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Research Article

A Study on The Usage of Animation as A Pedagogical Tool in Teaching Pre-Primary & Primary Schools in Mumbai

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Abstract: This study explores the use of animation as a pedagogical tool in pre-primary and primary schools in Mumbai. It focuses on assessing the effectiveness of animation in enhancing student engagement and comprehension. The study employs a combination of experimental and survey-based research to evaluate the impact of animation on learning performance. The findings indicate that students exposed to animation-based learning performed better in understanding complex concepts compared to traditional teaching methods. Challenges such as limited resources and the need for trained educators were also highlighted, along with a positive reception from both parents and teachers.

Keywords: Animation in Education | Pedagogical Tools | Pre-Primary & Primary Learning Visual Learning Techniques | Interactive Teaching Methods | Early Childhood Education

INTRODUCTION

Education in Mumbai, a city known for its diversity and vibrancy, faces unique challenges in ensuring that every child receives an engaging, inclusive, and effective learning experience. In recent years, educational institutions have begun integrating animation into their pedagogical practices, recognizing the potential of visual storytelling to captivate young minds. This shift in teaching methods aims to move beyond traditional chalk- and-talk techniques, which may struggle to engage students, particularly in a diverse classroom environment.

The fascination that children have for animation is well-documented. From classic cartoons to modern digital platforms like YouTube and Byju's, animation has evolved into a powerful tool that blends entertainment with education. The use of animated content, including films, videos, and interactive apps, has become a common way to teach various subjects-from basic alphabet lessons to more complex topics like ancient civilizations and the solar system.

Animation is more than just a visually appealing medium; it provides a multi-sensory learning experience that can help bridge the gap between abstract concepts and concrete understanding. Children, who may have different learning styles—whether visual, auditory, or kinaesthetic—can all benefit from animation. It serves as a universal language, allowing for the easy absorption of content, irrespective of cultural or linguistic barriers.

Despite the many advantages of using animation in education, several challenges exist. Schools often struggle with a lack of qualified staff, limited resources, and concerns about the increased screen time for young children. However, with proper investment in training and resources, animation can revolutionise the way we teach. This study investigates the use of animation in Mumbai's pre-primary and primary education, focusing on its impact on student engagement, learning outcomes, and the challenges faced in its implementation. The objective is to present a comprehensive understanding of animation's role in transforming traditional teaching methods into more engaging and effective experiences.

LITERATURE REVIEW

Animation

Animation as a pedagogical tool is not just a modern trend but a revolutionary shift in how we perceive education. Its importance in pre-primary and primary education lies in its ability to make learning accessible, engaging, and memorable. Unlike traditional teaching methods that may fail to cater to all types of learners, animation provides a flexible medium that appeals to visual, auditory, and kinaesthetic learners alike.

Furthermore, animation helps break down complex ideas into digestible, understandable content. This ability to simplify difficult concepts is particularly beneficial for young learners who are still developing their cognitive skills. By presenting information in a visually stimulating and interactive format, animation encourages students to remain engaged with the material, fostering a deeper understanding and longer retention of knowledge.

The impact of animation extends beyond academic performance. It promotes creativity, imagination, and emotional development. Children often form emotional connections with the animated characters they see, and these connections can foster empathy, social skills, and a love for learning. Animation also offers the potential to make education more inclusive, ensuring that students with

different linguistic or cognitive abilities are not left behind. Despite its advantages, the effective implementation of animation in education faces significant challenges. Schools often lack the necessary resources and trained educators to integrate animation into their teaching methods effectively. Moreover, concerns about excessive screen time for young children need to be addressed by finding a balance between digital learning and traditional hands-on activities.

The power of animation is way beyond what we humans can think; it can tell intricate tales and concepts visually appealingly. It is a doorway that connects our real-life smoothly with our imaginations. It is very easily connected to kid's entertainment, but it can become a medium for explaining thoughts, creative expression and art. (Ratn & Deeba, 2023)

Every frame of an animation, whether a 3D computer-generated picture like Pixar's masterpieces or a 2D hand-drawn animation like the old Disney flicks, is meticulously crafted to give the impression of movement.

Animation in the Educational Sector

Kids are drawn to interactive activities and visually appealing stimulations by nature. Schools can benefit from this particular nature of children to help them understand simple and complex concepts. Animation can close the knowledge gap between abstract ideas and concrete understanding. The reason animation works so well in teaching is that it has so many different applications:

- **Visual Interaction:** Animation uses the visual medium to draw in and maintain students' interest. These visuals keep the children actively interested in the learning process when there are vibrant characters, lively motions, and exciting plots.
- **Simplification:** Animation breaks down complex ideas into smaller and more manageable chunks to let the children grasp the information gradually. Young minds can better understand abstract concepts and processes when visually represented.
- **Motivation through positive learning:** Children can develop a love of learning through animation's natural joy and engagement. Engaging animations promotes a positive learning atmosphere, inspiring kids to dive deeper into new subjects and improve their memory. (Kocak & Goktas, 2021)

Theoretical Framework

Animation can revolutionise learning, but a solid theoretical foundation considering multiple factors is necessary.

Cognitive Learning Theories:

- **Dual Coding Theory**: According to this idea, humans better retain information when they can see and hear it; both sight and sound channels are equally important. Because of their engaging sounds and striking images, animations can stimulate both brain regions, enhancing comprehension and memory. (Paivio, 2006)
- **Cognitive load theory**: The strength of our recollection is emphasised by this idea. (Sweller, 2011)

By breaking complex information into small, visually chunked chunks, animations can lessen the cognitive load and help young learners process and remember new information.

Social Learning & Constructivism Theories:

- **Social Learning Theory**: Children pick up knowledge by interaction and observation. (Grusec, 1992) Animations can serve as excellent role models for desired behaviours and social interactions due to their captivating characters and storylines, which can foster healthy social development.
- **Constructivism Theory**: According to this concept, learning is an active process in which kids create their worldviews. (Fosnot & Perry, 2005) Animations can stimulate interest and help students draw connections between what they learn and what they already know, which can catalyse this process.

Commercialization & Customization

Education is now commercialised through digital platforms that have caused a three-sixty-degree spin on how education is delivered and consumed. This shift is beneficial during the formative years of pre-primary schooling.

- In recent years, platforms like Edx, Coursera, have started commercialising their digital education with unique and easy animated videos.
- Customization here refers to altering educational content to meet learners' needs and preferences.
- With the help of a database, they get to know the different learning patterns of children and provide the content accordingly, and each child is challenged accordingly.
- These platforms have used animation to create engaging, personalised learning experiences that cater to individual student needs. (Panchajanyeswari & Veeramanju, 2022)

Application of Animation in Pre-Primary & Primary Education

Animation has multiple benefits, but how efficiently it is passed down to students depends on the educator's potential to implement it into teaching methods. The key channels wherein teachers can blend animation are via lectures, online learning platforms activities, animation videos for exam revisions and online assessments and quizzes. The application of Animation also brings more accessible and engaging evaluation methods. ("Animating Education: A Teaching Tool That Brings Learning to Life," 2023)

Comparison with Traditional Teaching Methods

Researchers Omak Kocak Yuksel Goktas crafted a scrupulous research analysis comparing Education Cartoons and Traditional Method learning. They divided the batch into two groups. One group was taught using

educational cartoons, and the other was taught using traditional methods and practical activities for a week, and then they switched to vice versa. After conducting a four-week-long activity, their findings suggested that children have a longer attention span while learning from cartoons, whereas children taught by traditional methods face distraction. Concept learning is easier for kids to understand and retain via animation than conventional teaching. They also found that the traditional method can be more intriguing when taught, along with practical demonstrations of concepts and activities (e.g., teachers can pick students to act as planets in the solar system) to understand the idea of rotation and revolution. This will also increase the involvement and participation of children. (Kocak & Goktas, 2021)

Emotional and Psychological Impacts

Emotional

Animation touches the core affection of kids for storytelling visual imagery. This emotional engagement motivates young minds to crush the boredom of studies, making it a humorous, exciting drama. Inculcating animation in education will create a better learning environment amongst the kids, and the engrossment of students can also enhance their academic achievements.

Psychological

Animation can psychologically impact and influence students. Animation can build confidence and self-esteem within tiny tots by presenting inspiring stories and positive characters. (Aksoy, 2013) Apart from general studies, animation is also used to educate children about subjects, values, education, and mannerisms. (Fitzgerald et al., 2022)

Parental Involvement & Home Learning

Parental involvement and home learning are crucial in the formative years of a child's education. With the advent of new and modernised technologies like animated videos and comics, it has become straightforward for parents to get involved with their wards and build a solid educational base since the beginning of their educational journey. Active parental involvement benefits students by leading to solid communication skills, better academic performance and improved understanding.

- When parents are actively involved with their wards, it helps them gain a more profound understanding of what was taught in school.
- Suppose the reinforcement happens with the help of easy methods like watching a video while studying. Parents can help their wards with better learning outcomes.
- Children tend to get motivated and perform well when involved with their elders; hence, the engagement can be deepened, resulting in better cognitive development.
- The amalgamation of home learning and the consumption of animated videos can yield a better learning environment and educational outcomes for young children.

Storytelling - Role Of Animated Films & other Animated shows

Creativity & Imagination

Animation can spark imaginary creative boundaries with the stimuli it creates with its story, plot, characters, music, and visuals. The fantasy that kids are exposed to in animated cartoons and films like Inside Out, Zotopia, Soul, etc., can inspire them to build up their narrative. (Erlyana, 2020)

Emotional Quotient

Consuming animation content can increase one's emotional quotient and result in better understanding and expression of emotions, as the storytelling in animation films usually implies overexpressing emotions and gestures to convey the character's state of mind and the scene's emotion. (Finders et al., 2023)

Role of Music & Sound

Other than the development of the story and the characters, music and sound design in animation are important for capturing the attention of young viewers, especially in their early ages. The narrative and instructional value of the animation depends heavily on these components, which are not merely additions. (Kumar et al., 2022) In addition to supporting information retention, they improve emotional connections and cognitive development.

- **Emotional Involvement** - Children find animated videos more relatable and remember when they incorporate music and sound effects that elicit specific emotions. Any scene's mood, whether it be one of excitement, suspense, joy, or grief, can be enhanced by the use of music. Children can relate to the story and characters more deeply due to the emotional resonance, which promotes empathy and understanding.
- **Cognitive Development** - Sound effects and music can improve mental growth by improving the recall rate of information. Content can be made memorable and exciting by using melodic and rhythmic components, for example, rhymes in pre-primary and jingles in upper standards. Songs with captivating tunes and repetition can help young toddlers learn numbers, the alphabet, and moral messages.
- **Culture & Individuality** - music can expose kids to various cultures and customs, building an early feeling of inclusiveness and understanding of the world. Children can learn about various customs and values through the cultural distinctiveness of music, which promotes an appreciation and respect for diversity. (Qiu, 2020)

OBJECTIVES OF THE STUDY

To assess the effectiveness of animation as a pedagogical tool in improving student engagement and comprehension.

To compare the learning performance of students taught using traditional methods versus those taught using animation.

To evaluate the perceptions and attitudes of teachers, parents, and students toward the use of animation in education.

To identify challenges and limitations in implementing animation-based pedagogy in schools.
To suggest improvements and best practices for integrating animation effectively into the curriculum.

Hypothesis

Hypothesis [H(a)]: The use of animation as a pedagogical tool significantly enhances student learning performance and engagement in pre-primary and primary schools.

Null Hypothesis (Ho): The use of animation does not significantly impact student learning performance or engagement.

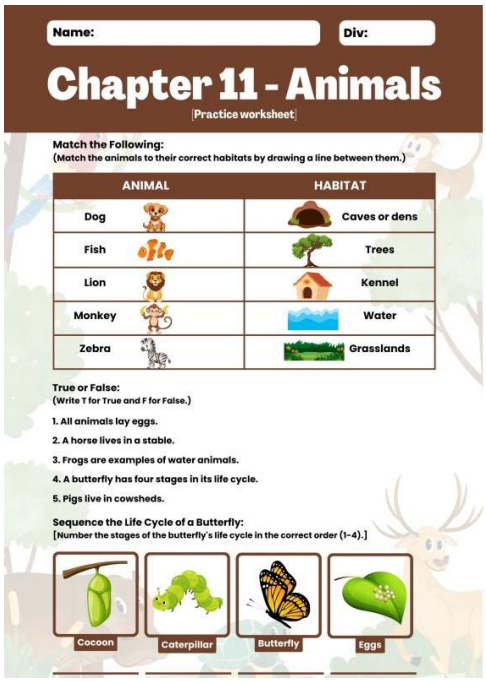
RESEARCH METHODOLOGY

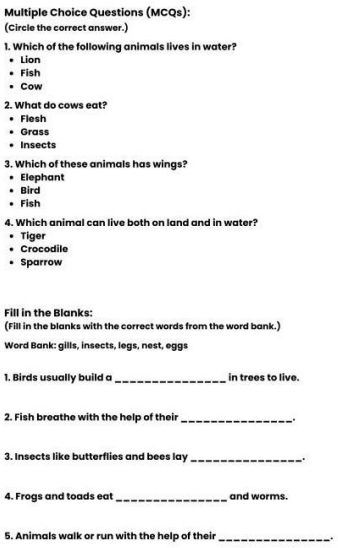
The data collection for this study involved both experimental research and quantitative surveys. A sample of 68 students of a school in Mumbai suburbs participated in the experiment. They were from Grade 2 was divided into two groups: one group of 34 students (Division A) were taught lesson on Animal and their habitat using animation and the other group (Division B) comprising of 34 students were taught using traditional methods. The study also surveyed 34 parents and 12 teachers to gather their insights on animation as a teaching tool.

The experimental results showed that students in Division A, who were exposed to animation, performed better than their peers in Division B. Division A had more students achieving top marks and showed more consistent performance overall. In contrast, students taught through traditional methods exhibited a wider range of results, with some struggling to grasp complex concepts. Non-Probability Convenience Sampling was used for the study.

FINDINGS

The survey responses from parents and teachers further corroborated these findings. Most parents acknowledged the positive impact of animation on their child's engagement and understanding. However, concerns about increased screen time and reliance on technology were also raised. Teachers generally expressed positive attitudes toward the use of animation but highlighted technical difficulties and the time-consuming nature of lesson preparation as barriers.





RESULTS & DISCUSSIONS

1. ***Student Performance***

- **Division A - Animation - Total Students = 34**

Total Marks = (20×21) + (19×11) + (18×2) = 420 + 209 + 36 = 665
Average Marks = 665/34 = 19.56

- **Division B - Traditional - Total Students = 34**

Total Marks = (20×11) + (19×11) + (18×6) + (17×2) + (16×2) + (15×1) + (13×1) = 220 + 209 + 108 + 34 + 32 + 15 + 13 = 631
Average Marks = 631/34 = 18.56

- Students exposed to animation-based teaching consistently scored higher, with an average of 19.56 marks, compared to 18.56 for those taught using traditional methods.
- Animation enhanced comprehension, particularly for abstract concepts like the solar system, where visual representation aided understanding.

2. ***Teacher Perspectives***

- While teachers recognized the benefits of animation, they also cited the need for better training and resources. Many felt that the lack of institutional support and proper software tools limited their ability to implement animation effectively.

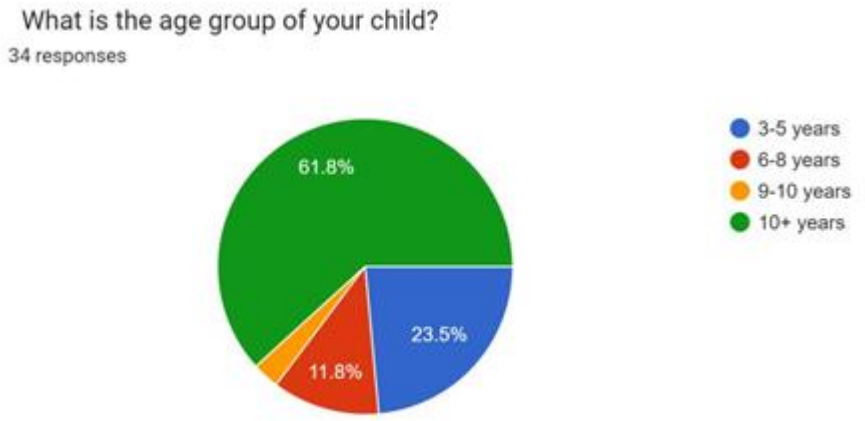
3. ***Parental Feedback***

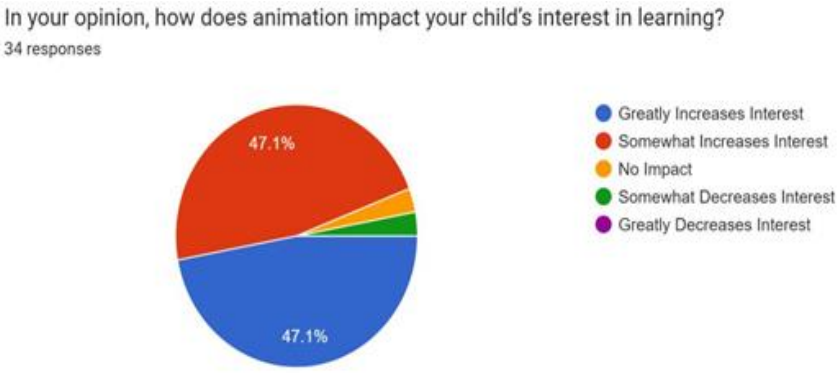
- Parents acknowledged the engaging nature of animated content but expressed concerns about screen time. They appreciated the role of animation in reinforcing classroom learning at home through apps and educational videos.

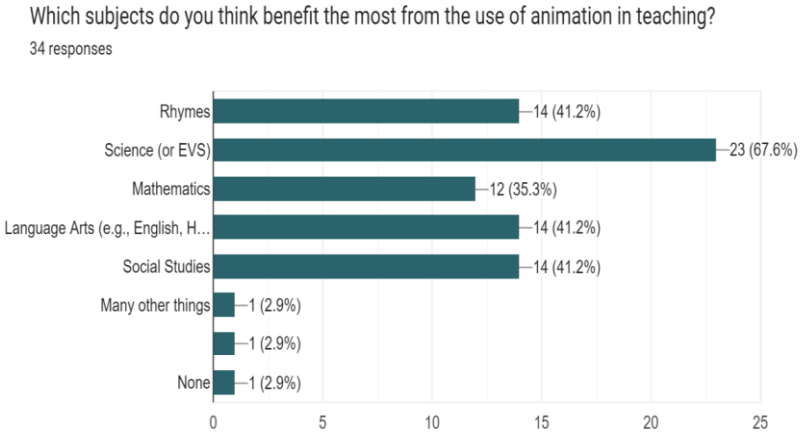
4. ***Challenges***

- Technical limitations, such as the unavailability of advanced digital tools in schools, were significant barriers.
- Screen time emerged as a major concern, with many parents and educators advocating for a balanced approach.

Parents Survey:

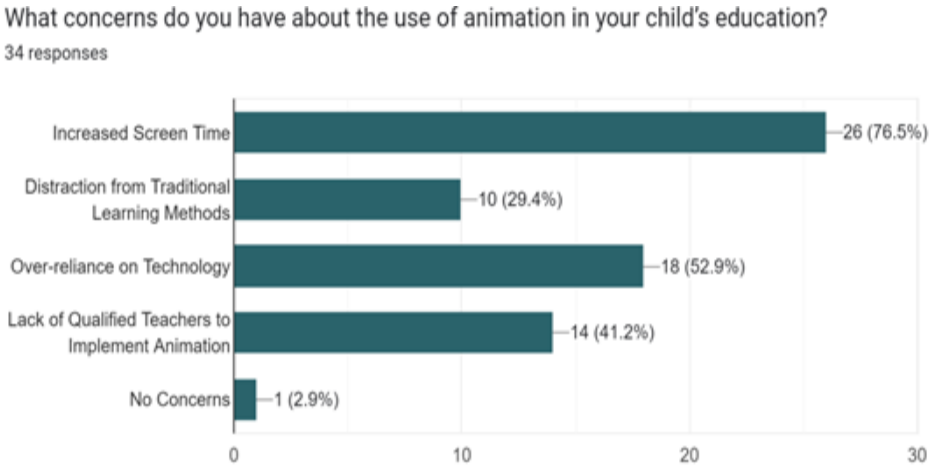






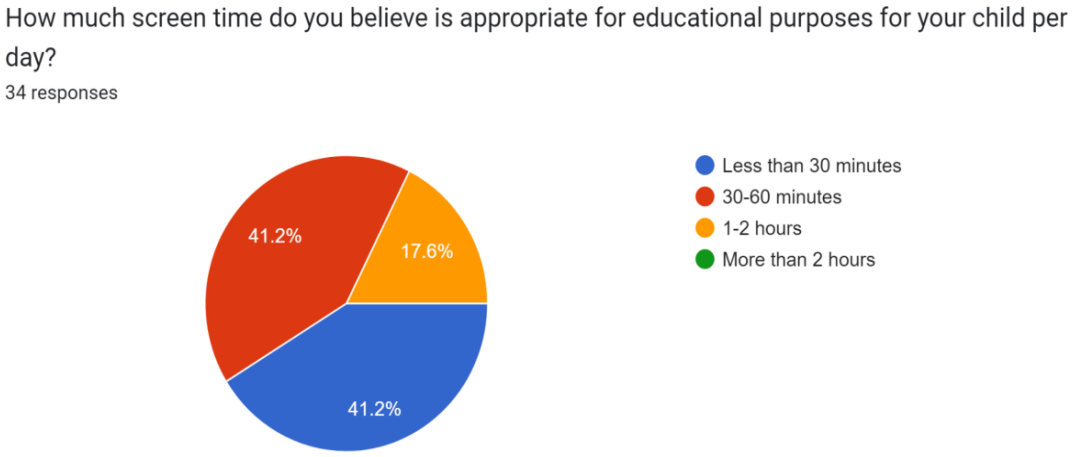
Subjects Benefiting from Animation

Science & EVS, Mathematics, and Language Arts (English, Hindi, etc.) were identified as the subjects that benefit the most from animation.This highlights that subjects with abstract or complex concepts can be better explained through animated content.

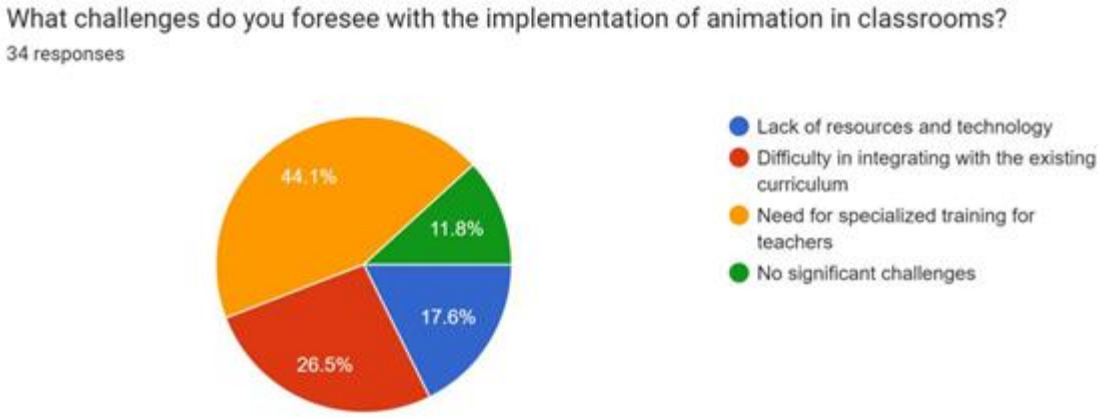


Key Concerns Raised by Parents Include:

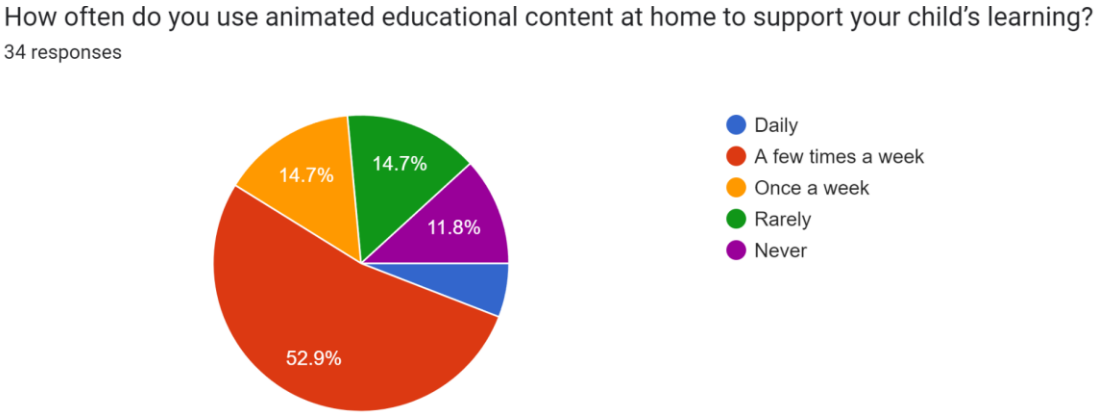
Increased screen time – A primary worry, as excessive exposure to digital devices could have health implications. Diversion from traditional methods – Some parents feel that animation might reduce focus on conventional learning techniques. Lack of qualified teachers to effectively integrate animation into the curriculum. Over-reliance on visuals, which might reduce reading and writing practice.



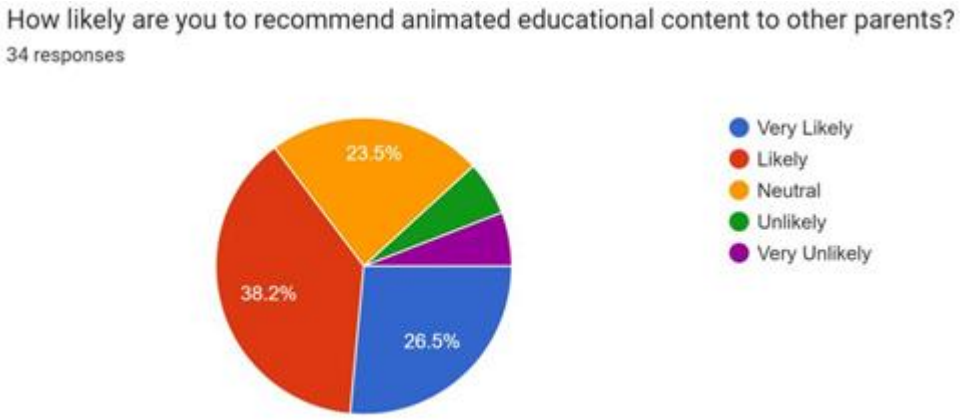
Appropriate Screen Time for Educational Purposes
Most parents prefer 30 minutes to 1 hour of educational screen time per day. A smaller group believes 2 hours or more is suitable, indicating varying comfort levels with digital learning exposure.



Challenges in Implementing Animation in Schools
Lack of resources and technology is cited as the biggest challenge, particularly in government schools. Difficulty integrating with existing curriculum and teacher training are other major hurdles.

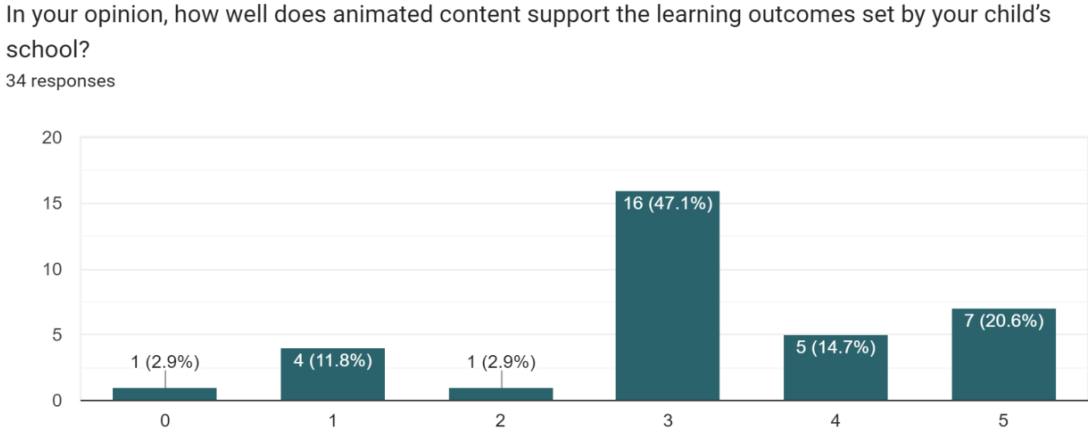


Usage of Animated Educational Content at Home
Majority of parents use animated content rarely or never, suggesting that animation is more school-dependent. A small percentage use it daily or a few times a week, indicating varying levels of digital learning adoption at home.



Likelihood of Recommending Animation to Other Parents

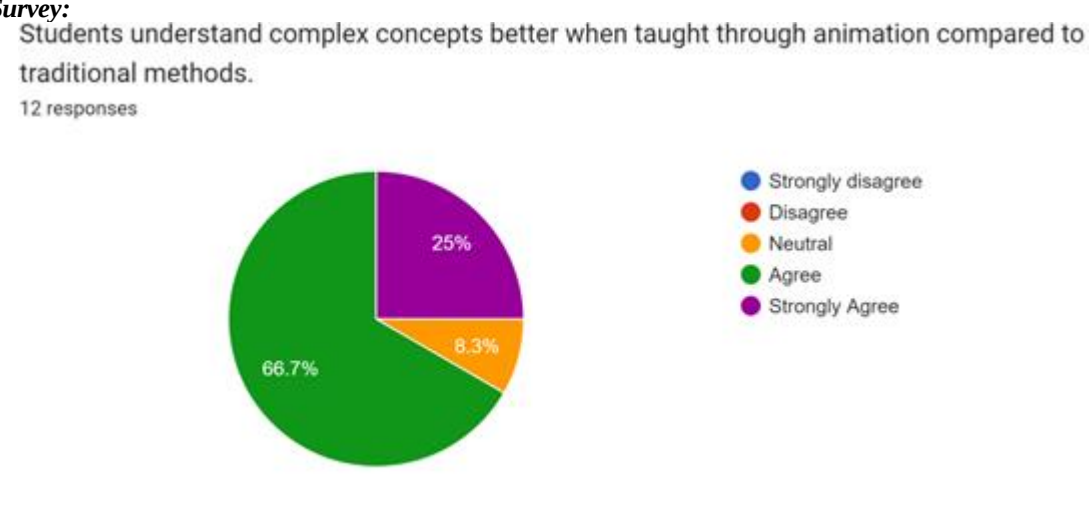
A significant percentage of parents are likely or very likely to recommend animated educational content. However, a small fraction is unlikely to do so, likely due to concerns about screen time or traditional learning values.



Effectiveness of Animation in Supporting Learning Outcomes

Most parents rated animation as moderately to highly effective in achieving school learning goals. A minority felt it had low or no impact, suggesting room for improvement in implementation.

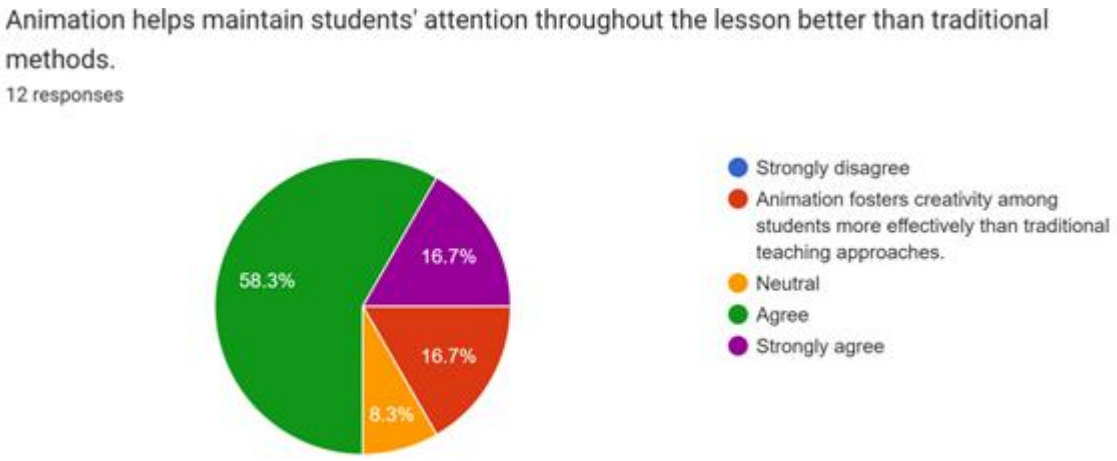
Teachers Survey:



Animation and Student Engagement

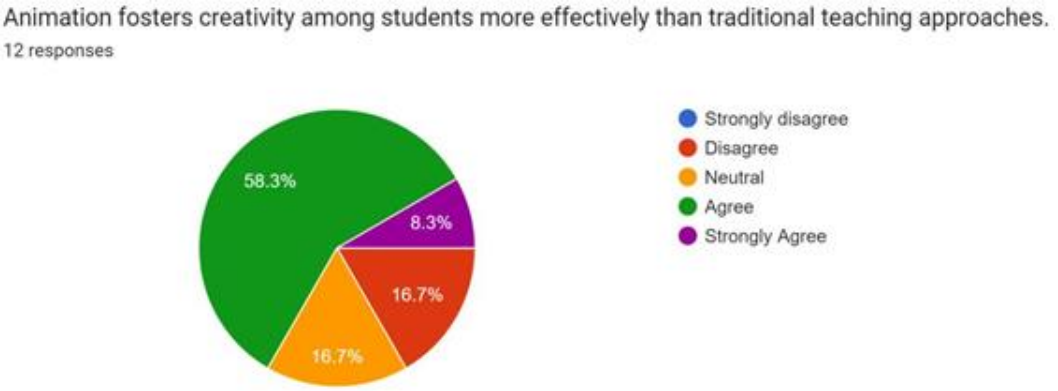
The majority of teachers (66.7%) agree that animation enhances student engagement compared to traditional teaching methods.

A smaller portion (25%) remains neutral, while a minor percentage disagrees. This indicates a strong positive perception of animation as a tool to captivate students' attention.



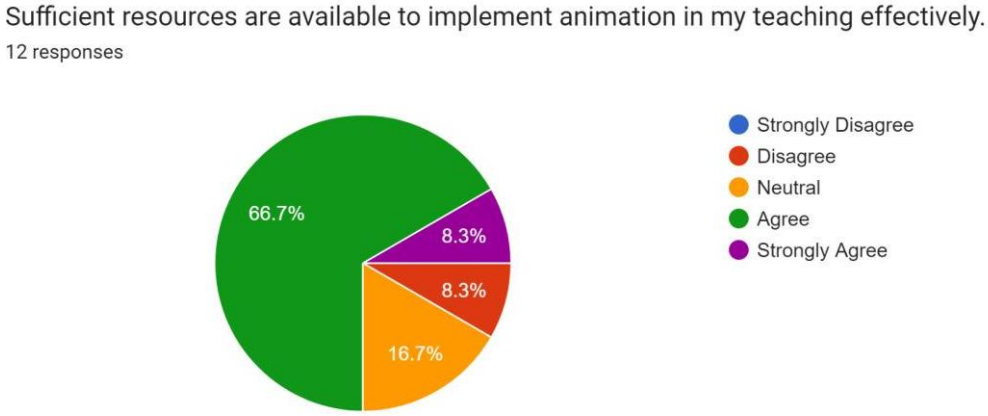
Animation and Student Focus

58.3% of teachers strongly agree that animation helps students stay attentive throughout the lesson. Given the shorter attention spans of young learners, animation serves as an effective way to sustain engagement.



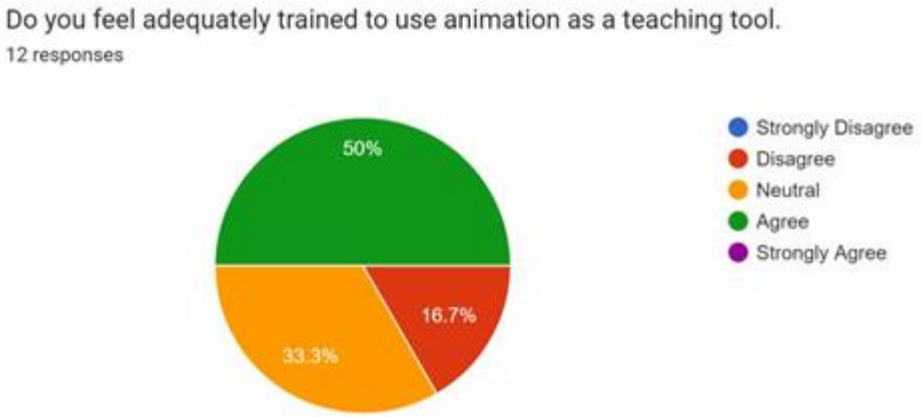
Fostering Creativity

58.3% of teachers agree that animation promotes creativity better than traditional teaching methods. This highlights animation's role in improving imaginative thinking and encouraging student participation.



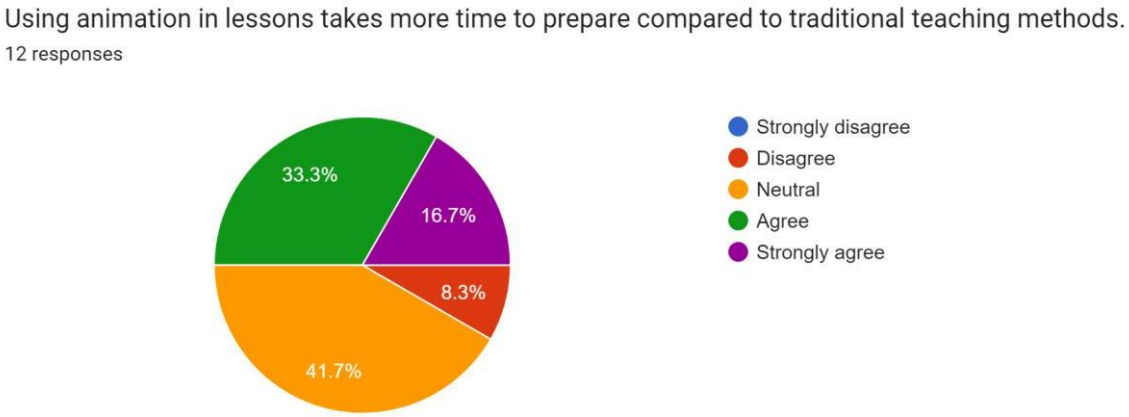
Availability of Resources

66.7% of teachers believe that there are not enough resources to implement animation in classrooms effectively. A lack of proper tools, software, and funding can hinder the full potential of animation-based teaching.



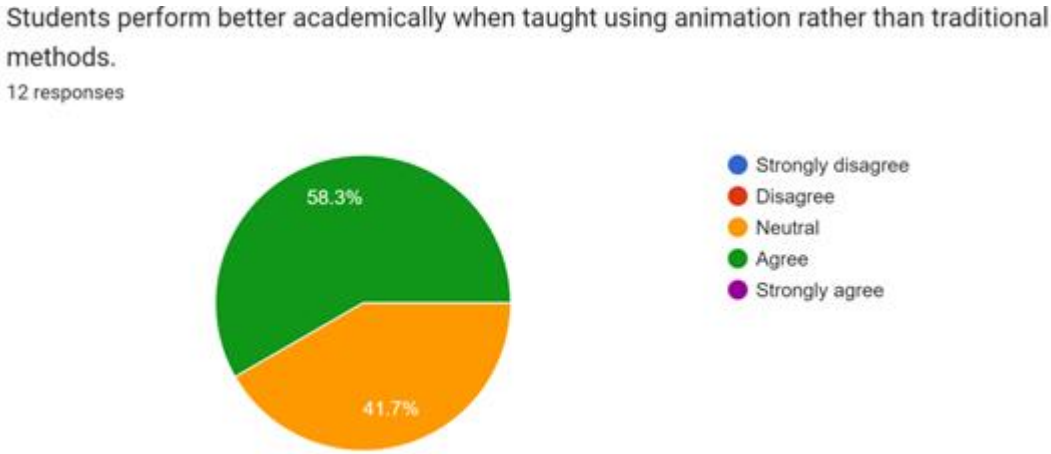
Teacher Training & Readiness

50% of teachers feel inadequately trained to use animation as a teaching tool. This indicates a need for teacher training programs and workshops to enhance their digital literacy.



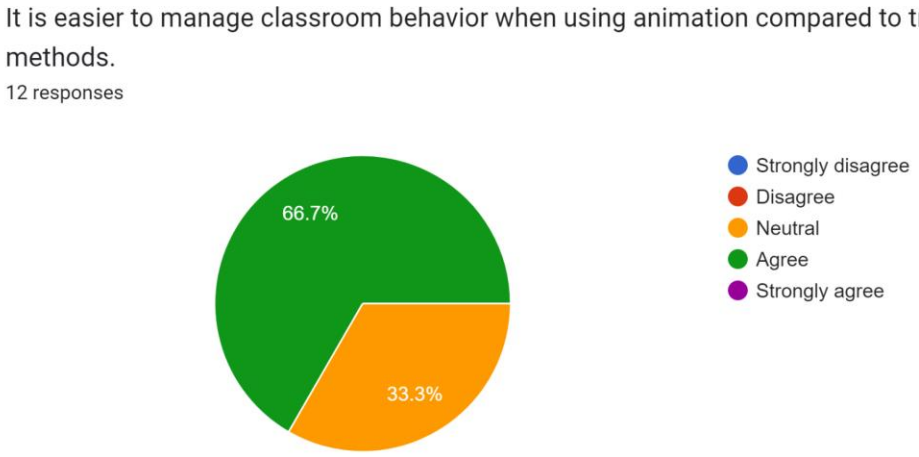
Preparation Time

33.3% of teachers feel that using animation takes more time to prepare than traditional methods. This suggests that despite its benefits, teachers may struggle with the additional effort required for implementation.



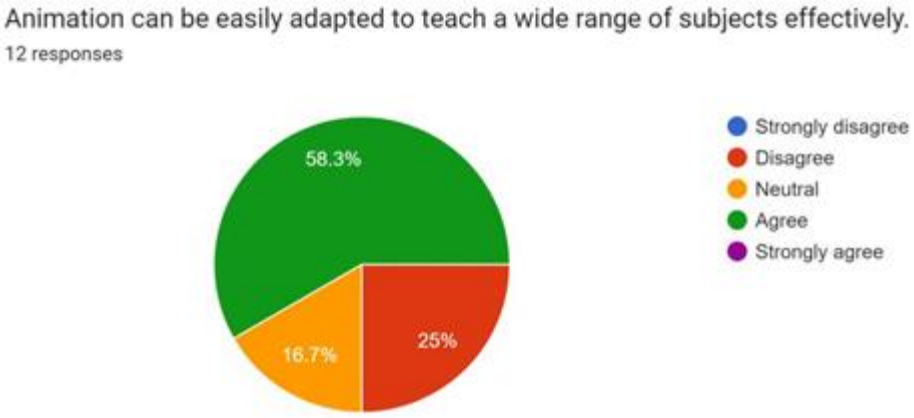
Technical Barriers

58.3% of teachers acknowledge that software issues, equipment failures, and limited accessibility act as barriers to using animation. Addressing these technical difficulties is crucial for smooth integration into classrooms.



Classroom Behaviour Management

66.7% of teachers agree that classroom behaviour is easier to manage with animation. This implies that animated content helps maintain discipline by keeping students engaged.



Versatility in Teaching Subjects

58.3% of teachers agree that animation can be easily adapted to teach a wide range of subjects. This highlights the flexibility of animation in covering diverse curriculum topics.

CONCLUSION

This study demonstrates that animation significantly enhances student comprehension and engagement, especially in pre-primary and primary education. While the challenges of limited resources, teacher training, and concerns about screen time need to be addressed, animation holds great promise for transforming traditional classrooms into dynamic, inclusive, and effective learning environments. By investing in the necessary tools and support, schools can harness the full potential of animation to foster a more engaging and enriching educational experience for young learners.

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