I-WE-YOU: A MATH TRICK BASED TEACHING APPROACH IN CALCULUS

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APPROVAL SHEET

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Abstract

This study aimed to investigate the comparative effectiveness of the I-We-You Trick-Based Learning Approach and traditional teaching methods for Grade 11 STEM students. In a quasi-experimental design involving 115 participants, the research utilized a Google Site platform to implement the instructional models. One group experienced traditional teaching methods, while the other engaged in the I-We-You model, breaking down the teaching process into three stages. The subsequent statistical analysis revealed a significant difference in academic performance between the two groups. Importantly, a moderate effect size was observed, indicating the practical significance of the I-We-You approach in enhancing student achievement. This finding underscores the transformative potential of innovative teaching methods, particularly the I-We-You model, to positively impact student learning outcomes in STEM subjects. The results contribute to the ongoing discourse on pedagogical strategies in STEM education, emphasizing the need for educators to explore and integrate innovative approaches to optimize student learning experiences. In conclusion, the study advocates for the broader adoption of the I-We-You approach in STEM education, highlighting its potential to address challenges and enhance student performance in these crucial disciplines. The implications extend beyond the specific context of this study, offering insights into the broader landscape of effective teaching methodologies in STEM education.

Keywords: *I-We-You Model, Traditional Teaching Method, Modelling in Teaching*

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Vic Vincent N. Villaver

I. Context and Rationale

Modelling is the bit in the middle. It is the teaching stage that comes between the teacher's explanations of a task or procedure and student practice. It is also the stage that is so often left out or not given enough attention by teachers. Modelling has a number of purposes: to lift the veil on hidden thinking; to demonstrate and break down step-by-step procedures; and to provide excellent examples for students to emulate. The main issue is making sure that knowledge is passed on effectively during this key phase. The big question is about the best ways to train teachers to be really good at this important part of teaching, and figuring out the best timing and methods for modelling to make sure it really helps students learn.

This research focused on the crucial role of 'modelling' in teaching. The idea is to make hidden thought processes clear, simplify complicated tasks into easy steps, and give students great examples to follow. Modelling is super important because it helps students understand the subject matter more deeply and completely (Rosenshine, 2012). To fill this gap in teaching, the I-We-You model has become quite popular. This model breaks down the teaching process into three parts - 'I' (where the teacher shows how to do something), 'We' (where the teacher and students do it together), and 'You' (where students do it on their own). This model is simple but adaptable. However, there are some issues and possible misunderstandings among teachers, which shows that it's important to understand this model well and use it effectively.

This study aimed to check how well different training methods work for teachers when they're in the 'modelling' phase, especially when using the I-We-You method. It also wants to see how well the I-We-You model can be used in different teaching situations, and what problems might come up. A big part of the research is looking at Generation Z, the first group of people who've grown up with technology in every part of their lives. These people

were born after 1995, and it's important to understand what they like and how they learn because this can help make teaching methods more effective. The goal of the research is to learn things that can help improve teaching and learning for both teachers and students.

II. Innovation, Intervention, and Strategy

In response to the identified challenges within the modelling phase of teaching, this research introduces an innovative approach focused on refining the I-We-You model. Recognizing the prevalent gap in understanding optimal methods for training teachers in effective modelling, the innovation lies in enhancing teacher proficiency in the I-We-You approach. This initiative is pivotal as it directly contributes to the improvement of the overall instructional process, consequently impacting students' academic performance.

The intervention strategy, designed to fortify the effectiveness of the I-We-You model, involves a structured and comprehensive approach to teacher training. Through targeted workshops and professional development sessions, teachers will delve into the intricacies of each stage of the I-We-You approach. Emphasis will be placed on addressing potential pitfalls and tailoring the model to diverse educational contexts. This dynamic intervention strategy ensures ongoing feedback loops and collaborative discussions, facilitating an adaptive approach that responds to the evolving needs and challenges faced by teachers.

Aligned with the refined teacher training, the overarching strategy aims to bolster students' academic performance through a carefully scaffolded learning experience. The I-We-You model, when implemented adeptly, serves as a scaffold that guides students from teacher-led instruction (I-stage) through collaborative joint construction (We-stage) to independent practice (You-stage). This strategic progression aligns with the identified stages of the I-We-You model, fostering a deep and comprehensive understanding of the subject matter among students. Consequently, Google Site served as a dynamic and innovative

medium for the I-We-You model, encapsulating the essence of each stage. In the "I" part of the model, video lessons emerge as a tangible output of collaborative efforts during the Learning Action Cycle (LAC) sessions conducted by Senior High School Teachers in Mathematics. These video lessons stand as a testament to the collective expertise of educators, providing students with a comprehensive and visually engaging resource. Moving to the "We" part, the Google Site incorporates interactive exercises facilitated through the Google Classroom platform. This stage fosters a collaborative learning environment where both teachers and students actively participate and interact, promoting a deeper understanding of the subject matter. Finally, in the "You" part of the model, online evaluation takes center stage, facilitated by platforms such as Quizizz and e-portfolio through google site. This phase ensures that students can independently apply the acquired knowledge in an assessed context, promoting autonomy and reinforcing the goals of the I-We-You model. The Google Site thus emerges as a versatile and integrated tool that seamlessly aligns with the progressive stages of the I-We-You model, enhancing the overall learning experience.

The research strategy is based on findings from previous studies that highlight the positive influence of effective modelling on students' academic performance. For instance, Hattie and Timperley (2007) emphasize the importance of feedback in the learning process, which aligns with the feedback elements present in the I-We-You model. Furthermore, Joyce, Weil, and Calhoun's meta-analysis (2015) supports the idea that explicit teaching models play a significant role in student achievement. This reinforces the reasons behind this research and the need to provide teachers with targeted training in effective modelling techniques.

Moreover, the intervention strategy draws inspiration from the positive outcomes seen in studies on collaborative learning, which is similar to the "We" stage in the I-We-You model. According to Laal and Laal (2012), when students work together and put in joint intellectual effort, it helps them better understand and apply what they're learning. This

emphasizes the need to improve the "We" stage in the I-We-You model to make it even more effective in helping students learn.

In summary, the innovative approach, coupled with a dynamic intervention strategy and carefully crafted implementation of the I-We-You model, is poised to make substantial contributions to improving both teacher effectiveness and students' academic performance. Through this strategic initiative, the research aims to refine the educational landscape by providing a scaffolded learning experience conducive to deep understanding and independent application of subject matter.

Conceptual Framework

Figure 1: Conceptual Framework

The conceptual framework of this study, as depicted in Figure 1, revolves around the interaction between the I-We-You simple approach classroom as an independent variable and the academic performance of Grade 11 Science Technology Engineering and Mathematics (STEM) students as the dependent variable. The I-We-You simple approach classroom constitutes an efficient instructional venue that accommodates both synchronous and asynchronous classes. It enables teachers to provide specific and in-depth instructions to individual learners, ultimately guiding students to create their e-portfolios modeled after the I-We-You simple approach classroom.

The independent variable, the I-We-You simple approach classroom, is a multifaceted construct encompassing the three distinctive stages. The "I" stage involves teacher-led demonstrations, the "We" stage engages students and teachers collaboratively in joint construction, and the "You" stage empowers students to work independently. These stages

represent a gradual progression from teacher guidance to autonomous student application, forming the foundation of the I-We-You approach.

Conversely, the dependent variable is the academic performance of Grade 11 STEM students. This encompasses their ability to deeply understand the topic, apply it in creating e-portfolios modeled after the Maslow's hierarchy of needs, and fulfill individual learning goals. The academic performance is measured through various assessments and evaluations, aligning with the objectives of the I-We-You model.

The conceptual framework is underpinned by the idea that an effective I-We-You simple approach classroom, when properly implemented and refined, positively influences the academic performance of STEM students. The teacher's proficiency in guiding students through the stages of the I-We-You model, coupled with students' ability to autonomously apply their learning, is anticipated to result in improved academic outcomes.

In summary, the conceptual framework delineates a dynamic interaction between the I-We-You simple approach classroom and the academic performance of Grade 11 STEM students, emphasizing the transformative potential of the I-We-You model in enhancing the learning experience.

III. Action Research Questions

In this action research, the focus was on investigating the effectiveness of the I-WE-YOU Math Trick Based Learning Approach in teaching Calculus to Generation Z learners at Iligan City National High School's Science, Technology, Engineering, and Mathematics (STEM) program during the academic year 2022-2023. The study aimed to address specific questions to gauge the impact of this innovative approach on student academic performance.

The research questions were formulated as follows:

1. What were the demographic profiles of the students in terms of section and gender?

2. How did the students perceive the implementation of the I-We-You Math Trick-Based Learning Approach in learning Calculus?

3. Is there a significant difference between the academic performance of students in the I-We-You Trick-Based Learning Approach group and the traditional teaching group as the intervention was implemented for Grade 11 STEM students?

IV. Action Research Methods

The research design chosen for this study was a quasi-experimental design, primarily selected due to practical and ethical considerations inherent in the educational setting. Notably, the intact nature of groups, with sections already determined by the guidance office, played a pivotal role in justifying this design. In educational environments, logistical constraints and ethical considerations related to student well-being and academic progress were crucial. Random assignment of students to experimental and control groups became challenging when sections were predetermined, making a quasi-experimental design more feasible. This design aligned with the existing educational structure and priorities, allowing for a comparative analysis between naturally occurring groups. The intact groupings enhanced the study's ecological validity, reflecting the real-world conditions of classroom settings. Despite not offering the same level of control as a true experimental design, the quasi-experimental approach remained appropriate for drawing meaningful causal inferences regarding the impact of the I-WE-YOU Math Trick-Based Learning Approach on student academic performance in this specific educational context.

a. Participants and/or other Sources of Data and Information

The participants of the study encompassing a total size of 115 students. The experimental group, Grade 11 – Mt. Pulag, had 57 students, with 18 boys and 39 girls. On the other hand, the control group, Grade 11 – Mt. Banahaw, had 58 students, with 20 boys and 38 girls. All these students were part of the Senior High School, Science Technology, Engineering, and Mathematics (STEM) program, School Year 2022-2023.

b. Data Gathering Methods

The research instrument employed in this study consisted of two distinct questionnaires. The firs research instrument was adapted from Moralista and colleagues' (2022) work on faculty attitudes toward online education. It was designed to gauge students' perceptions of online education, particularly in the context of the I-We-You Simple Learning Approach. The questionnaire consisted of two main categories: "Student Learning" and "Class Dynamics," each comprising statements rated on a scale of 1 to 5, representing "Strongly Disagree" to "Strongly Agree." Under the "Student Learning" category, statements assessed students' opinions on the viability and effectiveness of online education compared to traditional face-to-face environments.

The questionnaire aimed to capture sentiments regarding perceived learning outcomes, potential grade disparities, and the overall suitability of online education. In the "Class Dynamics" category, the questionnaire delved into aspects of student-teacher interaction, depersonalization, academic integrity, and the quality of discussions within online education courses. These items were designed to provide insights into the social and interactive dimensions of online learning, considering factors that might influence students' experiences. Further, the final section, labeled "I-We-You Simple Learning Approach," focused specifically on the effectiveness of the I-We-You model in teaching Precalculus.

Participants were asked to express their opinions on the helpfulness of the approach and whether they perceived it as more beneficial than traditional classroom methods.

The second questionnaire utilized in the study was a 20-item teacher-made test focusing on the topics of Basic Calculus in the first quarter, aligning with the Most Essential Learning Competencies (MELCs). This test aimed to evaluate students' understanding of fundamental calculus concepts and served as a measure of academic performance within the context of the I-We-You Simple Learning Approach. The combination of these two questionnaires provided a comprehensive assessment of students' attitudes, experiences, and academic outcomes in the online education setting, specifically concerning the effectiveness of the I-We-You model in teaching Precalculus. The reliability of the adapted questionnaire was tested, yielding a Cronbach's alpha of .831, indicating the internal consistency of the instrument. Similarly, the reliability of the second instrument was assessed through split-half analysis, yielding a reliability coefficient of 0.78.

The statistical treatment for this action research encompasses a tailored approach to address each specific research question. Firstly, in examining the demographic profile in terms of section and gender, descriptive statistics such as frequency counts and percentages will be applied to succinctly summarize the student composition.

Moving on to the investigation of students' perceptions regarding the implementation of the I-We-You Math Trick-Based Learning in Calculus, descriptive statistics, weighted mean was utilized. These metrics will offer a concise overview of central tendencies in student responses, providing valuable insights into the reception of the teaching approach.

Finally, to determine the presence of a significant difference in academic performance between the experimental and control groups, inferential statistics were applied, specifically the Mann-Whitney U test. The justification for choosing the Mann-Whitney U test over the independent sample t-test stems from the non-normality of the academic performance data as

evidenced by the pretest results. Consequently, to ensure the appropriateness and reliability of the statistical analysis, the Mann-Whitney U test, a non-parametric alternative, was employed. This statistical tool aimed to ascertain whether the observed variations in academic outcomes, attributed to the implementation of the I-We-You Trick-Based Learning Approach, held statistical significance. The Mann-Whitney U test's application in this context contributes to a more nuanced understanding of the effectiveness of the teaching approach in the STEM education setting.

The study assumed homogeneity among respondents due to the entrance examination and screening process for the STEM program at Iligan City National High School. Additionally, the reliability and validity of the questionnaire were assumed, considering its adoption from previous related studies.

The research procedure involved the administration of the questionnaire to both the experimental and control groups through Google Form in the first week of February 2023. The timing was strategic, aligning with the Department of Education's preparations for flexible learning arrangements, thereby capturing the participants' perceptions during this transitional period.

In summary, the action research methodology employed a quasi-experimental design, utilized a well-constructed questionnaire as the research instrument, and applied a robust statistical treatment to analyze the collected data. The study carefully considered ethical guidelines, assumptions, and practical considerations in its execution, providing a comprehensive framework for investigating the effectiveness of the I-WE-YOU Math Trick-Based Learning Approach on Grade 11 STEM students' academic performance.

V. Discussion of Results and Reflection

When looking at the results and thoughts from this study, it's important to understand the details that came up during the research. The findings showed details about how effective the I-We-You Trick-Based Learning Approach was in the STEM context, and how it affected students' academic performance. This discussion looked closely at the statistical results, identifying patterns, trends, and significant differences between the experimental and control groups. Also, thoughts on the research method and the use of the I-We-You model in a tech-heavy educational setting added more depth to the discussion.

Question 1. What were the demographic profiles of the students in terms of section and gender?

Table 1. Distribution of the Respondents of the Study Per Section.

	Mt. Pulag	**Mt. Banahaw**	**Total**
Male	18	20	38
Female	39	38	77
Total	57	58	115

Table 1 above showed the distribution of participants in the study across sections and gender categories. In the Mt. Pulag section, there were 18 male and 39 female students, totaling 57 participants, while the Mt. Banahaw section comprised 20 male and 38 female students, summing up to 58 participants. Overall, the study included 115 participants, with 38 male and 77 female students. The balanced distribution between sections and genders ensures a representative sample, contributing to the study's robustness and generalizability. This setup allows for meaningful comparisons between the experimental and control groups, considering potential demographic influences, and mitigates biases related to gender-based variations in learning preferences or responses to the intervention. The results lay a foundation for drawing reliable conclusions about the impact of the I-We-You Trick-Based Learning Approach on academic performance in the STEM context

Question 2. How did the students perceive the implementation of the I-We-You Math Trick-Based Learning Approach in learning Calculus?

Table 2. Students' Perception of Online Information Across Different Dimensions.

Research Questions	*Mean*	*Standard Deviation*	*Remarks*
Authority			
1. Is it clear who is responsible for the contents of the page?	4.51	0.85	SA
2. Is there a way of verifying the legitimacy of the organization, group, company or individual?	4.30	0.85	SA
3. Is there any indication of the author's qualifications for writing on a particular topic?	4.39	0.85	SA
4. Is the information from sources known to be reliable?	4.61	0.52	SA
Accuracy			
5. Are the sources for factual information clearly listed so they can be verified in another source?	4.40	0.62	SA
6. Is the information free of grammatical, spelling, and other typographical errors?	4.18	0.82	A
Objectivity			
7. Does the content appear to contain any evidence of bias?	2.49	1.14	D
8. Is there a link to a page describing the goals or purpose of the sponsoring organization or company?	3.82	0.82	A
9. If there is any advertising on the page, is it clearly differentiated from the informational content?	3.60	1.02	A
Coverage			
10. Are these topics successfully addressed, with clearly presented arguments and adequate support to substantiate them?	4.42	0.67	SA
11. Does the work update other sources, substantiate other materials you have read, or add new information?	4.32	0.73	SA
12. Is the target audience identified and appropriate for your needs?	4.49	0.73	SA
Appearance			
13. Does the site look well organized?	4.51	0.53	SA
14. Do the links work?	4.39	0.64	SA
		0.60	SA
15. Does the site appear well maintained?	4.47		
		0.42	
OVERALL	**4.47**	**SA**	

Legend:

1.00-1.80	Strongly Agree
1.81-2.60	Disagree
2.61-3.40	Neither Agree, Nor Disagree
3.41-4.20	Agree
4.21-5.00	Strongly Agree

The participants' evaluations of online information sources are summarized in Table 2, which assesses various dimensions such as authority, accuracy, objectivity, coverage, and

appearance. In terms of authority, respondents strongly agreed that responsibility for webpage content (M = 4.51, SD = 0.85), verification of legitimacy (M = 4.30, SD = 0.85), author qualifications (M = 4.39, SD = 0.85), and reliability of sources (M = 4.61, SD = 0.52) were clear and satisfactory. Accuracy, however, exhibited a slightly lower mean (M = 4.18, SD = 0.82), indicating a nuanced perspective on grammatical errors in the information. Objectivity revealed a diverse range of opinions (M = 2.49, SD = 1.14), particularly on the presence of bias in the content. Coverage and relevance received strong endorsement, with participants agreeing that topics were successfully addressed (M = 4.42, SD = 0.67), substantiated materials (M = 4.32, SD = 0.73), and were appropriate for their needs (M = 4.49, SD = 0.73). The appearance category garnered high scores, suggesting participants perceived the websites as well-organized (M = 4.51, SD = 0.53), with functional links (M = 4.39, SD = 0.64) and appearing well-maintained (M = 4.47, SD = 0.60). The overall mean of 4.47 (SD = 0.42) indicates a predominantly positive assessment across all dimensions.

The positive evaluations regarding information literacy dimensions were consistent with the goals of the I-We-You model in promoting independent learning. In the "I" stage, participants learned how to effectively assess online information, gaining a solid understanding of criteria such as authority, accuracy, and objectivity. The subsequent "We" stage involved collaborative exploration, where participants encountered various online content and engaged in discussions to reinforce their understanding. This collaborative phase resembled the collective effort of addressing different topics and sources, similar to the joint construction in the "We" stage of the I-We-You model. As participants progressed to the "You" stage, the high mean scores in the overall evaluation indicated their ability to independently apply the criteria learned during the modeling and collaborative phases. This demonstrated the I-We-You model's aim of transitioning learners from guided practice to independent application. The positive implications highlighted the effectiveness of the I-We-

You model in developing information literacy skills, aligning with its overarching goal of empowering students to navigate learning independently and make informed judgments.

Table 3. Students' Perception on the Effectiveness of I-We-You Simple Learning Approach.

Items	Mean Response	Standard Deviation	Remarks
I-We-You Simple Learning Approach really helped me in learning Precalculus.	4.76	0.48	SA
I have learnt more in I-We-You Simple Learning Approach than the traditional classroom.	4.54	0.79	SA
Overall	4.65	0.64	SA

It can be inferred from Table 3 above the students' perceptions of the effectiveness of the I-We-You Simple Learning Approach. The average response for the item "I-We-You Simple Learning Approach really helped me in learning Precalculus" was 4.76 (SD = 0.48), indicating a high level of agreement (SA). Similarly, for the statement "I learned more in I-We-You Simple Learning Approach than the traditional classroom," the average response was 4.54 (SD = 0.79), signifying a strong agreement (SA). The overall average for students' perceptions of the I-We-You Simple Learning Approach was 4.65 (SD = 0.64), reflecting a consistent positive assessment (SA).

The results suggest that students found the I-We-You Simple Learning Approach highly beneficial in learning Precalculus, emphasizing its effectiveness compared to traditional classroom methods. The high average scores indicate a favorable view of the approach's impact on their learning outcomes. This positive reception held implications for instructional design and pedagogical strategies, encouraging educators to consider and integrate the I-We-You model into their teaching practices. The students' perceived effectiveness of the approach provided valuable insights into the potential benefits of

innovative teaching methods, offering a foundation for further exploration and refinement in the context of STEM education.

The positive perceptions of students towards the I-We-You Simple Learning Approach aligned with existing literature on innovative teaching methods and student engagement. Numerous studies highlighted the efficacy of learner-centered and collaborative approaches in enhancing student learning outcomes.

Research by Hattie and Timperley (2007) emphasized the importance of feedback and the active involvement of students in the learning process. The I-We-You model, with its sequential stages of teacher demonstration (I), collaborative practice (We), and independent application (You), aligned with these principles. The model allowed for personalized feedback and fostered a supportive learning environment, contributing to increased student understanding and performance (Rosenshine, 2012).

Furthermore, Vygotsky's Zone of Proximal Development (ZPD) theory supported the collaborative nature of the I-We-You approach. According to Vygotsky (1978), learning was most effective when it occurred within the student's ZPD, the gap between what the learner could do independently and what they could achieve with guidance. The collaborative "We" phase of the I-We-You model provided a structured environment for students to work within their ZPD, promoting optimal cognitive development.

In the context of STEM education, the work of Johnson et al. (2014) emphasized the benefits of collaborative learning, highlighting its positive impact on problem-solving skills and conceptual understanding. The I-We-You model's incorporation of collaborative elements resonated with these findings, suggesting its potential to enhance student performance in STEM subjects.

In summary, the literature supported the positive perceptions of students towards the I-We-You Simple Learning Approach, indicating its alignment with established pedagogical theories and its potential to foster effective learning experiences in STEM education.

Question 3. Is there a significant difference between the academic performance of students in the I-We-You Trick-Based Learning Approach group and the traditional teaching group as the intervention was implemented for Grade 11 STEM students?

Table 4. Test of Difference in the Post-test scores of the Comparison Groups.

Groups	**N**	**Mean Rank**	**Mann-Whitney U**	**Z**	**p-value**
Control (Traditional)	58	38.85	542.5	-6.248	0.000**
Experimental (I-We-You)	57	77.48			

** -Highly Significant at 1% level

The Mann-Whitney U test was used to compare the academic performance between two groups: the control group, which participated in traditional teaching methods, and the experimental group, which was exposed to the I-We-You model through the use of Google Site as a medium of instruction. The results in Table 4 above revealed a statistically significant difference in academic performance between the two groups ($U = 542.5$, $Z = -6.248$, $p < 0.001$**), with the control group demonstrating a significantly lower mean rank ($M = 38.85$) compared to the experimental group ($M = 77.48$). This highly significant finding at the 1% level indicated that students in the experimental group, who were exposed to the innovative I-We-You teaching approach facilitated by Google Sites, outperformed their counterparts in the control group engaged in traditional teaching methods. The implications of these results underscored the potential effectiveness of the I-We-You model in enhancing academic performance in comparison to traditional instructional approaches.

Furthermore, the effect size, which was calculated as 0.342, indicated a moderate practical significance of the observed difference. Effect sizes help us understand the magnitude of differences beyond statistical significance and provide insight into the real-

world relevance of the findings. In this case, a moderate effect size suggests that the I-We-You Trick-Based Learning Approach had a meaningful impact on students' academic performance compared to traditional teaching methods.

The implications of this finding are significant. A moderate effect size indicates that the implementation of the I-We-You model through the Google Site medium was not only statistically significant but also educationally meaningful. This suggests that the innovative approach had a substantial influence on students' learning outcomes, highlighting its potential as an effective teaching strategy. Educators and policymakers may consider incorporating the I-We-You model into STEM education, capitalizing on its benefits for enhancing student performance.

The strong findings from the Mann-Whitney U test, which showed a significant difference in academic performance in favor of the experimental group exposed to the I-We-You model through Google Sites, are consistent with previous research highlighting the effectiveness of innovative teaching methods in improving student outcomes.

Previous studies by Johnson et al. (2018) emphasized the importance of creating active and collaborative learning environments, suggesting that student engagement and understanding improve when instructional strategies go beyond traditional methods. The gradual release of responsibility from teacher to student, as seen in the I-We-You model, aligns with the principles of active learning (Fisher & Frey, 2014).

Furthermore, research exploring the integration of technology in education supports the idea that using digital platforms like Google Sites can have a positive impact on student achievement (Hattie, 2012; Tamim et al., 2011). The interactive and collaborative nature of Google Sites aligns with modern pedagogical approaches that prioritize learner-centered activities (Means et al., 2013).

In summary, the findings of this study echo the growing body of literature that emphasizes the advantages of innovative teaching models and the incorporation of technology in enhancing academic performance. The combination of the I-We-You model and the use of Google Sites emerges as a promising approach for educators looking to improve student learning outcomes in the digital era.

VI. Action Plan

The action research plan in Table 4 on the next page was unfolded systematically, commencing with the approval of the research proposal on February 20, 2023. Subsequently, an orientation session for identified respondents took place in a classroom setting on February 27, 2023, setting the groundwork for the research activities. The online data gathering phase, facilitated through a Google form/survey link, spanned the month of March 2023. The implementation of the I-We-You Simple Learning Approach to STEM students, utilizing various technological tools and platforms, transpired from January to April 2023. Concurrently, data gathering on students' academic performance in Precalculus took place in March 2023. The interpretation of data gathered, combining online survey results and students' grades, was conducted in the same month. The finalization of the action research paper occurred in March 2023. Preparations for sharing research inputs with the Senior High School Math – Learning Action Cell (LAC) Group were made in April 2023, involving official communications and the sharing of research outputs. The SACC Training – Part 1 and Part 2 unfolded in April and May 2023, respectively, incorporating innovative materials and intervention matrices. The SACC application to all Math subjects in Senior High was slated for October 2023, utilizing a range of digital tools and platforms. This comprehensive timeline reflects a well-coordinated sequence of activities aimed at exploring, implementing, and disseminating the I-We-You Simple Learning Approach in the context of STEM education.

Table 4. Action Research Plan

Activities	**Materials Needed**	**Time Frame**
Approval of Research Proposal	Action Research Proposal	February 20, 2023
Orientation for the Identified Respondents	Classroom Setting	February 27, 2023
Online Data Gathering	Google form/survey link	March 2023
The Conduct of I-We-You Simple Learning Approach to the Stem Students	Computer, Smart Phone, Google meet and Zoom link, Personalized YouTube Channel, DIY Light Board, Internet Connection and Applications from Play Store.	January 2023 – April 2023
Data Gathering (Academic Performance or Students' Grades)	Students' Final Grade in Precalculus	March 2023
Interpretation of Data Gathered	Results from the Online Survey and Students' Grades	March 2023
Finalization of Paper	Action Research Output (Hard and Soft Copy)	March 2023
Preparations for the Sharing of Inputs through Senior High School Math – LAC Group	Letter of Intent to the Department Head, Assistant Principal, Principal	April 2023
I-We-You Sharing - Part 1	Action Research Copy and Matrix	April 2023
SACC Training – Part 2	Innovation, Intervention Materials and Matrix	May 2023
SACC Application to all Math Subject in Senior High	Computer, Smart Phone, Google meet and Zoom link, Personalized YouTube Channel, DIY Light Board, Internet Connection and Applications from Play Store.	October 2023

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