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Teachers's Helper in Teaching: Mechanical Whiteboard Cleaner (MWC)

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ABSTRACT

Learning solely in theory lacks practical application, hindering comprehensive mastery of knowledge. The prevalence of theoretical education neglects practical skills, resulting in unengaging learning environments. To address these issues, the Student's Helper in Teaching: Mechanical Whiteboard Cleaner (MWC) offers a solution. MWC expedites the erasing process, overcoming challenges like insufficient height and fatigue associated with traditional methods. Additionally, it incorporates a projector screen, bridging the technology gap in rural schools. Operating without electrical sources, MWC eliminates cost barriers, aligning with the M.E.C. principle of Mechanical, Easy, and Cheap design. By enhancing classroom efficiency and technological accessibility, MWC not only resolves mundane educational challenges but also inspires students to pursue practical applications of their knowledge, enriching their educational experiences and career prospects.

Keywords: whiteboard; projector; mechanical; teaching and learning; innovation.

1. INTRODUCTION

In the contemporary educational landscape, the integration of technology is imperative for optimizing learning environments and keeping pace with evolving pedagogical practices (Johnson, 2021). However, despite the advancements in educational technology, many institutions still grapple with outdated methodologies and limited resources. This inertia towards technological integration underscores the need for innovative solutions that bridge the gap between theory and practice. Inspired by this necessity, the Mechanical Whiteboard Cleaner (MWC) emerges as a transformative tool designed to enhance the efficiency and effectiveness of teaching and learning processes. By leveraging mechanical components and user-friendly features, MWC addresses prevalent challenges such as time-consuming erasing processes and limited access to technology in educational settings (Lee & Kim, 2019). Moreover, its affordability and ease of installation make it accessible to institutions across diverse socio-economic backgrounds (Choi et al., 2020). Drawing insights from existing literature and market analyses, this paper elucidates the rationale behind the development of MWC and its potential implications for educational practices. By examining the design, functionality, and market potential of MWC, this study aims to underscore its significance in revolutionizing traditional teaching methodologies and promoting student engagement.

The evolution of educational technology has witnessed a paradigm shift towards interactive and immersive learning experiences (Clark & Mayer, 2016). While digital platforms and virtual tools have proliferated in educational settings, the ubiquitous whiteboard remains a staple for conveying information and facilitating discussions. However, the conventional process of erasing whiteboards often proves cumbersome and time-consuming, detracting from valuable instructional time (Kim & Ramachandran, 2019). In response to this challenge, innovations such as the Mechanical Whiteboard Cleaner (MWC) have garnered attention for their potential to streamline erasing processes and enhance classroom efficiency. By integrating mechanical mechanisms and ergonomic design principles, MWC offers a practical solution to the persistent issue of whiteboard maintenance (Garcia, 2018). Moreover, its compatibility with projector screens addresses the need for incorporating digital content into traditional teaching practices, particularly in resource-constrained environments (Lin et al., 2020). In educational settings, the whiteboard serves as an essential tool for both educators and learners, enabling engaging interactions and visual learning opportunities.

Research carried out by Smith (2018) demonstrates that teachers, on average, spend 15 minutes per class session erasing whiteboards, resulting in a significant loss of instructional time over the school year. Furthermore, interviews with educators conducted by Johnson et al. (2020) reveal frustration caused by the manual erasing process, leading to a disruption in the teaching flow and a decrease in student engagement and understanding. From the students' perspectives, attributes such as improved content visibility and the ability to digitally interact with whiteboard materials are considered essential for effective learning (Chen & Jones, 2017). Additionally, a study by Thompson (2019) highlights that students appreciate whiteboards that facilitate collaborative activities and encourage active participation, emphasizing the need for smooth erasing processes to maintain engagement. Nevertheless, the time-consuming process of erasing the whiteboard presents challenges for teachers, taking away valuable instructional time and for students, disrupting the continuity of their learning experiences.

2. METHODOLOGY

The development of MWC draws inspiration from ergonomic design principles and user-centered approaches. By emulating the assembly process of IKEA products, MWC ensures ease of installation and user-friendliness. The adoption of durable materials and mechanical components aligns with the M.E.C framework, emphasizing Mechanical, Easy, and Cheap attributes. Through iterative prototyping and user feedback sessions, MWC undergoes refinement to optimize functionality and usability.



Figure 1. Product Sketch

The Mechanical Whiteboard Cleaner (MWC) targets educational institutions, including K-12 schools, colleges, and universities, as well as corporate training facilities and conference centres. Potential customers within these segments include teachers, educators, trainers, administrative staff, principals, department heads, and procurement officers. The Mechanical Whiteboard Cleaner (MWC) can be positioned as a premium product in the educational technology market, for educational institutions. For corporate customers in the training and conference sector, a slightly higher price can be justified. A tiered pricing strategy based on the target market segments and the perceived value proposition of the MWC can help maximize revenue potential.

3. RESULTS AND DISCUSSION

The market potential of MWC extends across various educational institutions, ranging from primary schools to universities (Liu & Chen, 2020). By addressing common pain points associated with whiteboard maintenance and technology integration, MWC offers a compelling value proposition to educators and administrators (Zhang et al., 2019). Furthermore, strategic partnerships with educational stakeholders and investors can facilitate the widespread adoption and scalability of MWC, thereby maximizing its commercial value and societal impact (Huang et al., 2021).

4. CONCLUSION

The Mechanical Whiteboard Cleaner (MWC) represents a paradigm shift in traditional teaching methodologies, offering a practical and cost-effective solution to enhance classroom efficiency and promote student engagement. By leveraging mechanical innovation and user-centered design principles, MWC embodies the ethos of accessibility and inclusivity in educational technology. Moving forward, continued research and collaboration are essential to unlocking the full potential of MWC and revolutionizing educational practices on a global scale. In conclusion, it is hoped that the Student's Helper in Teaching: Mechanical Whiteboard Cleaner can penetrate the markets of neighboring countries before gradually gaining influence worldwide so that the quality of the educational environment can be improved to a more interesting and less boring space. This is to ensure that students are more interested and motivated to learn, thus making school learning sessions more attention-grabbing and engaging for all students.

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