Ch.3 Methodology This study used a quantitative research method to explore how Augmented Reality (AR) and Virtual Reality (VR) affect students' learning outcomes in upper grades. The research was conducted in several schools in Nablus. A questionnaire was designed and distributed to students and teachers in grades 7 to 10. The questions focused on their experiences with AR and VR in the classroom, how often they used these tools, and how it affected their understanding and motivation. 1. Study Sample and Location The study was conducted in two upper-grade schools located in Nablus, Palestine. One school implemented AR/VR technologies in their teaching methods, while the other relied solely on traditional teaching approaches. The sample consisted of 80 students (40 from each school), ranging in age from 13 to 15 years old, as well as 6 teachers who contributed insights through interviews. 2. Source of the Study Sample The sample was purposefully selected to include one school known for its integration of AR/VR tools and another with a conventional curriculum. Students were chosen from Grade 8 and Grade 9 to ensure a focus on learners who are cognitively mature enough to engage with immersive content. Teachers were selected based on their direct involvement in delivering the curriculum. 3. Procedures Employed in the Study The study followed a comparative case study approach. Data collection involved: Pre- and post-tests to measure learning outcomes in subjects such as science and geography. Student surveys to assess engagement, motivation, and confidence levels. Classroom observations using a structured checklist. Teacher interviews to explore perceptions of effectiveness and challenges. Data was analyzed both quantitatively (test scores, survey results) and qualitatively (interview and observation data) to draw comprehensive comparisons between the two educational environments. 4. Problem Addressing Strategy To address the research problem "Does AR/VR significantly impact learning outcomes in comparison to traditional methods?"—the study employed: A controlled comparison of two environments with similar student demographics. Triangulation of data sources (students, teachers, observations, test results) to enhance validity. Thematic analysis of qualitative responses to identify recurring patterns in engagement and understanding. Statistical comparison of pre/post results to determine the academic effectiveness of AR/VR use. Step1: Background of the Study Education systems around the world are starting to use new technologies to make learning more interesting and effective. In Palestine, especially in cities like Nablus, schools often face problems such as large class sizes, limited resources, and outdated teaching methods. These challenges may make it harder for students to stay focused and enjoy learning. Today, tools like Augmented Reality (AR) and Virtual Reality (VR) are becoming more popular in classrooms. These tools allow students to explore lessons in exciting and interactive ways. They can visit historical places, explore the human body in 3D, or perform science experiments without real risks. This kind of learning may help students stay more engaged and understand lessons better. Step 2: Statement of the Problem Many schools in Nablus coninue to rely on traditional teaching methods such as lectures, textbooks, and simple visual aids. While these methods can be effective, they may not be enough to meet the needs of today's students, who are growing up in a world full of technology and fast information. As a result, students may feel bored, unmotivated, or disconnected from their lessons. At the same time, some schools have started using modern tools like AR and VR to improve the learning experience. These tools offer interactive lessons that can increase student interest and understanding.

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However, there is still little research in Palestine about whether these technologies actually improve learning outcomes or if they are just an exciting trend with no limited impact. This study aims to explore this gap by comparing the performance and engagement of students in two schools—one that uses AR/VR and one that does not. The goal is to find out if these new technologies truly make a difference in how students learn and perform in school. Step 3: Purpose of the Study The main purpose of this study is to compare the learning outcomes between students in upper-grade classes who learn with AR/VR technologies and those who learn with traditional methods in Nablus schools. This research aims to find out if AR/VR tools actually help students understand lessons better, improve their academic performance, and increase their motivation in the classroom. By focusing on two different school settings—one using advanced technology and one using traditional teaching—this study will provide clear evidence about the real impact of AR/VR on education. The results may help teachers, school leaders, and decision-makers in Palestine decide whether it is worth investing in these new technologies for future classrooms. Step 4: Research Questions : This study seeks to answer the following questions: 1. What are the differences in academic performance between students who use AR/VR technologies and those who learn through traditional methods in upper grades? 2. How does AR/VR affect student motivation and classroom engagement compared to traditional teaching? 3. What are the opinions of teachers and students about using AR/VR in the learning process? These questions will guide the study and help reveal whether AR/VR is just a modern distraction—or a true key to unlocking better education in Palestine. Step 5: Significance of the Study : This study is important because it provides real evidence about the impact of modern technologies—Augmented Reality (AR) and Virtual Reality (VR)—on student learning in Palestinian schools. In a world that is rapidly changing, education must also evolve to keep up with the needs of young learners. However, schools in Palestine often have limited resources, so every investment must be based on strong evidence. By comparing two different learning environments, this study will help: Teachers understand if AR/VR can improve their students' learning and motivation. School leaders and policy-makers decide whether to introduce AR/VR tools in classrooms. Future researchers explore new ways to make education more interactive and effective in the Arab world. The results of this study may inspire more schools in Nablus and beyond to embrace technology—not just for the sake of innovation, but to create meaningful and lasting learning experiences. Conclusion and Recommendations: This study set out to explore the impact of Augmented Reality (AR) and Virtual Reality (VR) on student learning outcomes in upper-grade classrooms in Nablus. By comparing two schools—one using AR/VR technologies and one relying on traditional teaching methods—the research aimed to determine whether these innovative tools could improve students' academic performance, motivation, and engagement in the classroom. Summary of Findings: 1. Academic Performance: The results of the pre- and post-tests indicated that students who learned with AR/VR technologies showed a noticeable improvement in academic performance compared to their peers who learned with traditional methods. This suggests that AR/VR tools have the potential to enhance students' understanding and retention of lesson material. 2. Motivation and Engagement: Surveys and classroom observations revealed that students in the AR/VR group were significantly more motivated and engaged during lessons. They reported higher levels of interest in their studies and greater involvement in class

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activities. This highlights the potential of AR/VR to make learning more interactive and captivating. 3. Teacher Perspectives: Teachers shared positive feedback regarding the integration of AR/VR in their teaching. They noted that these technologies made lessons more dynamic and allowed students to visualize complex concepts. However, teachers also mentioned challenges such as the need for training and the limited availability of resources, which could hinder broader implementation. Implications of the Study: The findings of this study underscore the potential of AR/VR to revolutionize education in Palestine. By enhancing academic performance and boosting student motivation, these technologies could play a key role in modernizing the educational experience. The results also suggest that the use of AR/VR could help bridge gaps in learning, making difficult concepts more accessible and engaging for students. However, the study also highlights several challenges that need to be addressed before AR/VR can be widely adopted in Palestinian schools. These include the high cost of technology, the need for teacher training, and the lack of resources in some schools. Therefore, while the study suggests that AR/VR can be an effective tool for improving education, it also calls for careful planning and support from educational authorities to ensure successful implementation. Recommendations for Future Research: 1. Longitudinal Studies: Future research should consider conducting longitudinal studies to assess the long-term impact of AR/VR on student learning outcomes and engagement. 2. Larger Sample Sizes: Expanding the sample size to include more schools across different regions in Palestine could provide more generalizable results. 3. Teacher Training Programs: Research should focus on the development of training programs for teachers to ensure they are equipped to effectively use AR/VR tools in the classroom

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