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Integrating Technology in Schools for Teaching and Learning: Basis for Outcomes-Based Instructions

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Abstract:- In today's dynamic educational landscape, integrating technology emerged as the fundamental strategy to enhance educational experiences and outcomes. The fusion of technology with pedagogy offers vast opportunities to facilitate interactive, engaging, and personalized learning experiences in schools (Voogt, J., et al., 2013). Here is some importance of technology integration in education. First, enhanced engagement and active learning, technology integration promotes active participation and engagement among students by utilizing multimedia resources, simulations, and interactive tools (Puentedura, R., 2006). Second, adapting learning technologies cater to individual student needs, allowing educators to customize learning experiences based on students' abilities, learning styles, and pace (Means, B., et al., 2010). Some Online platforms and tools facilitate collaborative learning environments, enabling students to collaborate, communicate, and engage in group projects irrespective of geographical barriers (Gikas, J., & Grant, M., 2013). Real-world Application and Critical Thinking.

Technology integration fosters critical thinking skills by providing access to real-world data, simulations, and problem-solving scenarios, preparing students for the challenges of the modern workforce (Gee, J.P., 2007). Some of the challenges and considerations when integrating technology into schools may lead to possible problems accessing technology among students and hindering quality learning opportunities (Warschauer, M., 2006). Also, it is necessary to consider that technology when integrated in schools requires faculty development program in order to achieve the necessary good practices in the classroom and maximixe the learning experiences of the students. The shift towards outcomes-based instruction emphasizes learning objectives, competencies, and mastery of skills over traditional content-centric approaches (Gronlund, N.E., 2004). Technology integration aligns well with outcomes-based instruction, as it enables educators to assess student progress and mastery of competencies through adaptive learning online platforms (Baker, R.S., et al 2008), providing immediate feedback and tailoring instruction based on individual learning needs (Black, P., & Wiliam, D., 1998) and facilitating authentic assessments and performance tasks that measure the real-world application of skills (Wiggins, G., 1998). Therefore, integrating technology in teaching and learning offers immense potential which may transform education by fostering engagement, personalization, and the development of 21st-century skills. However, careful considerations and strategies must address challenges such as accessibility and well-planned educator training for optimal utilization of technology to meet such outcomes in education. The digital natives in schools likely learn with technology tools related to their knowledge and skills. With this, the researchers are motivated to delve into such research to gather data from schools that integrate Technology tools in teaching and learning processes. The researchers seek to prove that technology will promote outcomes-based instructions in schools where technology is available and accessible to students. The Department of Education mandated schools to adopt the blended learning modality last 2020 which was during the pandemic time, COVID-19 generally affecting our face-to-face modality which also hit us greatly in the Philippines and other countries. Integrating technology in teaching and learning within schools has become a pivotal area of research, focusing on enhancing educational methodologies and outcomes. Gain some strategic incorporation of technology into the educational framework, particularly in the alignment of producing outcomes in context to the school curriculum maps and learning plans. Education has witnessed a significant transformation due to technological advancements. Traditional teaching methods are being augmented or replaced by innovative technologies. The advent of computers, the internet, educational software, and digital tools has revolutionized the educational landscape.

I. INTRODUCTION

The researchers together with the school administrators have agreed that integrating technology is now the pivotal concern in contemporary pedagogy in schools. With the rapid advancement of technology, traditional approaches to education face significant challenges in meeting the diverse needs of students in an outcomes-based instructional framework. This study seeks to delve into the pressing need to effectively incorporate technology into educational settings, aiming to explore its impact on outcomes-based instruction. The rationale of this investigation lies in how technological integration, when strategically implemented, can revolutionize pedagogical practices, potentially enhancing learning outcomes and preparing students for a technology-driven world. Numerous prior studies have examined aspects of technology integration in education, emphasizing its potential benefits. However, these studies often exhibit deficiencies, particularly in outcomes-based instruction. Existing research frequently lacks a comprehensive understanding of how specific technological interventions align with the outcomes-based approach.

Moreover, many studies have failed to address the nuanced challenges faced by educators in effectively integrating technology into outcomes-based teaching methods. This gap necessitates a more focused exploration that not only identifies these deficiencies but also proposes viable solutions. This study hypothesizes that a targeted and comprehensive integration of technology into outcomes-based instruction will result in enhanced learning experiences and improved educational outcomes for students across diverse learning environments. Its primary aim is to systematically investigate and analyze the efficacy of various technological tools and strategies when employed within an outcomes-based teaching framework.

The problems focused on the study include the following; are there technology integration strategies in schools? What impact did it have on teaching and learning? How was the assessment and evaluation done? Are there challenges and best practices as evidence of the technology integration? Is it Student-Centered Learning? Furthermore, the possibility to gather data focusing on student-centered learning approaches facilitated by technology is essential in the study. The researchers and the school head must conduct a classroom observation. The researchers seek to observe and collect data through surveys, and interviews, then analyze the outcomes of the study if technology matters to the improvement of the learning outcomes in the instructional framework. The conceptual framework of the study aims to consider technology to be integrated into schools. This component focuses on various aspects of technology incorporated into teaching and learning practices. It includes hardware (computers, tablets, interactive whiteboards), software (educational applications, learning management systems), and digital resources (online databases, multimedia content). Outcomes-Based Instruction (OBI). The proficiency of educators in utilizing technology effectively to support Outcome-Based Instructions which includes their digital literacy, knowledge of instructional technologies, and ongoing professional development opportunities. The level of involvement, interaction, and collaboration among students with technology integration involves student-centered activities, peer collaboration, and access to diverse learning resources in schools. Also, it seeks to consider the availability of technological resources within the school environment, including access to devices, internet connectivity, and supportive infrastructure necessary for effective technology integration. Institutional policies, support structures, and leadership initiatives that promote and facilitate technology with outcomes. The possible outcomes are academic achievement, critical thinking skills, problem-solving abilities, digital literacy, and other measurable outcomes when technology is integrated well into the educational framework. The impact of technology integration on teachers' ability to deliver instruction effectively and their satisfaction with teaching methods and student progress. The interconnectedness and relationships between these components highlight how technology integration influences outcomes-based instruction and how various factors, such as pedagogical approaches, teacher competence, and institutional support, mediate this relationship to affect student learning outcomes and teacher effectiveness. Integrating technology within schools for outcomes-based instruction holds promise for revolutionizing education.

II. LITERATURE REVIEW

There is literature as references that focus on the integration of technology within educational settings, specifically concerning outcomes-based instructions. Warschauer (2006) and Gikas & Grant (2013) have examined the influence of technology, particularly laptops and mobile devices, acknowledging both the opportunities and challenges they present in classrooms. Ertmer & Ottenbreit-Leftwich (2013) underscore the obstacles impeding necessary pedagogical shifts for effective technology-enabled learning, while studies by Gronlund (2004) and Wiggins (1998) have explored assessment strategies but lack detailed insights into technology's optimization for outcomes-based assessment. Another source related to the study: the Issues and Challenges from Teachers' Perceptions" (Volume 4, Issue 2) and Voogt et al. (2013) discussed teachers' perspectives and innovative curriculum practices using ICT, emphasizing the crucial role of teacher readiness and pedagogical approaches in technology integration. The Department of Education (DepEd) in the Philippines has underscored the significance of governmental initiatives like the Digital Rise Program in addressing educational quality challenges. However, a significant gap exists regarding how to strategically and effectively integrate technology aligned with outcomes-based instructions, underscoring the necessity for further research to bridge this gap and optimize technology integration for improved learning outcomes.

The objectives of the researchers will be to observe the current scenario in school, the challenges faced for effective strategies, and recommendations when integrating technology in educational settings for outcomes-based instructions. To analyze the existing landscape of technology integration in educational settings and evaluate how technology aligns with outcomes-based instructions. To identify the challenges and gaps in integrating technology with outcomes-based instructions. It also aims to explore the barriers and deficiencies that hinder the effective integration of technology into educational practices aligned with predefined learning outcomes. To explore and delineate effective strategies and best practices for integrating technology in ways that optimize learning outcomes. This objective involves examining successful cases, innovative approaches, and pedagogical methods that effectively utilize technology to achieve specific educational objectives. To assess teacher readiness and training needs for integrating technology into outcomes-based instructions. Also, hopes to discover an understanding of the preparedness of educators, their perceptions, and the required support or training necessary to effectively integrate technology for the learning outcomes to be realized in the classroom. To provide attainable recommendations and guidelines for educators, administrators, and stakeholders. So that at the end of the study, the researchers will be able to synthesize the findings into practical.

III. METHODOLOGY

The researchers are expected to delve into the QUASI-EXPERIMENTAL DESIGN as it seeks to determine the key variables related to technology integration) and outcomes-based instruction. We need to consider other factors that might influence outcomes such as prior knowledge, and teaching methods so that we can decide how to control them. This might include surveys, interviews, observations, and analysis of academic performance data. Surveys and interviews can gather insights from teachers, students, and administrators regarding their experiences, challenges, and perceptions of technology integration. Academic data analysis helps correlate technology usage with student outcomes. Therefore, a survey form will be crafted to gather information and must conduct one-on-one interviews with the target population and participants in the study.

Data Gathering Procedure

Here's a proposed outline of the data-gathering procedure:

Consent forms
Survey forms
Interview forms
Classroom observation
Existing Academic records

IV. FOR THE SAMPLING STRATEGY

The target population includes educators and other stakeholders involved in the integration of technology in schools. To select schools or classrooms that are comparable in terms of characteristics (size, demographics, prior performance). The researcher will randomize participants into control if possible (without technology integration) and experimental (with technology integration) groups. If randomization isn't feasible, we will use matching techniques to create similar groups. The researchers will compare the performance of the control and experimental groups before and after the integration of technology.

The scope and delimitation section of the study outlines the boundaries, limitations, and specific parameters within which the research will be conducted. Here are the scope and delimitation of the integration of technology in schools for outcomes-based instruction. It focused on specific schools, districts, or regions in the Philippines. Targeting educators, administrators, school leaders, and other stakeholders in schools. Examining specific technologies (e.g., laptops, interactive whiteboards, educational software) in teaching various subjects or grade levels. Concentrating on specific learning outcomes aligned with educational standards or curriculum frameworks. The study will cover a certain academic year, specifically for the school year 2023-2024 of a grading period of technology integration on outcomes-based instruction of the participating schools. Google Forms will be utilized in sending the survey form to the participants. Specific time will be included in our consent form to give enough time to the participants to answer and be available during interviews if needed. To be able to come up with the purpose of the study, the researchers will make sure to study a specific focus or sample size. At least 30-50 randomly selected participants from different schools within the Philippines. There might be anticipated factors such as the inability to answer the survey forms, availability of the target sample, and size which might influence the outcomes of the study. Therefore, there are established boundaries for its investigation and acknowledge any limitations, ensuring that the research remains focused, feasible, and transparent about its constraints. To use charts, bar graphs, and pie charts to interpret, and communicate key findings.

V. RESULTS AND ANALYSIS

Based on the responses from the faculty interviews and surveys, the challenges and barriers to Technology Integration involve technical issues and connectivity challenges such as Inadequate internet connectivity, hardware malfunctions, technical problems, and dependency on personal devices leading to inequalities. Second is the time constraints. There were faculty that said it was a time-consuming setup of technology and a lack of time for proper utilization. Student adaptability to technology, some encountered varied student paces in coping with technology and limited access to gadgets and the internet hindering participation. Some of the Faculty's Identified Support Needs for Effective Integration are the Infrastructure and Resources such as strong and reliable internet connections, complete and updated technological equipment, and access to educational software and applications. Professional Development like providing Ongoing training, workshops, and seminars, In-service training focusing on technological skills for teaching. Among the identified approaches to aligning technology with learning outcomes include Purposeful Integration such as the Technology used to serve specific learning objectives and integrating technology to enhance learning. Consideration of resources, and activities like selecting educational tools aligned with objectives and choosing interactive activities or games supporting learning outcomes. Here are examples of successful technology integration based on the responses; accessibility by providing digital versions of resources for easier access. and using videos and multimedia to engage students in literature. Diverse Learning Opportunities include leveraging technology to develop varied skills efficiently and engaging students through educational games and interactive tools. The Identified Training Needs for Faculty focused on Specific Skill Development such as Training on AI usage and creating specific prompts, Understanding the TPACK framework for effective integration. Collaborative Learning Approaches like Workshops emphasizing collaborative tech integration and Strategies for incorporating traditional and modern teaching methods. Many respondents noticed active engagement and great classroom performance in the respective classes. A gamified learning environment allows students to actively involve themselves in classroom activities in a game-like setup. Learning management systems in schools helped students submit their tasks ahead of time with paperless needs. Some say that technology tools improve students' engagement and progress in a daily basis learning plan. There were online platforms helped the teachers make math easier compared to a traditional setup. For the support and resources needed to enhance the

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integration of technology in schools, many mention that they need stable internet connectivity to use such chosen tools, supporting the curricular goals set by the academic council and faculty. Many also need regular training and workshops to keep themselves updated on the advancement. In addition to the findings of the study, respondents recognize the need to be careful in choosing the right platforms that suit the needs of the students per learning area. Planning the lesson ahead of the schedule is also the best practices that enable learning to become accessible and available for the best outcome at the end of the school year. School leaders played an important role in producing the appropriate tool to be used in schools.

To sum it all up, many students admitted that technology gives a great impression that learning is better when technology is integrated into the process. They can better understand complex subjects and resources are readily available when necessary, such as video tutorials, mobile applications, and websites for additional resources for reading and deepening of the subjects. The use of Power Point presentations, the Canva app for editing videos and presentations, and Spin the Wheel are commonly used tools to better present the lessons in the classroom. It holds that technology has the right impact on the progress of the students in terms of speedy access to resources in Math, English, and other learning areas.

VI. CONCLUSION

In conclusion, this study underscores the importance of using technology to improve the quality of education in schools. Research shows that technology can enhance classroom participation and improve learning experiences that help develop the necessary skills.

However, the study also acknowledges challenges like accessibility, the availability of the gadgets being used, stable internet access, and the need for ongoing teacher training to have a holistic teaching and learning experience both students and teachers can avail.

The recommended solutions include a focus on ongoing professional development plans, and educational policies supporting technology that holds promise for improving learning outcomes, and its effective implementation requires a collaborative effort from educators, administrators, and stakeholders according to the context of the school.

Here are some graphs from the responses of the targeted respondents of the study for reference;

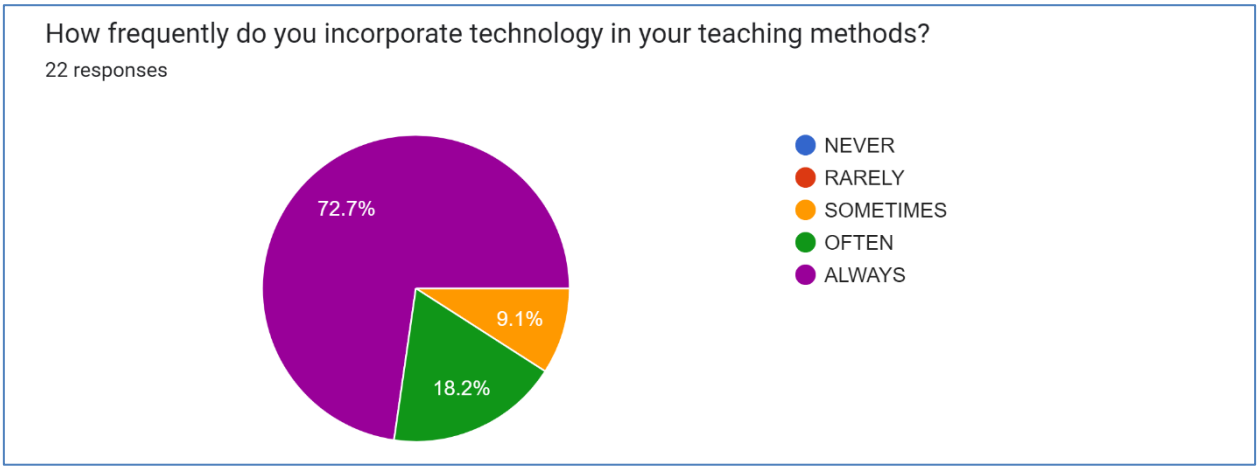

Fig. 1: Shows the frequency of incorporating technology tools in teaching

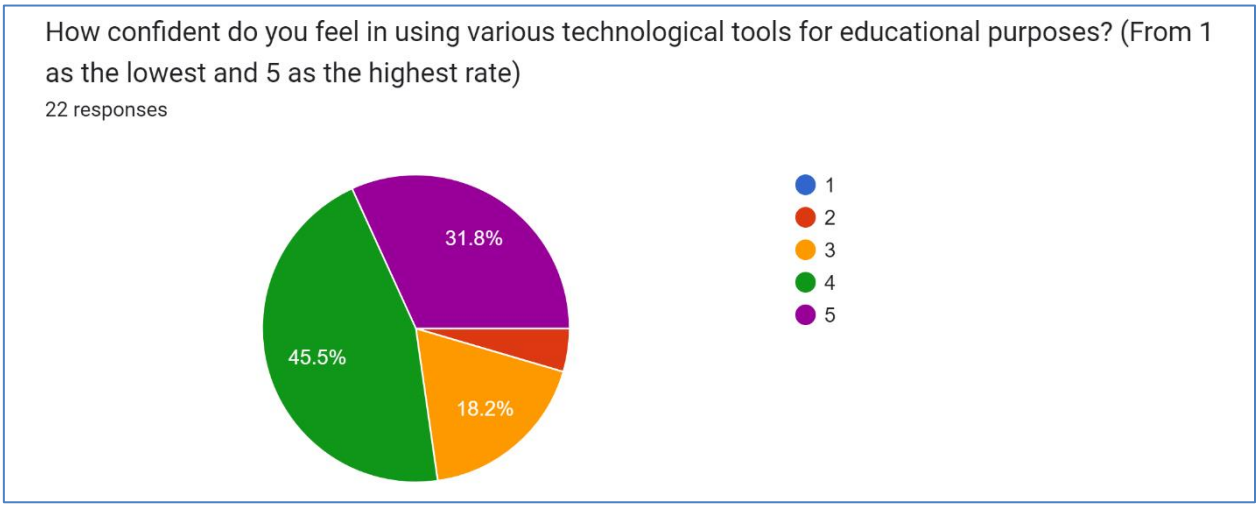

Fig. 2: Shows the confidence of incorporating various technological tools for educational purposes

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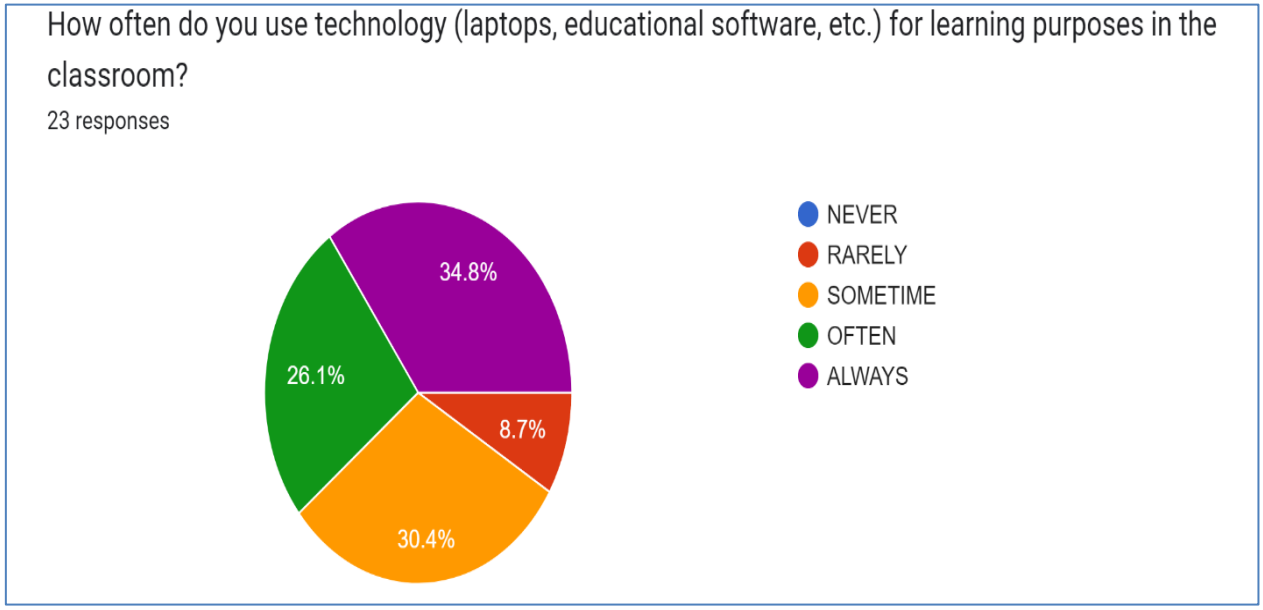

Fig. 3: Shows the frequency of using technology tools for learning purposes in the classroom.

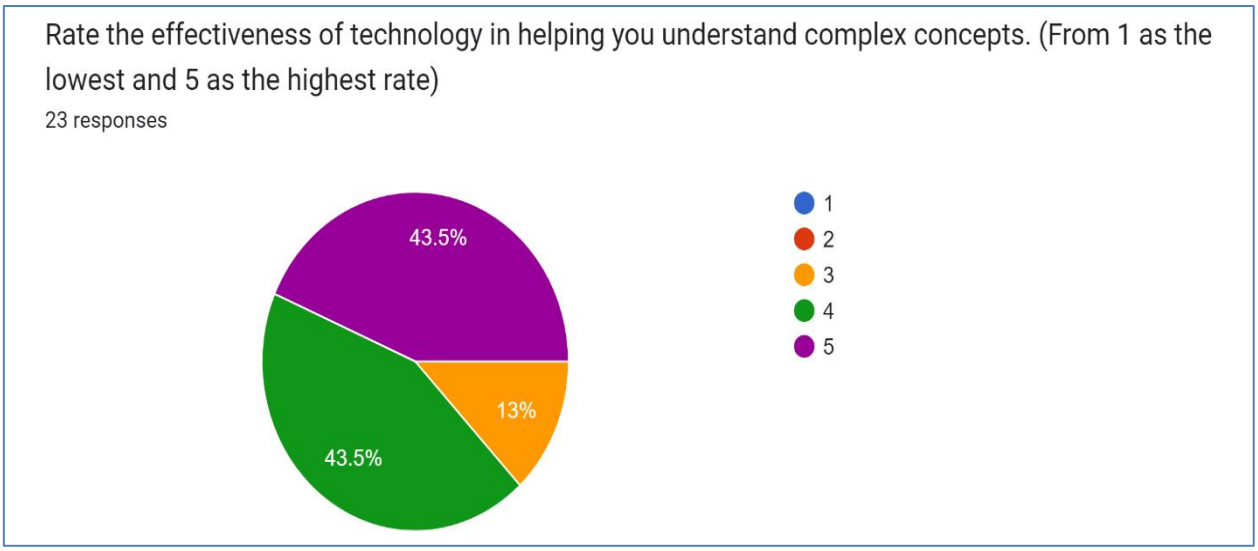

Fig. 4: Shows the effectiveness of technology tools in helping the students understand complex concepts.

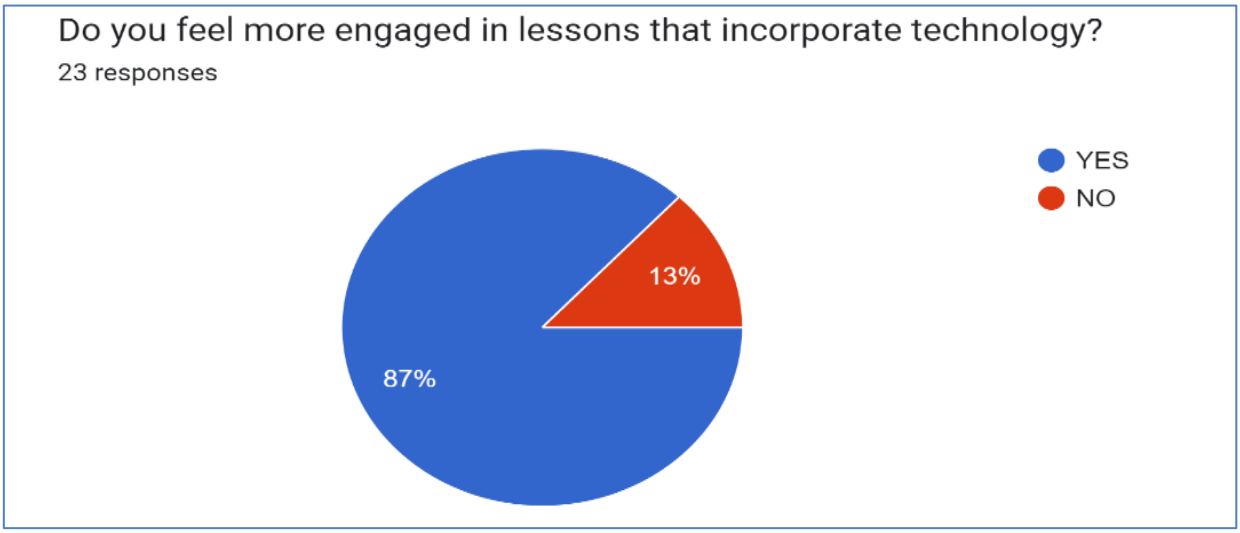

Fig. 4: shows how engaged students are with the lessons when technology tools are incorporated.

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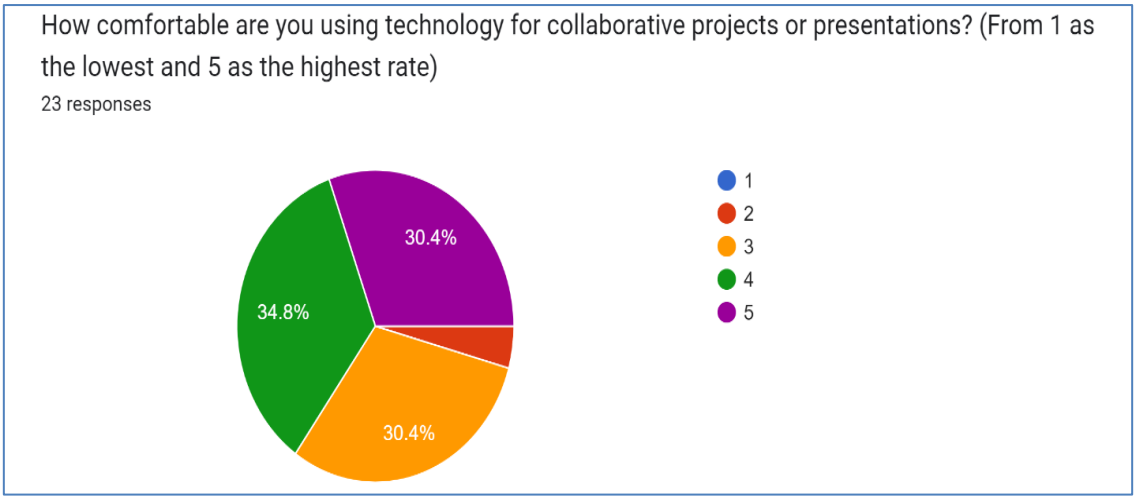

Fig. 5: Shows the comfort it gives to the students when technology tools are used for collaborative projects or presentations.

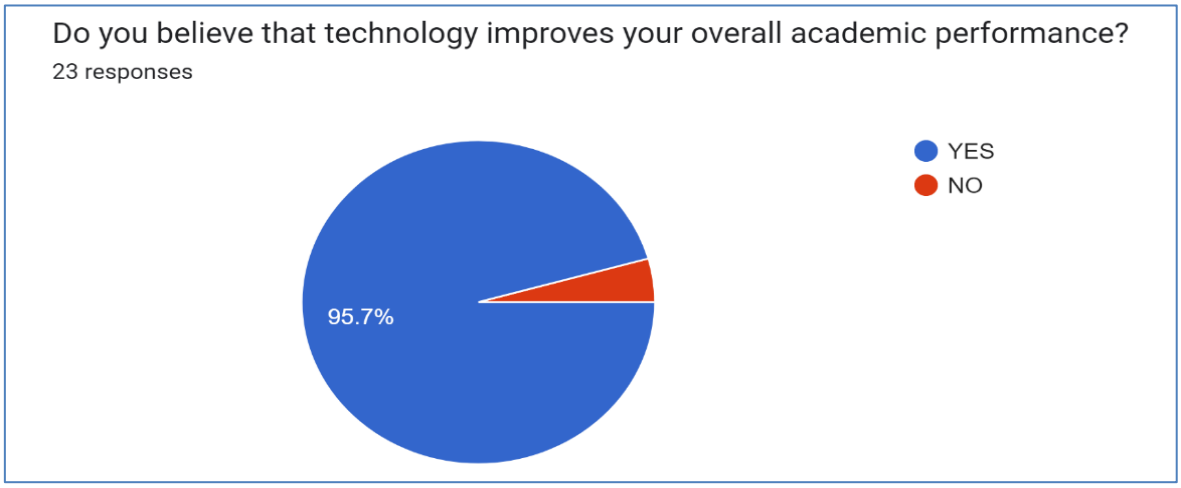

Fig. 6: Shows the belief of the students when technology tools are used to improve their overall academic performance

VII. RECOMMENDATIONS

Given this study, the team recommends that a continued Professional Development plan for a specific school in the context of the needs of the students must be enhanced focusing on technological skills and teaching methodologies. Educational Policies for allocating resources and infrastructure for effective technology integration in schools must be in place. Future research and development in technology integration and its impact on education must be considered during the institutional planning of school leaders to fully maximize its potential in integrating technology as the basis for the outcomes every school year.

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