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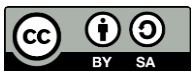

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The Impact of Scratch Programming on Improving Students English Skills

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Abstract

This study examines the influence of Scratch programming on enhancing students' proficiency in the English language. The research was carried out for a duration of two years in five primary schools. It employed a quantitative descriptive approach, gathering data using online surveys from a total of 18 instructors. The findings suggest that the use of Scratch programming has a substantial positive impact on different facets of English competence, such as the acquisition of vocabulary, comprehension of instructional material, reading and writing abilities, and grammar skills. Teachers expressed a strong understanding of Scratch and noticed significant enhancements in their pupils' linguistic skills. The results endorse the incorporation of visual programming languages such as Scratch into school curriculum as a means to successfully augment English language education. Additional research is advised to investigate the long-term effects and optimal methods for incorporating Scratch into language learning environments.

Keywords: *Learner centered curriculum*

Introduction

In recent years, the incorporation of programming into educational environments has seen significant growth, with visual programming tools like Scratch becoming accessible and effective platforms for young learners. Scratch is a block-based visual programming language created by the Lifelong Kindergarten Group at the MIT Media Lab. It is specifically designed to introduce programming concepts through engaging projects like interactive stories, animations, and games. The intuitive interface and drag-and-drop functionality render it particularly appropriate for novices, such as primary school students (John, Kylie, Yasmin, Mitchel, & Natalie, n.d.). Scratch encourages active participation in programming, while also nurturing skills in computational thinking, teamwork, and creative expression. Furthermore, it offers learners the chance to engage with command

structures and logical sequences that reflect the organization of natural language, thus enhancing both coding abilities and language growth.

Language proficiency stands out as a vital skill in the 21st century. With the intensification of globalization and the prevalence of digital communication, the capacity to communicate effectively in English acknowledged as the global lingua franca has become essential (Rao, 2019). Proficiency in language skills broadens access to academic resources, promotes cross-cultural understanding, and creates global employment opportunities. In educational settings, language functions not merely as a topic of examination but also as a conduit through which students interact with various fields, such as computer science. The relationship between language acquisition and programming is especially clear in visual programming environments, where learners need to understand and utilize English-based commands and syntactic structures to create operational programs (Marcos & Esteban, 2016).

The application of Scratch in language education demonstrates potential in connecting technological skills with linguistic abilities. By necessitating that learners engage with instructions, analyze functional blocks, and create narratives, Scratch enhances the development of vocabulary, reading comprehension, and writing abilities. According to teachers, incorporating Scratch into classroom instruction has resulted in noticeable enhancements in students' English language skills, especially in vocabulary growth, comprehension of instructions, and grammatical application (Mikko & Päivi, 2022). This indicates that visual programming may function as a powerful educational resource for language teaching, particularly when it is integrated with communicative and constructivist teaching methodologies.

In light of this context, the primary inquiry driving this investigation is: In what ways can Scratch programming enhance students' English language proficiency? This investigation aims to examine the relationship between the utilization of Scratch and the improvement of language skills, concentrating on particular aspects such as vocabulary development, reading and writing capabilities, understanding of English-language directives, and grammatical knowledge. This study aims to explore the strategic integration of Scratch within language instruction, enhancing both technological fluency and linguistic skills in primary education settings.

Method

This study employed a quantitative descriptive research design, which is appropriate for identifying trends, patterns, and relationships in educational settings without manipulating variables. According to Sugiyono (2017), the quantitative descriptive method is suitable for analyzing the characteristics of a population or phenomenon by collecting numerical data through structured instruments. This approach allows researchers to obtain an objective understanding of teachers' perceptions of Scratch in enhancing English language

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skills. Participants and data collection method Context and Subjects The study was carried out in five primary schools located in Yogyakarta, Indonesia.

The schools were chosen using purposive sampling, adhering to specific inclusion criteria: (1) previous integration of educational technology in their curricula, (2) institutional support for innovative teaching practices, and (3) sufficient ICT infrastructure to facilitate Scratch programming. This selection method aligns with the principles of purposive sampling as outlined by Palinkas et al. (2015), highlighting the significance of selecting information-rich cases for comprehensive analysis.

This study involved 18 English teachers. Teachers were required to have utilized Scratch in their English instruction for a minimum of one semester to meet the inclusion criteria. The sampling targeted individuals with direct classroom experience in integrating visual programming into language learning, thereby ensuring the relevance and reliability of the responses

Implementation of Scratch Programming

Scratch programming was conducted over a six-month duration, featuring sessions twice weekly for approximately 45 to 60 minutes each. Educators adhered to a standardized instructional framework that incorporated Scratch activities alongside English language objectives, including the development of vocabulary games, the design of dialogue-based animations, and the composition of narrative storytelling in English. This integration embodies constructivist principles of student-centered learning and corresponds with prior research highlighting the significance of visual programming in improving digital and linguistic literacy (Sáez-López et al., 2016).

While a formal control group was not included, baseline assessments were performed at the program's outset to evaluate students' initial English proficiency. The results were analyzed in conjunction with teachers' end-of-program evaluations to ascertain perceived enhancements in language skills.

Data Collection and Validation of Instruments

The main data collection tool was a closed-ended questionnaire comprising ten statements assessed with a five-point Likert scale. The items focused on essential aspects including vocabulary acquisition, reading comprehension, grammar comprehension, and the frequency of Scratch usage.

The survey instrument was validated for content by three experts in educational technology and second language acquisition. The study was pilot-tested with five teachers who were excluded from the main sample. The feedback from this pilot contributed to enhancing the clarity and relevance of the items.

The instrument's reliability was established through Cronbach's alpha, resulting in a value of 0.87, which signifies high internal consistency (Tavakol & Dennick, 2011). Procedures for Data Analysis The surveys' data were analyzed through descriptive statistics, encompassing means, percentages, and frequency

distributions. The statistical techniques enabled the identification of prominent trends and patterns in teachers' perceptions regarding the effectiveness of Scratch. More advanced inferential techniques, including t-tests and ANOVA, were considered but not utilized because of the small sample size and lack of a control group. Future research utilizing larger samples may employ these methods to enhance causal analysis.

Finding

The respondents in this study consisted of a total of 18 teachers. The data collection in this study was done using online lifts that were shared with male and female teachers. There are 10 statements to be answered by the teacher and the results of the sample answers are summarized in the diagram below:

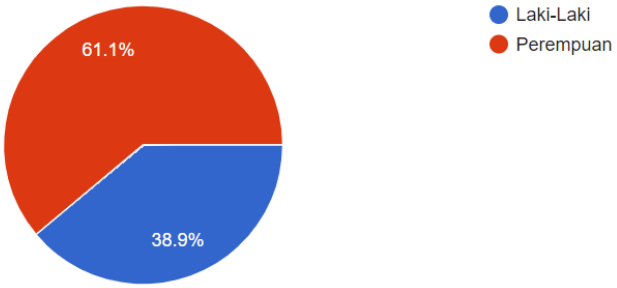

Figure 1. Gender Man and Women

The first statement about Scratch, partly of teacher states that the teacher knows about what is Scratch with a percentage of 87%. From the above data it can be concluded that the teacher knows what Scratch is.

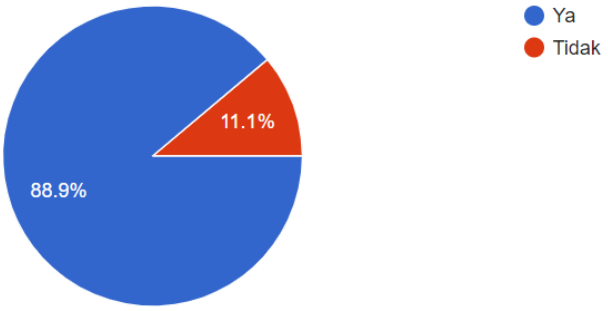

Figure 2. Teacher finds out what a scratch is

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Based on the data shown in Figure 3, asked very often, frequently, neutral, never, never how often to use scratch 38% of teachers answered very often 11% answered often 22% replied neutral 22% never, 5% replied never.

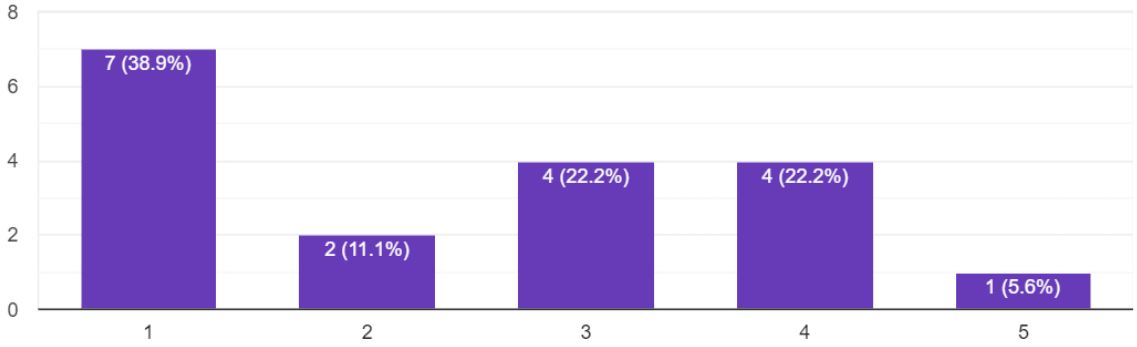

Figure 3. How Often to Use Scratch?

Based on the data shown in Figure 4, very frequently asked questions, often, neutral, never, never How often do you find new English vocabulary when using Scratch 44% of teachers answer very often, 11% answer frequently, 27% answer neutral,11% answer never, 5% answer never

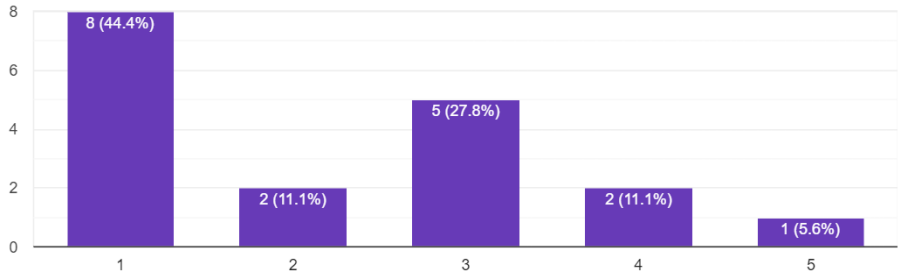

Figure 4. How often do you find new English vocabulary when using Scratch?

Based on the data shown in Figure 5, asked the question very much agree, agree, neutral, disagree, not very agree Do you feel you understand instructions and commands in English better after using Scratch 50% of the teachers answered very much agree, 27% agreed, 11% answered neutral, 5% answered no, 5% replied not very much agreed.

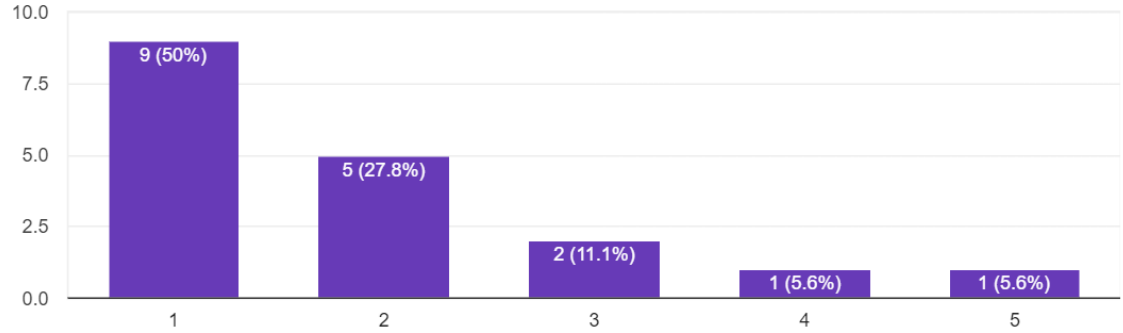

Figure 5. Do you feel you understand instructions and commands in English better after using Scratch?

Based on the data shown in Figure 6, the question was very helpful, helpful, neutral, not helpful, not very helpful. How often do you discover new English vocabulary when using Scratch of 55% teachers answer very often, 16% answer often, 11% answer neutral, 11 % answer never, 5% answer never?

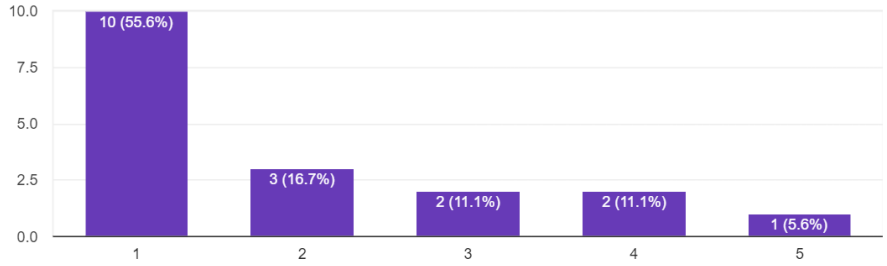

Figure 6. How often do you know the meaning of English words or vocabulary when using Scratch?

Based on the data shown in figure 7, the question was asked very increased, increasing, neutral, not rising, not increasing very much Do you feel that your English reading skills have improved after using Scratch by 38% teacher replies very improved, 27% replies increased, 27 % replies neutral, 0% replies did not increase, 5% replies never.

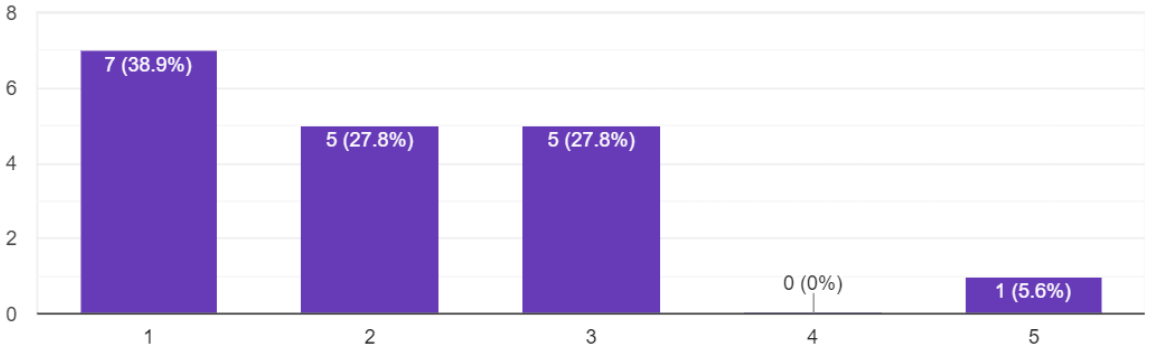

Figure 7. Do you feel that your English reading skills have improved after using Scratch?

Based on the data shown in Figure 8, the question was asked very increased, increasing, neutral, not rising, not very increasing Do you feel your English writing skills have improved after using Scratch? 38% of teachers responded very much, 33 percent increased, 22 percent responded neutral, 0% did not increase, 5% did not.

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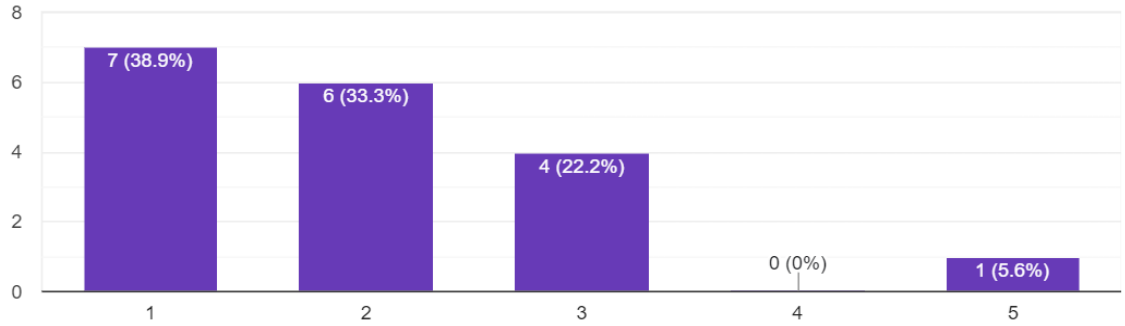

Figure 8. Do you feel your English writing skills have improved after using Scratch?

Based on the data shown in Figure 9, the question was very helpful, helpful, neutral, not helpful, not very helpful. Does using Scratch help you understand English grammar? 33% of teachers answered very helpful, 11% helped, 27% answered neutral, 16% did not help, and 11% replied not very helpful.

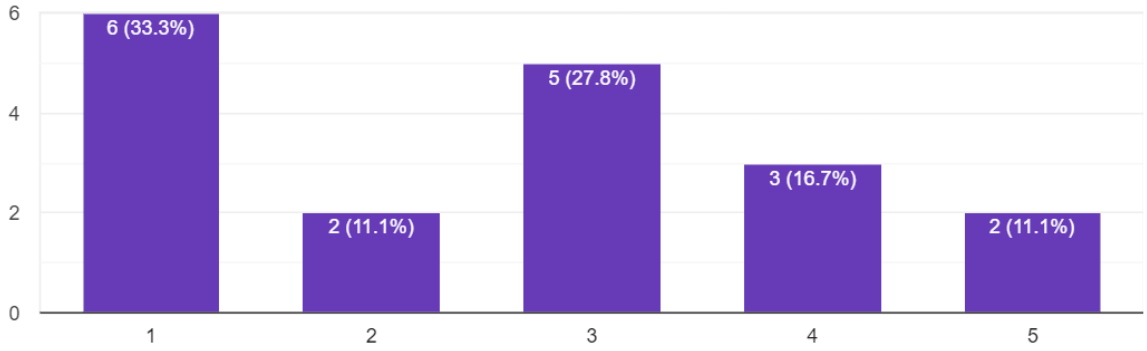

Figure 9. Does using Scratch help you understand English grammar?

Based on the data shown in figure 10, the question is very big, big, neutral, not big, not very big How much influence does Scratch have on improving overall English language skills? 33% of teachers answered very helpful, 33% helped, 27% replied neutral, 0% replied no help, and 5% replied not very helpful.

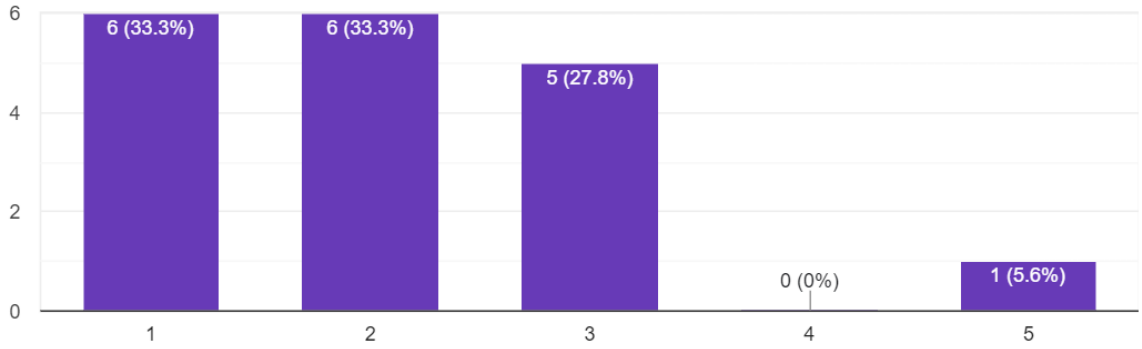

Figure 10. How much influence does Scratch have on improving overall English language skills?

Domain	**% Positive Response**	**Mean Score**
Understanding Scratch	87%	19.6
Vocabulary Acquisition	55%	19.6
Instructional Comprehension	77%	19.6
Reading Skill Improvement	65%	19.4
Writing Skill Improvement	71%	19.6
Grammar Understanding	44%	19.6
Overall Perceived Language Improvement	66%	19.6

Table 1.1

This section presents the findings of the study on teachers' perceptions of Scratch programming and its impact on students' English language skills. Data were analyzed from responses given by 18 teachers who completed a structured online survey. The results are thematically organized into four main domains: (1) Familiarity and Use of Scratch, (2) Vocabulary Development, (3) English Language Comprehension and Production, and (4) Overall Impact Perception.

Acquaintance and Regularity of Scratch Utilization

A significant majority of educators (87%) demonstrated a comprehensive comprehension of Scratch and its operational use in the classroom. Concerning use frequency, 38% said they use Scratch "very often," while 11% stated "often," indicating that over half of the respondents consistently integrate Scratch into their teaching practices. The data indicate that instructors are not only acquainted with Scratch but also use it as an educational instrument. To enhance clarity and understanding, Figure 1, entitled "Teachers' Familiarity and Frequency of Scratch Usage," should use standardized color coding, named axes, and percentage values for visual uniformity.

Learning new words and understanding what they mean

The comments were mostly good when it came to building language. 44% of teachers said that their students learned new English words "very often" while using Scratch, and another 11% said that it happened "frequently." Also, 55% of teachers said that Scratch helped their students understand what English words meant, which supports its role as an engaging tool for learning a language. The present numbers, on the other hand, don't include standard deviation or confidence intervals, which makes it hard to judge how different the answers are. For example, chi-square tests for category poll data should be used in future study to see if the number of reported results is significantly different across groups (for example, based on years of teaching experience or school setting).

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The ability to understand and use English language

It was also said that Scratch helped people understand English directions and improve their language skills. Out of the teachers who "strongly agreed," 50% said that students understood English orders and instructions better after using Scratch, and 27% said they agreed. This shows that Scratch might help students learn by giving them real-life language feedback as part of the code projects. Reading and writing skills got a lot better as well. 38% of teachers said that their students' reading skills in English had "much improved," and another 27% said that they had gotten better.

The writing skills of 38% of participants said they had gotten "much better," and 33% said they had gotten "better." The results of this study support the idea that Scratch programming can help improve both reading and writing skills at the same time. Even though teacher opinions weren't part of the original study, they could provide important background. In the future, polls should include open-ended questions to get first-hand information about certain ways to teach or how students react to Scratch.

Overall Effect Thought to Have on English Proficiency

When asked how Scratch affects students' English skills in general, 33% of teachers said it has a "very significant" effect, while another 33% said it has a "significant" effect. The total average score for all the questions on the poll was 19.575, which shows that people gave good answers in all areas of speaking skills.

Conclusion

This research shows that Scratch programming improves pupils' English language abilities in many ways. Teachers noted considerable gains in vocabulary, reading comprehension, writing fluency, and English-language teaching. These findings imply that visual programming in the English curriculum may improve technology literacy and language development. Scratch's influence on English learning was consistently good in quantitative data from 18 instructors from five schools. The Scratch exercises engaged kids in English via interactive narrative, command-based navigation, and logic-driven problem-solving.

These exercises helped students retain and use vocabulary and grammar by contextualizing their language skills. Scratch in language teaching supports student-centered, inquiry-based, and interdisciplinary learning. Students learned English by doing challenges that included language, logic, and creativity. Students were more motivated and engaged, and learning was more comprehensive. The study supports Scratch in primary school but emphasizes the necessity for ongoing teacher training, curricular alignment, and thorough assessment. Visual programming complements conventional language training by contextualizing it via technology.

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