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UTILIZATION OF CONCEPT MAPS TOWARDS READING AND WRITING PROFICIENCY

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Abstract: *This study aims to identify the impact of utilizing concept maps on improving students' reading and writing skills. This study employs a mixed-methods research design, combining a pre-experimental one-group pretest-posttest approach for quantitative data with thematic analysis for qualitative data. It also employs purposive sampling, as the selected respondents share the same characteristics, being classified as struggling readers under the Grade 8 Basic Education Program of Olongapo City National High School. Findings revealed that the participants of the study performed poorly during the pretest of both reading and writing, with a mean of 8.76 in reading and 8.56 in writing. Results are gathered and interpreted through statistical tools. The pretest score results revealed that students struggle to navigate the assessment due to its traditional structure, which consists of words and sentences. However, an intervention is conducted to examine if there will be an increase in the scores of the respondents. The posttest scores revealed a vast increase in both reading and writing assessments as the participants attained (20.61) in posttest reading and (20.97) in posttest writing assessment, which clearly shows that the utilization of conceptual maps significantly helps the students to acquire the expected proficiency level for both reading and writing skills.*

Keywords: *concept mapping, pre-experimental one-group pretest-posttest, struggling readers, assessment, Zambales, Philippines*

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INTRODUCTION

Learning requires educational resources. According to Lukman (2021), teachers must provide contextualized and localized teaching materials to boost student skills and retention. The Department of Education has issued memos to improve student reading and competency. These resources help students improve and demonstrate competencies. Writing and reading are the foundation of most language acquisition competencies, which suggests employing language in communication. Attiyat (2019) stressed that reading and writing are essential for language and communication skills. Due to ineffective teacher strategizing and a lack of educational resources, most students lack these competencies. The Philippines has the lowest reading score among the 79 participating countries in the recent PISA findings. According to Liu and Talukdar (2017), DepEd Order. 32 s. 2015 requires instructors to create contextualized instructional resources for reading and writing interventions. McMaster et al. (2017) recommend targeted reading and writing treatments to improve students' comprehension, grammar, and word structure. Peter and Singaravelu (2021) examined the main barriers to writing and reading learning. They found that anxiousness, poor language skills, vocabulary, and lack of ideas hinder skill acquisition. Intervention materials like graphic organizers are recommended to close learning gaps. Graphic organizers help students arrange and connect information.

Conceptual mapping in graphic organizers can help improve reading and writing, according to recent ASEAN studies. Students benefit from graphic organizers for reading and writing (Yusuf and Dzulkafly, 2017). Long or conventional texts can hamper students' comprehension. Thus, teachers must provide varied learning materials like graphic organizers. Simple, writing-related educational tools are essential. Aswita & Taufik (2018) suggest using visual organizers to create writing education resources. Visual aids like drawings, diagrams, and graphs help most students learn. Therefore, the visual organizer makes digesting text-only information easier. Four main types of classroom graphic organizers are cyclical, conceptual, sequential, and hierarchical. Even though graphic organizers can

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be combined in many ways (Kurniaman, et al., 2019). According to these researchers, graphic organizers help pupils learn from instructional resources and differentiate themselves from the hardest class duties. Graphic organizers help pupils think effectively when they create a detailed visual guide or plan. Students can use visual organizers to identify textual concepts. Visual organizers are also better for kids who need help identifying material information (Shelvam et al., 2021). Graphic organizers also help students understand and solve textual issues by improving their critical thinking and making problem-solving more fun and systematic (Tavsanli et al., 2018). Graphic organizers simplify complex ideas and information. According to Kalaivani and Radhamani (2023), the organizer activates students' past knowledge and makes links between new and old material to give the best anchorage and make new content more relatable and meaningful. Wise (2022) added that visual organizers can help students who struggle with writing, note-taking, reading comprehension, or lecture focus stay organized. Without visual organizers, children will encounter text and other content outside the classroom. Student self-reliance and analytical thinking improve with smart graphic organizer construction and use (Wise and Cooper, 2019). Graphics make learners more engaging than text-based materials (Sai et al., 2017). Min et al. (2023) discovered that most students considered graphic organizer sessions innovative, engaging, enjoyable, and effective for English language development. Some theories and research findings argue that explicit training is still recommended. Learning is chunked by explicit instruction. This minimizes a student's "cognitive load," or mental energy needed to process knowledge. Reduced cognitive burden frees working memory. According to Lee (2022), learning new skills requires a lot of working memory. Direct or explicit modelling of reading and writing can also assist students understand the abilities (Febrina, 2022). Teachers can mislead students while introducing new skills and concepts. Instruction helps students know where to start and what to do.

Some studies recommend concept maps for reading and writing instruction. Online students' exam scores and learning satisfaction have improved with interactive graphic organizers. Interactive graphic organizers also helped students generate new ideas and create graphic organizers (Estacio, 2021). Graphic organizers help pupils enhance their notetaking, reading comprehension, summarizing, and vocabulary, which deepens their understanding, according to Cala (2019). So, kids can produce new ideas and information independent of the goal, past knowledge, and experience and learn to explain them. Graphic organizers require students to read and summarize significant elements in creative writing (Torrefranca et al., 2021). Vasquez (2019) found that various graphic organizers improve student performance because their perceived use is highly associated to comprehension and understanding. Graphic organizers enhance interactive learning, breaking with standard teaching methods. According to the graphic organizer, this method helps students arrange their thoughts (Magsalay, 2022). Reading and writing are the most important English abilities. These abilities are taught early and anchor the competences of the early childhood education curriculum. With these visual organizers, students will stay involved in their writing assignments and prevent boredom. They enjoy all writing tasks and have no writing phobia. Comprehensive writing skills will develop (Maravilla, 2020). Since most students learn visually, Reyes (2019) found that direct instruction leads to worse retention than illustrative or graphical methods. Problem-solving diagrams and theme, general idea, and supporting idea identification in these graphic organizers encourage critical thinking and comprehension. As reading basic competencies are the hardest to master, semantic web diagrams can be utilized to expand vocabulary (Palma, 2023). Finally, the DepEd develops intervention materials, bridges learning gaps, and encourages teachers to create instructional and intervention materials tailored to learners' needs to address the growing need to improve reading and writing skills.

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Third paragraph. Describe the literature gap the project will fill. Explain how the study is unique and why the problem was chosen.

FRAMEWORK

This study follows the "Schema Theory" (Anderson, 1977) that states that learners' memories are made up of schema networks and that learning involves activating and connecting prior knowledge to new learning concepts or existing knowledge using graphical organizers (Ausubel, 1960) to help teachers facilitate writing and reading. Lariviere et al. (2024) found that graphic organizers like the Frayer Model help math students learn language. Graphic organizers can help students retain information by helping them construct concepts based on the most important learning competencies in the curriculum without having to memorize settings. Language learners need reading and writing macro abilities. However, teachers must intentionally create instructional resources to teach these skills. Numerous factors impact students' reading and writing skills, such as insufficient competence, motivation, and exposure and practice (Sespeñe, 2021). Scholastic issues hamper language learners' macro-skill acquisition, especially in reading and writing. Multiple ASEAN studies have examined the effectiveness and impact of the “Schema Theory” using graphic organizers to aid learning. Lingaiah (2019) found that schema theory students outperformed non-graphical representation students. Wong and Tengah (2021) further believe that graphical representations and organizers may cover all the skills in the specified competencies, making them a universal tool to fill skill gaps. Batrisyiah et al. (2019) found that graphic organizers increase learning more than standard materials or assessment systems. The latest Syah (2018) study found a difference in scores between graphic organizer users. Interviews showed that students have favorable feedback and writing attitudes. Nair et al. (2020) suggest using the data to help teachers create intervention resources to help students read and write, despite the challenges of teaching and reading. Teachers must evaluate students and track their progress. Most teachers teach writing and reading directly, including all the required ideas. Research reveals that learners should employ these concepts to improve their knowledge, and graphic organizers are recommended for writing ideas (Gonzalez et al., 2018). Reading and writing are the least mastered macro skills, so Li et al. (2021) advise that teachers should strengthen their instruction and instructional resources to promote the least mastered competency. Interventions address learners' incompetence and let teachers and students track progress and evaluate schema. Graphic organizers can help students understand abilities and arrange concepts, according to (Bazilai et al., 2018).

OBJECTIVES OF THE STUDY

This study aimed to investigate the impact of using concept maps as intervention materials on the reading and writing proficiency of Grade 8 learners at Olongapo City National High School. The researcher sought to investigate the reading and writing assessments of learners through a teacher-made evaluation validated by language experts and evaluated using a readability test. The researcher identified gaps in reading and writing skills by examining the significant differences between pretest and posttest results of reading and writing assessments for the learners, using the t-test. Moreover the researcher delve deeper into the investigation of how do concept maps enhanced the comprehension and retention in the learning process, and how do individual references, such as cognitive style, prior knowledge, influence the effectiveness of the utilization of concept maps through a qualitative method in which thematic analysis if data is employed by categorizing, analyzing and interpreting the responses of the participants during the conduct of interview.

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METHODOLOGY

Research Design

This study employed a mixed-method research design to attest to the reliability and validity of the results. Specifically, it utilized a sequential explanatory mixed-methods approach, first measuring quantitative results and then supporting them with qualitative findings to explain the effectiveness of concept map utilization. Sequential explanatory design involves the quantitative gathering of data before the qualitative data to achieve quantitative results. Schoonenboom and Johnson (2017) noted that mixed-method research combines the advantages of both qualitative and quantitative research. They can provide learners with a more comprehensive picture than either one alone. This study employs a sequential explanatory research design to investigate the results of both quantitative and qualitative data. Quantitative data were collected using a pretest-posttest approach. In contrast, thematic data analysis was used to elucidate the underlying reading and writing behaviors and to support the qualitative data associated with the intervention material. The researcher aimed to compare the results of the pretest and posttest to assess whether the intervention material, in the form of graphic organizers, had an impact on the respondents' proficiency levels in reading and writing. According to Stratton (2019), pre-test and post-test designs are also employed to gauge respondents' views or impressions on an occurrence, as well as to gauge comfort levels using knowledge gained during training sessions or the introduction of novel concepts. It stands to reason that an improved understanding or perception of an intervention implemented after the pre-test would be implied by a gain in knowledge or a favorable attitude, as demonstrated by higher post-test scores than pre-test scores. However, thematic data analysis is used for identifying the patterns and themes in the responses of the respondents; qualitative research generally employs thematic analysis. It places a strong emphasis on finding, evaluating, and deciphering patterns in qualitative data, as underscored by Dawadi (2020).

Research Site

The researcher intended to conduct this research at Olongapo City National High School, specifically in the Grade 8 Basic Education Program. The basis for conducting this research among these respondents is the recent results of the Regional Mid-Year Assessment test and their Diagnostic examination.

Participants

The participants of the study are Grade 8 students in the Basic Education Program. Both assessments revealed that most Grade 8 students in the Basic Education Program failed to demonstrate competency in reading and writing. The results showed that sections 11, 12, and 15 had the highest percentage of failing students, with a total of 62 students who were unable to achieve the minimum proficiency level for the competencies included on the assessment. Additional empirical data were gathered from the Project READER, which was administered to students at the beginning of classes. The results showed that some students were still classified as frustrated readers and non-readers. Project READER is under the division memorandum n0.168 s—2018, which is known as (Administration of Project Reader in Secondary English). The researcher is considering creating a new intervention material to aid learners and increase their proficiency level. The data, including the names and details of the respondents, will not be disclosed to maintain the privacy and confidentiality of the responses as mandated by the research ethics. This protection is particularly important in research

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involving vulnerable populations, where breaches of confidentiality could lead to harm or stigmatization (Frank et al., 2015).

Instrumentation

Three research tools are used. Start with a teacher-made 50-item reading and writing pretest-posttest. Significant mean score changes and the material's impact on responders are examined. The second tool is an open-ended interview to assess students' reading and writing habits and graphic organizers' competency impacts. Intervention uses teacher-made grade 7 reading and writing graphic organizers as the third tool. Each item in these resources is authenticated by content and skill language specialists. These materials also consider the mandated structure in developing instructional and intervention materials, DepED order no.5 s.2016, which requires teachers to improve the planning, designing, and creating of systematically, locally, and contextually designed learning materials to improve students. Following DepEd memorandum no.144 s. 2020, The Preparation of the Learning Materials in All Learning Areas across Grade Levels, highly accessible, high-quality, and relevant learning resources are regarded for instrument face validity. For material validity and reliability, the researcher thoroughly built the equipment. Items' psychological structure and substance are evaluated. Pretest and posttest, including intervention materials, are readability evaluated with drawings and structures for reliability and validity. Regulation and readability consensus employ the graphic-based Fry Graph Formula. Instrumentation construction involves everything. Since all respondents struggle with reading and writing, homogenous purposive sampling is adopted. Researchers must know their research goal to select and contact qualified persons using this sampling method. Purposive sampling collects reading and writing data from similar respondents. An intervention will be created and used to improve participants' reading and writing skills and test concept maps' effectiveness. The tool measures quantitative data with a t-test and qualitative data with thematic analysis. This study respects the 2012 Data Privacy Act to safeguard participant data and outcomes. Participants whose parents/guardians disagreed were not forced to participate. Participant involvement and privacy must always be recognized, says Bueno (2020). Thank participants, especially low-income ones, and encourage engagement. Use mobile data credits survey respondents earned to pay for data consumption or ask cell operators to eliminate these prices. Before the activity, consent, approval, and validation letters are sought. Respondent scores are confidential.

Data Collection

Descriptive statistics using the t-test are employed to identify the effectiveness of the intervention material using the graphic organizers, and also to determine the significant difference between the scores of the respondents. However, thematic analysis is performed to assess the influence of graphic organizers on the reading and writing behaviors of the learners. Mean is used to identify the average scores of the respondents in both the pretest and the posttest. Mean is also used to calculate the overall score of the pretest and posttest for the respondents. A Dependent T-test is employed to identify the significant difference in the pretest and posttest of the respondents using the intervention materials. Standard Deviation is used to describe how measurements within a group are distributed from the average. (expected value or mean. Thematic Analysis is performed to assess the qualitative data from the structured interview to better analyze the influence of concept mapping on the students' reading and writing behaviors.

RESULTS AND DISCUSSION

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The significant difference in performance between respondents, as revealed in their pretest and posttest results for both reading and writing, is discussed in this part.

Significant difference between the pretest and posttest results of the reading assessment

Score	**Pretest Reading**		**Posttest Reading**	
41 – 50 (Excellent)	0	0.00	0	0.00
31 – 40 (Very Good)	0	0.00	0	0.00
21 – 30 (Good)	0	0.00	30	48.39
11 – 20 (Poor)	12	19.35	32	51.61
0 – 10 (Very Poor)	50	80.65	0	0.00
Total	**62**	**100.00**	**62**	**100.00**
Mean or Average	8.76 (Very Poor)		20.61 (Good)	
Standard Deviation	2.40		1.96	
t-test value	**33.711**			
p-value	0.000			
Decision at 5% alpha	Reject Ho			
Interpretation	Significant			

This reveals a sharp increase in the respondents' scores in both reading assessments, following the intervention phase that utilized concept maps. Consequently, reading comprehension significantly correlates with the efficacy of concept mapping utilization, as respondents can attain high proficiency (Hwang et al., 2019). Concept mapping enhances students' proficiency in various reading skills, including noting details, summarizing key concepts, resolving conflicts, and sequencing events. Barta et al. (2022) pointed out that concept mapping enhances students' schema in reading by establishing connections between information in the reading selection, thereby improving learning outcomes and increasing retention through visual representations. Moreover, concept mapping enhances students' ability to organize logical information from the reading selection. Students can gather, manage, and identify relationships between data using concept maps. (Zandvakilih, et.al., 2019). It has been demonstrated that concept mapping helps learners' reading comprehension abilities.

Significant difference between the pretest and posttest results of the writing assessment

Score	**Pretest Writing**		**Posttest Writing**	
41 – 50 (Excellent)	0	0.00	0	0.00
31 – 40 (Very Good)	0	0.00	0	0.00
21 – 30 (Good)	0	0.00	30	48.39
11 – 20 (Poor)	7	11.29	32	51.61
0 – 10 (Very Poor)	55	88.71	0	0.00
Total	**62**	**100.00**	**62**	**100.00**
Mean or Average	8.56 (Very Poor)		20.97 (Good)	
Standard Deviation	1.96		1.48	

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t-test value	**41.805**
p-value	0.000
Decision at 5% alpha	Reject Ho
Interpretation	Significant

Concept mapping during intervention may improve students' writing skills. Teaching with concept maps helps students organize, prepare, and improve their work. Critically reviewing and updating concept maps helps students enhance their arguments, identify conceptual gaps, and improve writing coherence (Dowd et al., 2015). Concept maps let students see the big picture, making them effective. Learning begins with higher-level concepts and is broken down by relevant connections. Understanding the big picture helps people remember and value details (Bressington et al., 2018). Concept maps help writers arrange their thoughts clearly and coherently, identify key features, and explain how concepts relate, according to Ligita et al. (2020). Concept maps help organize content, generate ideas, and improve writing clarity and structure. Concept maps help writers organize ideas visually. It helps authors organize, plan, and brainstorm by graphically representing ideas and their connections. Concept maps help authors visualize the relationships between ideas and main themes to write logically. Concept maps are great for brainstorming, organizing, and refining written material. According to Nofah & Nofah (2022), idea maps can assist overseas students write academic English. An interview with responders will assist determine if the conceptual maps helped students and if this technique connects with reading and writing evaluation improvements. The responses differed in portions, but the researcher used purposeful sampling because they are all struggling readers in basic education. Interview audio was recorded and transcribed orthographically. Students' spoken words and noises showed uncertainty, reluctance, difficulties, sentence fillers such "like," "you know," "so," and "I mean," and long pauses. Throughout the interview, their thoughts stayed consistent. Conceptual maps improved both macro-skills, especially writing, for all respondents. They can organize their thoughts and ideas in a conceptual map before writing a paragraph, making it easier to write relevant, related, and meaningful paragraphs. Almulla and Alamri (2021) suggest using concept maps to organize ideas and link sentences before writing a paragraph. This allows students to focus on the concept rather than memorizing facts. It helped develop the ability to adjust, arrange, and regulate comprehension, which helped properly comprehend and perceive ideas and restructure learning scenarios into conceptual forms or designs, conclusions, or new relationships, which helped increase significance, semantics, and relevance in new situations and problem-solving. After participating in idea map activities, study participants discussed their experiences. Concept mapping helped their writing and reading, they said. Concept mapping has been shown to improve reading comprehension. Idea mapping would strengthen students' analytical, structural, and creative skills, making them better readers. Concept mapping, a critical reading and instruction strategy for boosting students' material comprehension, was suggested as a reinforcement plan (Chiang, 2021). Concept mapping is difficult, subjective, and lacks a precise explanation for the concept, but it has more benefits than downsides. Both quantitative and qualitative results reveal that students' reading and writing performance improves. Participants' reactions support the pretest-posttest data. The quantitative data reveal reading and writing performance improvement, indicating no bias. The results are further illuminated by participants' explanations of how concept maps helped them reach the standard skill level in both categories. Pretest and posttest were done to confirm that the results match participants' opinions of concept map use and its usefulness in improving competence. Only clear convergence of outcomes is implied. Answering quantitative questions is equivalent to answering qualitative ones, allowing for additional comparison of results, even when convergence is apparent, as indicated in the results. Only

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if the need for credibility is great enough to justify independent qualitative and quantitative research is this duplication warranted. This study's qualitative and quantitative data showed that concept maps improve meaningful learning and elicit thought-provoking and previous schema. Quantitative data were evaluated using the pretest-posttest, and the researcher interviewed to discover qualitative data themes. Results revealed kids' reading and writing improved. The students' themes showed that not all participants answered the interview question on the material's impact on them, exposing the research's flaws. All participants took the pre- and post-test to assess and analyze quantitative data. The researcher used selected students' interview responses to quantify and evaluate the study's qualitative data to draw conclusions. Both qualitative and quantitative data are interpreted logically in accordance with the study's structure, design, and research goals. The study answered questions and achieved its purpose.

CONCLUSION

The pretest resulted in poor reading and writing scores of 8.76 and 8.56, respectively. The results are analyzed statistically. The pretest scores showed that students struggle with the assessment's word-and-sentence format. However, an intervention is conducted to see if responders' ratings rise. The participants' posttest reading and writing scores increased significantly, with 20.61 and 20.97, respectively, demonstrating that conceptual maps help students reach the expected proficiency level for both reading and writing. In the interview, participants described how conceptual mapping enhanced their reading and writing skills. Reading and writing scores improved significantly between pretest and posttest. Thus, we rejected the null hypothesis (pretest and posttest reading and writing scores are not significantly different). It merely means concept mapping is successful and a useful method for teaching macro skills. Students can better understand topics expressed by forms through concept mapping. Concept mapping helps promote critical thinking skills like problem-solving, summarizing, sequencing, noticing specifics, organizing knowledge, and recognizing general and supporting details. The study seeks to prove idea mapping's writing and reading benefits. Based on her findings, the researcher advises pupils to improve their reading and writing. However, teachers will spend time, resources, and effort creating instructional tools to benefit students. Assessments will always be the foundation for student needs analysis. Assessment helps track students' development by supporting the assessment triangle—observations, interpretations, and comprehension. Teachers can see errors when reviewing student work. Cognitive breakdown analysis helps teachers build student learning. Designing tests for students' levels is also advised. Illustrations and graphical organizers should be used in teaching aids to assist students understand concepts rather than memorize facts. The method can help improve student retention. Finally, administrators should invest in materials that ensure students have fair access to resources. Teachers should use idea mapping to construct writing and reading materials. A parallel study should confirm idea mapping's usefulness and validity for producing new intervention materials.

TRANSLATIONAL RESEARCH

This study helps instructors and students construct effective reading and writing interventions. This study found the greatest strategy to increase students' reading and writing. The Philippines ranked lowest in PISA; conceptual maps can help students learn. Some studies advocate idea maps for reading and writing. Interactive graphic organizers boost online students' exam performance and learning satisfaction. Interactive graphic organizers enabled pupils build novel ideas and graphic organizers

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(Estacio, 2021). Cala (2019) states that graphic organizers improve notetaking, reading comprehension, summarizing, and vocabulary, deepening students' understanding. Thus, youngsters may create and explain new concepts and information regardless of the objective, past knowledge, and experience. Creative writing graphic organizers encourage students to read and summarize key elements (Torrefranca et al., 2021). Graphic organizers boost student performance since their perceived use is substantially connected with knowledge and understanding, according to Vasquez (2019). Graphic organizers defy educational norms by making learning participatory. This strategy helps students organize their thoughts, says the graphic organizer (Magsalay, 2022). The most crucial English skills are reading and writing. Early childhood education curriculum competences are anchored on these skills. Students will avoid boredom and stay engaged in writing with these visual organizers. They adore everything writing and have no writing anxiety. Complete writing talents will improve (Maravilla, 2020). Since most students learn visually, Reyes (2019) discovered that direct instruction reduces retention more than illustrative or pictorial methods. Problem-solving diagrams and theme, general idea, and supporting idea identification in graphic organizers promote critical thinking and comprehension. Reading basics are the toughest to acquire, thus semantic web visualizations help boost vocabulary (Palma, 2023). Finally, the DepEd produces intervention resources, bridges learning gaps, and encourages instructors to construct individualized instructional and intervention materials to improve reading and writing skills. Scholars recommend: (1) analyzing the learning task for words and concepts students must understand; (2) arranging them to show relationships and patterns of organization; (3) evaluating the visual's effectiveness and simplicity; and (4) replacing words with empty slots to encourage active reading. When doing this study, instruct the class on how to use and why certain visual organizers are effective. Introduce kids to different visual organizers. Not all youngsters benefit from Venn diagrams over T-charts. Finally, demonstrate pupils how to use several graphic organizers to let them choose a new tool for future projects.

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