Promoting Personalized Learning: The Effectiveness of Peer Teaching Pedagogy

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***Abstract*—Student-centered learning approaches that foster active engagement and personalized instruction have gained significant influence in India's evolving education landscape. However, Peer Teaching remains relatively unexplored in this context, despite its potential to promote adaptability and personalization within the classroom. Involve Learning Solutions Foundation advocates the adoption of peer-based pedagogies that can be tailored to students' needs, leading to improved outcomes, increased engagement, and greater ownership of learning. The study investigates the effectiveness of Peer Teaching in promoting individualized learning and enhancing students' foundational numeracy outcomes. The research is based on a cross-age Peer Teaching program, where senior students (referred to as Student Leaders) are assigned to teach small groups of 4-5 Learners from junior grades. A mixed method research approach is adopted to address the following research questions: a) Is Peer Teaching associated with changes in students' learning outcomes? b) How does peer teaching pedagogy personalize and adapt to student learning? The study utilises standardized numeracy assessments and classroom observations as research tools. Quantitative data analysis reveals that students' participating in the year-long Peer Teaching program, learning from their peers, exhibit significantly improved performance in end-line assessments. Moreover, strong correlation is found between the number of Peer Teaching hours and the shift in students' scores. Classroom observations demonstrate that Peer Teaching environments provide personalized instructions, responsiveness to student needs, room for immediate feedback, social interaction and the development of adaptive skills. Notably in government schools facing challenges of large class sizes, teacher shortages, and diverse student populations, Peer Teaching proves particularly advantageous by adapting to students' language and cultural contexts, reducing learning gaps and facilitating the introduction of new concepts easier to teachers in their classrooms. This pioneering study offers valuable insights into the personalized learning techniques of Peer Teaching in India, substantiating its ability to improve learning outcomes and foster holistic student development. Nonetheless, further exploration is required to develop peer-based adaptive and personalized online platforms that truly prioritize student-centered education. Thus, this study aims to provide foundational evidence for the development of such platforms, addressing the need for more effective and student-centric educational technologies.**

***Index Terms*—Peer Learning, Pedagogy, and Foundational Numeracy**

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I. Introduction

Involve Learning Solutions Foundation (henceforth referred to as Involve) is a non-profit organization based in Bengaluru, India. Involve works with government schools and communities, creating Peer Teaching/ learning spaces towards building Foundational Literacy and Numeracy (FLN) in students. It also creates opportunities for students to build skills like communication, collaboration, problem solving through participation in the Peer Teaching program. In India almost 200 million students' study in government schools. Data from the Annual Status of Education Report, 2018 and the Learning Loss During the Pandemic by Azim Premji University, 2021 have found that 48% 5th graders cannot do basic reading and Maths [1] and that during the pandemic 80% students lost at least one language and mathematical ability [2]. These learning gaps are exaggerated by teacher shortages and multi-grade multi-level classrooms leading to students not receiving enough personalized attention to significantly shift their learning levels [3]. Involve designed a Peer Teaching program that addresses these challenges by creating shared ownership of learning between the teacher and students themselves. In the Peer Teaching program, students from senior grades (grades 7-8) are selected as Student Leaders and paired with 4-5 Learners from grades 3-8. These Leaders teach their Learners for 40-minute classes, 3-4 days a week. The students teach using content that is designed specifically for the purpose of Peer Teaching and Learning, which includes activities, games and student-friendly worksheets. Since 2018, over 20,000 students have participated in Involves Peer Teaching program. This study is an attempt to understand what type of influence the Peer Teaching program has on student learning outcomes and student engagement in learning. It hopes to provide evidence and advocate for the use of more peer based pedagogies in government school classrooms in India as a potential method to address some of the aforementioned challenges that the system currently faces.

II. Literature Review

A. The sociocultural theory

Vygotsky's perspective on cognitive development highlights its social nature, emphasizing that children learn from experienced adults within their social and cultural contexts.He

refers to two principles: More Knowledgeable Other (MKO) and Zone of Proximal Development (ZPD). MKO refers to a teacher, peer, or someone who has a deeper understanding of a concept than the Learner. ZPD represents the gap between what a child can accomplish independently, and what they can achieve with the guidance and encouragement of a skilled partner. Therefore, according to Vygotsky, cognitive development arises from social interaction involving guided learning where children and partners co-construct knowledge [4]. Peer Teaching is a pedagogical approach that aligns with Vygostky sociocultural theory. It emphasizes the importance of social interaction, engaging in dialogues to co-construct knowledge, and collaboration which enables learning from one another. Peer Teaching also aligns with the concept of ZPD, as it allows Learners to support and guide their peers creating a supportive learning environment where students can develop their knowledgeable skills.

B. Student centered pedagogies

Various pedagogical techniques are used worldwide to enhance student engagement in classrooms. Flipped learning involves students acquiring subject knowledge outside of class and allowing in-class time for problem-solving and peer interaction [5]. Project-based learning engages students in complex projects, fostering independent work and realistic outcomes. [6]. Cooperative learning promotes peer collaboration, either formally or informally, to achieve shared objectives [7]. Brainstorming encourages active participation and the generation of innovative ideas [8]. Gamification introduces game elements to educational settings, increasing engagement and personalized learning [9]. All these approaches create a collaborative learning environment, enhancing student engagement & promoting active learning experiences. Collaborative learning (CL) is an approach in which individuals work together in groups, respecting each other's abilities & contributions [10]. It is widely used in education, involving grouping & pairing students of different performance levels to achieve shared learning goals [11]. CL offers social benefits by establishing a support system and fostering diversity and understanding. It also provides psychological benefits by boosting self-esteem, reducing anxiety, and cultivating a positive attitude towards the facilitator. Academically, CL promotes critical thinking & active student engagement, improved classroom results, problem-solving modeling, personalized classes, and various teaching & assessment techniques [10].

C. Peer Teaching & its outcomes

Peer Teaching is a form of collaborative learning where students collaborate with their peers to achieve meaningful learning experiences. Various forms of Peer Teaching include same-age peer tutoring, cross-age peer tutoring, class-wide peer tutoring, and reciprocal peer tutoring. Same-age peer tutoring pairs students of similar or different skill levels, while cross-age peer tutoring involves older students teaching younger ones. Class-wide peer tutoring involves grouping students of varying proficiency levels, and reciprocal peer tutoring involves taking turns as tutors and tutees [12]. Peer tutoring has benefits in academic, social, and personal development, expanding knowledge, developing skills, fostering friendships, and building confidence [13]. Peer-assisted learning (PAL) has been shown to have a positive impact on students' academic performance. In a study with a population of 154 first-grade students, PAL was found to improve mathematical development. The group participating in PAL showed an average improvement in achievement of 18.86, compared to 16.37 in the non-PAL group [14]. Michale Parkinson did a similar study in enhancing student performance in mathematics and chemistry among first-year biotechnology students [15]. Another study by [16] investigated the impact of PAL on academic performance in specific subjects in their research. These studies provide evidence of the positive effects of PAL on students' marks and academic performance, highlighting its potential as an effective learning approach. However, the literature is lack studies conducted in non-Western contexts, particularly among school students and within the Indian context.

Significance of the study: Studies around the world have shown Peer Teaching and learning to be effective in improving learning outcomes, bridging learning gaps and building student confidence. The pandemic has further increased the need and urgency to adopt such innovative methods to bridge the widening learning gaps among our young Learners. Recently in India, this pedagogy has found mention in the New Education Policy 2020 [3]. Under the section on Foundational Literacy and Numeracy, the policy advocates for the use of Peer Tutoring as a method to improve both Learner and tutor levels. However, there is a lack of evidence on Peer Teaching pedagogy technique in Indian cultural context. Also, most of the research studies on Peer Teaching have focused on high-school or university students. Hence, considering the mention of the pedagogy in the Indian education policy, and to eliminate the literature gap of this study in the Indian context, this study is highly significant for the time.

III. Research Questions and Methodology

The study was conducted over a timeline of one year, from July 2022 to February 2023. During this period, assessment data, and classroom observations were collected from students and classrooms at different stages of the program..

A. RQ1: Is Peer Teaching associated with changes in students' learning outcomes?

1) Study Design: This research employed a quasi-experimental research design to investigate the research question. Four schools with similar characteristics, i.e. a semi-urban nature, student population, student-teacher ratio, infrastructure, and other school resources, were selected. Two of these schools were the experimental group, where Involves Peer Teaching program on foundational numeracy was being implemented. The other two schools formed the control group,

where no Peer Teaching program was introduced. The researchers conducted a baseline test in both groups to assess the numeracy level of the students before the intervention of the program. Following the program intervention at the end of the year, an endline test was conducted in both groups using the same set of questions to assess the numeracy level.Of note, this paper focused only on numeracy (and not literacy) for two key reasons, a) the Peer Teaching program had been implemented for improve student learning outcomes for numeracy and a robust program design for literacy had not yet been defined and b) numeracy outcomes have more standardized tools for monitoring and evaluation therefore making the study design easier to implement.

2) Population & Sample: The target population for this study includes the students in the schools of the Anekal block. The sample frame consists of students from grade 3rd to grade 8th in the selected four schools. The sample size for the study was determined as 60 through random selection of children from multiple grades.

3) Data Collection Instruments: A standardized numeracy assessment paper was used as the data collection instrument due to the quantitative nature of the data to be collected. The paper consisted of 12 questions that assessed the students' basic foundational knowledge in numeracy skills. Inspired by the ASER test format, the assessment questions led students through a progression, starting with numerical problems transitioning to pictorial problems and advancing to intricate word problems. Baseline assessments were collected in the month of July-August and the endline assessments were collected in the month of February.

4) Data analysis technique: The assessment was conducted on pen and paper. The answer sheets were corrected by Involve staff, who then recorded the scores onto Google Sheets. The data was filtered to remove any duplications of students. For maintaining the quality of data, the study only considered student data where both baseline and endline scores of the student were collected. Data was analyzed using GraphPad Prism version 9.5.1 for Windows, GraphPad Software, San Diego, California USA, www.graphpad.com. Details of the statistical tests are presented in the results section of the paper.

B. RQ2: How does Peer Teaching pedagogy personalize and adapt to student learning?

1) Study Design: A comparative study design was employed to observe and analyze the prominent classroom interaction patterns, factors influencing student participation, and non-participation in Mathematics classrooms led by a teacher compared to a Student Leader in a Peer Teaching circle. The classroom observation focused on the following variables in both classroom settings: Ownership taken by the facilitator, Student engagement with the learning content, Collaboration with facilitator and peers, Learning progression, Learners asking questions, Student participation in the class, Instructions & feedback provided, Classroom energy.

2) Sample Selection:: A stratified sampling technique was used to select the sample for observation, ensuring representation from all grade levels between 4th and 7th standard. Four random peer groups with diverse populations were selected from each school. From these peer groups, a larger population of students belonging to the same class was chosen for observation. The sample size for observation was 33, and the same students were observed during their teacher-led Mathematics classroom and Peer Teaching Mathematics classes during the months of December and January

3) Observation Protocol: A structured observation protocol designed for the study was used to conduct the classroom observations. The protocol captured the variables of interest and facilitated a focused comparison between the regular and Peer Teaching classrooms. Each observation session encompassed a full class period of 40-50 minutes in accordance with the school timetables. Each observer observed a group of two to three students at a time. To increase reliability and reduce possibilities of bias, the same students were observed by a second observer within a one-week interval.

4) Data Collection Method: Trained observers conducted the classroom observations to assess the variables. Prior to data collection, observers underwent a training program, including trial classroom observations and debrief sessions. During training, observers familiarized themselves with the research study objectives, observation protocol, data collection techniques, and ethics. Observations were recorded by taking written notes.

5) Data Analysis Process: The recorded observations were transcribed and analyzed using qualitative coding techniques. The data were systematically coded to identify recurring themes, patterns, and differences in teaching patterns and student behaviors between the regular classroom and Peer Teaching class. The coded data were then subjected to thematic analysis to generate insights and identify key findings related to student engagement.

IV. Findings and Analysis from Numeracy Assessments

The findings in this section are based on the numeracy assessment of students. The assessment was conducted once at the beginning of the academic year (baseline) and then at the end of the year-long program (endline). Due to the nature of school schedules, not all students who were present during baseline may have been present during endline. In order to ensure high quality of data the study only considered those students for analysis where both baseline and endline data was available. Figure 1 shows the delta (percentage scored on endline - percentage scored on baseline) score of students who participated in the Peer Teaching program compared to students who did not participate in the program. Students in the sample were from grades 3-8. The distribution of students across grades categories in each group is provided in Table I. As illustrated in Figure 1, the study found that students who participated in the year-long Peer Teaching program performed significantly better at Numeracy assessments compared to students who did not participate in the program. While it is

TABLE I
GRADE WISE DISTRIBUTION OF NUMBER OF STUDENTS WHOSE DATA WAS COLLECTED FOR OUR ANALYSIS FROM BOTH PEER-TEACHING (P.T.) CLASS AND NON PEER-TEACHING CLASSES.

Grades	Non P.T. class	P.T. class
Primary (3-5)	31	34
Upper Primary (6-8)	26	21

challenging to attribute causality using this data, the correlation between participation in Peer Teaching and improvement in academic scores is evident through it. The Study then analyzed student endline data from all our schools where the Peer Teaching program was conducted. After filtering we were able to analyze the data of 988 students from 27 schools (including 2 schools where 0 Peer Teaching classes were conducted; control group). Government schools often face the challenge of unforeseen changes in timetables, school closures, unplanned events, visits etc. This leads to changes in school and student schedules. Involves' Peer Teaching program was designed to be conducted 3 days per week (40 minutes per day), but due to the above-mentioned factors, there was significant variability in the number of classes across schools. This variability provided a unique opportunity for the researcher to study the impact of the number of Peer Teaching classes on the student outcomes. For this we collected student data from 27 schools where Involves' Peer Teaching program was being executed. We plotted the endline data of students from each of these schools against the number of Peer Teaching classes for that school (as shown in Figure 2), and conducted a simple regression analysis on the data. While the missing data points and high variability does not provide the most accurate fit (R2 = 0.03730), the positive slope (+0.08730) of the fit point towards a positive correlation between the number of Peer Teaching classes and the endline scores of students. Both these data indicate that the Peer Teaching classes (in addition to the regular classroom teaching) are effective in improving student learning outcomes for numeracy. The reason for this could be related to the personalized nature of the program, where the senior students are able to tailor instructions and support for their Learners based on their previous understanding. Classroom observations discussed in the upcoming sections, provide some explanations on why Peer Teaching appears to be a useful tool to improve student learning outcomes.

V. FINDINGS AND ANALYSIS FROM CLASSROOM OBSERVATIONS

The findings in this section were analyzed based on the themes noted from the Peer Teaching classroom observation focusing on the possibilities of personalization of learning in peer led learning spaces. Classroom observations demonstrated that Peer Teaching environments provide personalized instructions, responsiveness to student needs, room for immediate feedback, social interaction & the development of adaptive skills in students.

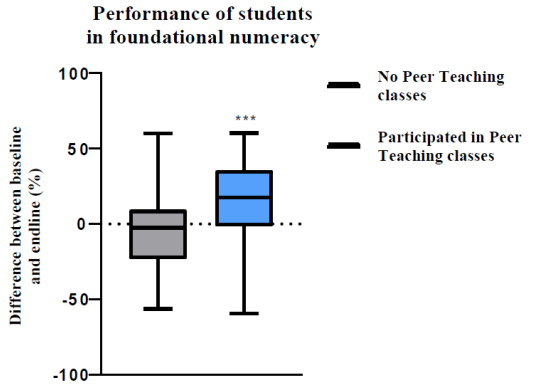

Fig. 1. Comparison of numeracy scores of students who participated in Peer Teaching classes over the year and students who did not. We analyzed the difference between baseline and endline scores of the students on a standardized assessment. The Y-axis represents the delta of the scores. The average change in students who did not participate in Peer Teaching was -4.05% while the difference for students who participated in Peer Teaching program was +15.25%. This difference was found to be statistically different using a One-way ANOVA, p-value < 0.0001 n=57 and 54 for the 2 groups respectively

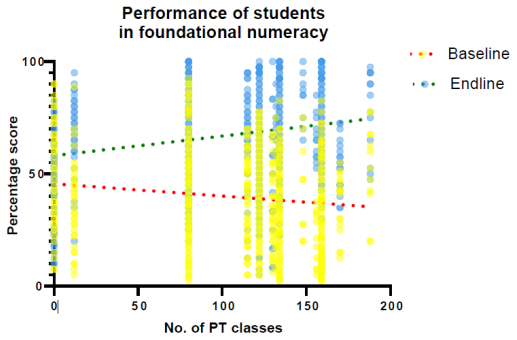

Fig. 2. We analyzed student scores (baseline and endline) in relation to the number of Peer Teaching classes attended by the student. Each point on the graph represents an individual student. We ran a Simple Linear Regression to study the correlation between student scores and the number of classes. The slope (+0.08730) of the fit of the endline data (in blue) indicates a positive correlation between the student scores on the endline and the number of Peer Teaching classes attended by them. n=988 students

A. Responsiveness to student needs creating a supportive learning environment

The Student Leader demonstrated a deep understanding of their peers' abilities, preferences and feelings during the class and utilized this knowledge to provide needed support for them.

> *Anecdote 1:* In the middle of one of the classes, the Learners seem to be distracted, and not interested in learning. Sensing the boredom the students felt with the content and the session, the Leader asked them to close their books and made them do a small movement activity for a while. After this short activity, the Learners were found to be more focused on the content.

Government schools commonly have students coming from other parts of the country who are unfamiliar with the local language (Kannada). After explaining the topic in general to all the Learners, Student Leaders sit with these Learners individually and explain the problem or activity helping them to read, understand Kannada and solve the Maths problem.

B. Providing contextualized examples relatable to students

Student Leaders incorporated additional examples out of their guide book to help the Learners understand the Maths concepts.

> *Anecdote 2:* While teaching the topic of subtraction the Leader explained the concept using stones as chocolates, "You have 5 chocolates in your hands, I took 2 chocolates from it. How many do you have in your hands now?" In another class while teaching division, the Leader explained the concept by bringing the example of land division and drawing them on the floor, "A mother has 4 children , they have 2 (pieces of) land, then how can it be divided among all?"

Using such local examples the content became more meaningful and relevant to the students.

C. Personalized instructions and feedback give customized learning experience

From the observations it was evident that personalized instructions played a major role in promoting individualized learning experiences for the student Learners. Student Leaders were seen adopting various strategies to personalize the instructions including providing extra questions to students facing difficulty in specific topics, reducing the pace of teaching on topics based on students' progression, taking extra time to help students who found learning hard, and pairing the students with their peers for support.

> *Anecdote 3:* Ajay, a learner, was having a hard time understanding a Math activity. The Leader sat with him and explained the activity slowly with patience and did the activity with him while other Learners were paired in groups to do the same.

In most of the classes it was observed that in addition to the practice and revision questions given in the Leader guide book, the Leaders made question papers personalized to their Learner group levels and conducted formative assessment model tests in between the sessions. The Leader also gave new problems to the students who completed the problems in their workbook earlier.

D. Peer Teaching through personalized instruction promote collaboration and social skills

Collaboration is the key to an engaging classroom. In the Peer Teaching classes it was observed that the Learners after completing their work voluntarily help their peers who are facing difficulties in solving the problem, without the Leader assigning them. In one of the classes, two Learners were observed helping their peers in the group multiple times to solve the problem. They voluntarily engage in this, when they see their Leader busy and engaged in helping someone else. In multiple classes the Learners were also observed seeking help from their peers when challenged by any questions. Student Leader and Learner collaboration was also observed in classes. The Leader explained a problem to the Learners and asked two of the Learners to volunteer and explain the next problem to the group. This allowed the Leader to assess understanding and encourage the participation of the Learners, who are eager to collaborate and volunteer. It was observed in the Peer Teaching class students asked questions to Leaders in the form of doubts, significantly more times they asked doubts to their teachers in their Maths class. Similarly, peer to peer collaboration was also observed more in a Peer Teaching classroom compared to a regular classroom.

E. Peer Teaching encourages self-reflection and individual learning progression

In the Peer Teaching class, the students have their individual learning track and level of progression. In the same class while some Learners/ groups were working on basic operations, a few of the Learners who were familiar with the basics moved onto higher rigor work like word problems. In a Peer Teaching class unlike their regular Math class, they do not have to wait until all their peers finish solving the question. Having smaller groups and individual workbooks, they can move from one stage to the other within a concept/ level according to their pace of learning with support from their Student Leaders. Hence the students take ownership and actively engage in shaping their learning path.

VI. Discussion

This research focuses on the impact of Peer Teaching on students' learning outcomes and its positive influence on student engagement with the content and their peers during their learning process. Previous studies conducted in various cultural contexts have consistently shown the effectiveness of the Peer Teaching model in improving student learning outcomes. A study conducted in Israel analyzing the existing model for Peer Teaching in Tzemach school developed a model integrating Peer Teaching in any age group and subject [17]. However, there is a lack of research on Peer Teaching, specifically in school-age students and the Indian context. This pioneering study aims to fill the gap by validating the benefits of peer-based learning in enhancing student learning outcomes in India. The research examines the effect of the Peer Teaching program implemented in Maths classes by Involve. The findings indicate that the Peer Teaching program increased students' academic scores, and created an environment where peer Learners actively assist their struggling peers, proactively seek assistance from peers, tackle complex Maths problems together, and exhibit increased engagement by asking questions and collaborating with peers. The study also highlights personalized learning aspects of Peer Teaching and its positive impact on student learning. In light of these findings, the

discussion focuses on two interesting aspects of Peer Teaching that are mentioned as follows.

A. Peer Teaching shows positive impact on students learning outcome

Approximately 200 million students in India attend government schools. Research conducted by ASER and Azim Premji University reveals concerning statistics indicating that less than 50% of the students possess the ability to perform basic mathematical operations [1]. This shows a significant gap in the foundational skills that requires urgent attention. One of the contributing factors to this learning gap is the shortage of teachers in government schools. With the limited resources and large student population it is challenging for the teachers to provide personalized attention to all the students. In addition to this, learning variabilities in the class further elevates the challenge as the teachers struggle to address the needs of students with varying abilities and knowledge levels at the same time. It becomes increasingly difficult for the teachers to provide personalized instruction in such a diverse classroom environment. Addressing these issues, the current solutions have centered around teacher training and development, and bringing changes in the curriculum incorporating project and activity-based content. This research study offers compelling evidence for the effectiveness of implementing Peer Teaching pedagogies as a regular teacher practice to enhance students' learning outcomes. The study shows that students who participated in a year long Peer Teaching program demonstrated significantly higher performance in numeracy assessment compared to the non-participating students. The study data also indicated a positive correlation between the number of Peer Teaching classes attended and the students' endline scores, suggesting that increased hours of Peer Teaching is correlated with the improved performance of the students. Given these findings, in addition to the other solutions, integrating Peer Teaching pedagogy into the regular classrooms emerges as an effective approach to address the aforementioned challenges and support teachers in improving student learning outcomes. Leveraging the power of peer collaboration and personalized and adaptive learning nature of Peer Teaching pedagogy it offers a great solution for enhancing educational quality and bridging the learning gap in government schools.

B. Peer Teaching pedagogy facilitates personalized and adaptive learning for students

When students take the role of facilitator in Peer Teaching, they bring a unique perspective as Learners, which is absent in an adult-led classroom. This student lens allows them to understand the challenges their peers face and appropriately respond to that feeling. Approaching teaching from a student perspective, the Student Leaders provide relevant examples and analogies of the concepts from the shared experiences that connect to the Learners' interests. Another effective aspect of Peer Teaching is the use of student language. Student Leaders communicate complex concepts using familiar terminologies that make it easier for the Learners to understand. To Vygotsky, language through interacting with others was a powerful mechanism in a child's cognitive development [4]. Receiving explanations from a more capable peer enables the less capable peer to correct the misconceptions, fill in the gap of understanding, strengthen the connection between new and previous information, and develop new problem-solving skills and knowledge [18]. Furthermore, when this language of interaction is embedded within the culture and social context of the students, it encourages the active participation of the Learners in the discussion and learning process. Thus, Peer Teaching fosters an inclusive learning environment where Learners feel more involved. The collaborative learning environment in Peer Teaching encourages students to actively participate, share their knowledge, and support their Learners. It creates a sense of belonging and builds a peer-supportive community within the learning setting. In a peer-supportive community, students can freely express their ideas, knowing their peers are there to support them with guidance and assistance. It allows them to seek clarification and collectively solve the problem. This collaborative learning dynamic fosters a sense of trust and respect among students creating an environment where they feel comfortable taking risks and making mistakes.While personalization is possible in teacher-led classrooms, factors such as high student-teacher ratios, multigrade classrooms and diverse learning needs within a classroom hinders teachers' ability to provide individualized attention and feedback. Hence, supportive peer learning spaces within the schools offer invaluable benefits to students and serve as resources for teachers that benefit both students and teachers.

VII. Limitations

Though the results of the study make a case for the use of Peer Teaching as a pedagogy towards improving student outcomes and engagement in classrooms, it does have certain limitations. The study was conducted in 4 schools of Anekal block of Bengaluru which limits the generalizability of the findings as it may not fully represent the diversity of the educational settings. Furthermore, while the study was conducted using the mixed method approach of quantitative and qualitative research, the sample size is relatively small. The study also faced limitations stemming from school holidays and student irregularity resulting in differences in sampling numbers. These differences were further pronounced as a result of the overall small sample size of the study. The qualitative nature of the study leaves room for potential biases that could influence the interpretation of the data. Based on the above limitations, we believe that conducting this study with a larger sample size, more rigorous controls and robust tools for qualitative data analysis will help us gain better insights into the potential of Peer Teaching and other collaborative learning programs in helping solve for challenges in achieving student outcomes.

VIII. Conclusion

The paper provides insights into the effectiveness of Peer Teaching pedagogy in Indian government schools. It puts forth the fact that students are often motivated and interested in learning from their peers, as it creates a relatable learning environment for them. Using the findings and evidence as a base, educators can design programs and interventions that create more opportunities for students to interact with their peers. As the role of technology in education and the opportunity that it provides increases, it will also be valuable to explore how to design student-centered technology platforms. Incorporating technology in learning spaces where students can interact with their peers, share ideas and collaborate on projects can increase ownership, engagement, and participation. Expanding learning beyond the school premises by creating peer-led (online or offline) spaces shall enable students to share ideas, engage in conversations with like-minded peers, and collaborate on projects and questions of mutual interest. Students can utilize these spaces to raise awareness about issues such as bullying, menstrual health, girls' education, and other relevant topics. These spaces or technology platforms should be designed in a way that puts students in the driver's seat with minimal adult intervention, allowing them to brainstorm and find solutions. Peer-led technology platforms can also enhance collaboration and social learning among students. It can bring together students from different backgrounds, cultures, and geographical locations. This diversity can enrich the students' learning experiences, exposing them to wider perspectives and ideas. By leveraging the potential of technology, educators can create interactive and inclusive learning environments that enhance student educational experiences and prepare them for the digital age. However, it is crucial to prioritize cyber safety for children and consider cost-effectiveness when developing such programs. Overall, the study and its findings open a world of possibilities for those in the education (and edtech) sectors to reimagine learning to become collaborative and student-centered.

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