or explanations that are consistent, orderly, cohesive, mathematical, logical, reasonable, objective, Critical, and congruent with the facts. 3) Possess proficient reading, writing, and arithmetic abilities. 4) Possess solid analytic abilities. 5) Prefers explanations, 6) can recognize the root causes of issues, and 7) can consider and determine remedies. Communication Expertise, The right brain group in writing and speech comprises the following: 1) Possessing intuitive solid, creative, imaginative, artistic, and rhythmic skills. 2) Possessing a more creative, comprehensive, and unified mode of thought. 3) Answers or explanations are provided in a disorganized, subjective, and vague manner. 4) Be able to interpret nonverbal clues. 5) Capable of visualizing emotions 6) Quicker in comprehending the whole problem. In this phase, the researcher discussed the student group competition and allowed students to share their group's achievements. Based on the information provided to the class. The left brain group possesses the following characteristics: 1) excellent verbal skills for communicating the outcomes of discussions; 2) the ability to communicate answers or explanations in a consistent, orderly, systematic, logical, rational, objective, critical, and factually appropriate manner. 3) Capable of analyzing problems effectively. 4) Greater emphasis on reasonable explanations 5) Capable of identifying an issue's primary or fundamental cause; 6) competent in evaluating and choosing remedies and conclusions. The right brain group consists of 1) The aesthetics of media displays are inventive and original. 2) Capable of providing several answers or explanations. They are neither ordered, linear, nor comprehensive when providing responses or explanations. 4) The right brain communicates nonverbal clues while explaining or responding to participant inquiries during presentation delivery. 5) Be able to envision emotions such as an appreciation for audience members throughout presentations. 6) Right-brained pupils can comprehend the issue holistically and integrate more rapidly during the presentation.

After presenting, students complete the post-test. The following questions comprise the post-test: 1) Mention the Formula for Force (C1). 2) Cite instances of styles from daily life (C2). 3) Sort the solar system's planets by the number of their satellites (C3). 4) From his home to school, Anton rides his motorbike at a speed of 4 km/h, whereas Tony travels from school to Anton's home at a speed of 5 km/h. When will they meet if Anton's residence is 10 kilometres from his school? (C4). 5) Dayat travels to school at a pace of 4 km/h if the distance between his home and school is four times that between his home and Faisal's. How long does it take Dayat to reach school, given that the distance from Faisal's home to school is 6 kilometres? (C5). 6) Construct a Parallel Series Electrical Diagram using wires, six batteries, ten lights, and three switches (C6).

Table 4: Of Student Post-test Results

Post-test questions	C1	C2	C3	C4	C5	C6
Right Brain Group	53	49	44	41	38	36
Left Brain Group	75	73	62	61	64	51

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From the results of the post-test shown in Table 4, it can be deduced that the number of students in the right and left brain groups who replied correctly was equal. The percentage of accurate responses for the C1 right brain group was 91%, and for the left brain, the group was 91% (Figure 16). 84% of C2 right-brained individuals compared to 89% left-brained individuals (Figure 16). 75% of the C3 right brain group and 75% of the left brain group (Figure 16). 70% of the C4 right brain group and 74% of the left brain group had a right brain (Figure 16). The C5 right brain group scored 65%, whereas the left brain group scored 78% (Figure 16). 62% of C6 right-brained individuals and 62% of left-brained C6 individuals (Figure 16). The cognitive features of Grade 6 Elementary School Students in the Palengaan District of Pamekasan's Pamekasan Regency indicate that 140 individuals are more prominent in the left brain group. Using PBL, the findings of studies conducted with this moodle, the right brain group, and the left brain group indicate that interest in learning is increased. Participants improve not only their technical and practical skills but also their leadership and technical abilities to become better future members of society (A. Sharma et al., 2020). Some of the best practices, assessments and examples offered in this article will interest engineering design teachers and others desiring to provide an active learning educational experience for postsecondary students (Shekar, 2014) (Baudin et al., 2022). This strategy may also foster a pleasant learning environment, influencing student involvement (Zen & Ariani, 2022). Assisting educators in evaluating the performance of candidates individually or in groups on several assessment criteria, facilitating the attainment of the necessary knowledge, values, attitudes, and skills for ongoing education development (Goyal et al., 2022) (Du & Lundberg, 2021). PBL courses facilitate the development and improvement of these noncognitive abilities, shown by the impact of grit and growth mindsets on academic performance (Shanbhag et al., 2020). The study's findings indicate that the framework enables most students to analyze their projects' feasibility and break down their ideas (Menon & Poroor, 2020) (Corbacho et al., 2021).

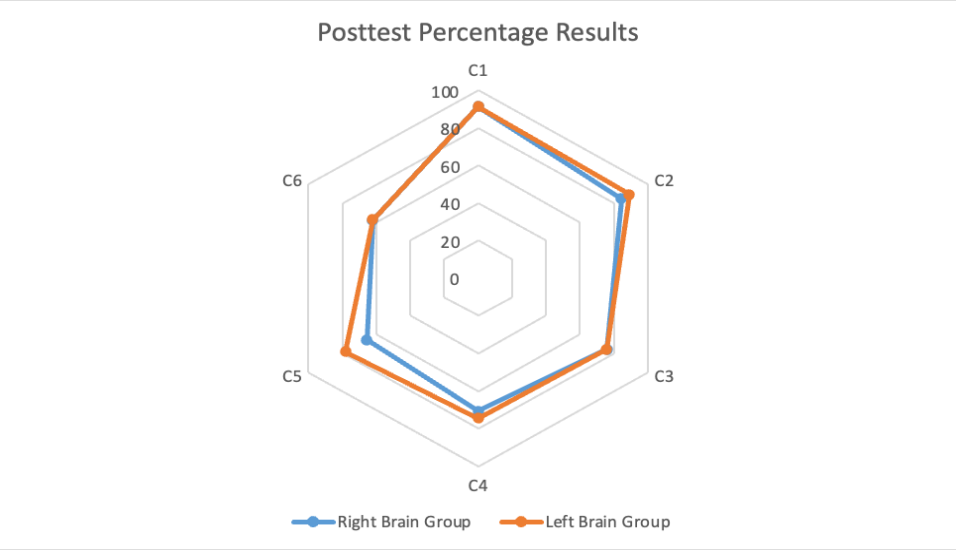

Figure 16: Post-Test Percentage Results

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4. CONCLUSION

According to study findings, the set-top box has a role that is far more valuable than its usage as an Android TV at home. The set-top box may also function as a server-capable minicomputer where the server may give the Moodle Learning Management System. This may serve as a substitute and recycle technical trash. Moodle-based educational game apps using STB storage to view right-brain dominance groups and left-brain dominance groups at SDN may assist in grouping students and instructors in instructing youngsters with a game that can determine which brain is dominant. The participants improve not only their technical and practical abilities but also their leadership and technical skills, enabling them to become better future members of society.

Written communication of the left brain dominant group is superior to that of the right brain dominant group, while spoken communication of the left brain dominant group is superior to that of the right brain dominant group. The results of the science written communication test revealed: a) Right-brain dominant group, who tended to work on the most accessible questions, had difficulty understanding the meaning of the questions but understood the concepts, were able to work on problems in the form of illustrations, and attempted to solve the problems in their way. b) The left-brain dominant group spends more time working on initial questions, can comprehend questions and ideas, can solve issues involving discovering solutions, and solves problems based on what the instructor teaches. The results of the oral science communication test revealed: a) The right-brain dominant group tended to attempt to explain solutions by providing detailed information; they were not fluent or wordy when explaining the intent and purpose of the questions; and they considered questions with multiple solutions. b) The left-brain dominant group tends to be cautious when expressing issue-solving, is adept at describing the problem's goal and purpose, and describes the problem with a single solution.

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