

How fotonVR Transformed Science Education with Virtual Reality: A Case Study

Introduction:

Science is a fascinating subject that can spark curiosity and creativity in students. However, many students find it difficult to grasp the abstract and complex concepts of science through traditional methods of teaching and learning. Moreover, the lack of practical exposure and hands-on experiments can make science education tedious for students.

FotonVR, a virtual reality (VR) startup, is using VR technology to make science education more engaging and enjoyable for students in grades 1-10. Its VR science lab allows students to explore complex scientific concepts in a safe and interactive environment. FotonVR believes that VR can help students learn science more effectively by making it more immersive, interactive, and fun.

The goal of this case study is to show how fotonVR's VR lab setup at Maratha Mandal English



Medium School in Belgaum enhanced the academic performance and interest of its students in science subjects.

Methodology :

fotonVR's VR lab was installed and integrated into the school's curriculum and teaching methods in the following way:

- The school allocated a dedicated space for the VR lab, where students could access fotonVR's VR headsets and content.
- fotonVR's support team also trained its teachers on how to use fotonVR's VR content and incorporate it into their lesson plans and assessments.
- The school scheduled 1-2 sessions per week for each class and group of students to use the VR lab as part of their science education.
- FotonVR's content is multilingual, Maratha Mandal School conducted their sessions in Hindi and English language. The school conducts a session before starting each chapter in the classroom.
- The school followed the CBSE syllabus for science subjects and used fotonVR's VR content that is aligned with the [NCERT curriculum](#) and covers all science topics for standard 1st-10th. FotonVR has 550+ science activities that cover all the topics of science subjects for standards 1 to 10.
- The school encouraged students to explore various virtual tours, interactive learning activities, and VR-based practicals that fotonVR provides for each science topic.
- The school monitored the progress and performance of each student using fotonVR's dashboard app, which allows school authorities to track children's learning outcomes and feedback.



FotonVR's VR content is designed to provide students with a 3D and 360° environment where they can experience science concepts realistically and engagingly. For example, students can:

- Travel inside the human body and learn about the anatomy and functions of different organs and systems.
- Perform experiments in the chemistry lab and learn about the properties and reactions of different elements and compounds.
- Visit outer space and learn about the planets, stars, and other celestial bodies in the solar system and beyond.
- fotonVR's VR content also allows students to interact with the objects and phenomena in the virtual world, such as: body parts, components of labs, chemicals bonds and its structure etc
- Observing the effects of different variables on biological processes such as photosynthesis, respiration, etc.

fotonVR's VR content is not only experiential but also educational, as it provides:

- Clear explanations and definitions of key terms and concepts.
- Relevant examples and applications of science concepts in real-life situations.
- Quizzes and questions to check the understanding and retention of students.

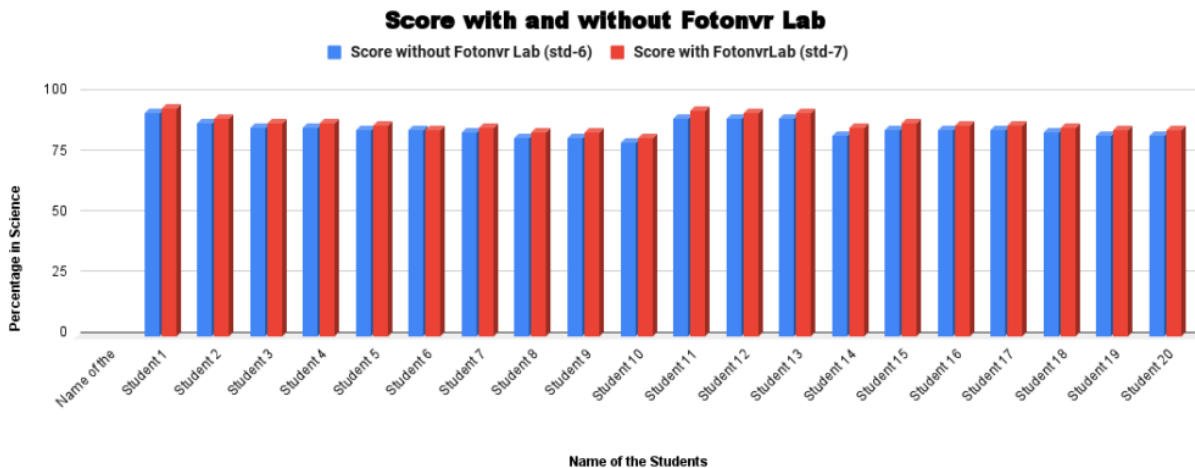
Results :

After using fotonVR's VR lab for some time, the school reviewed its students' results and found significant improvements in their academic performance and interest in science subjects.

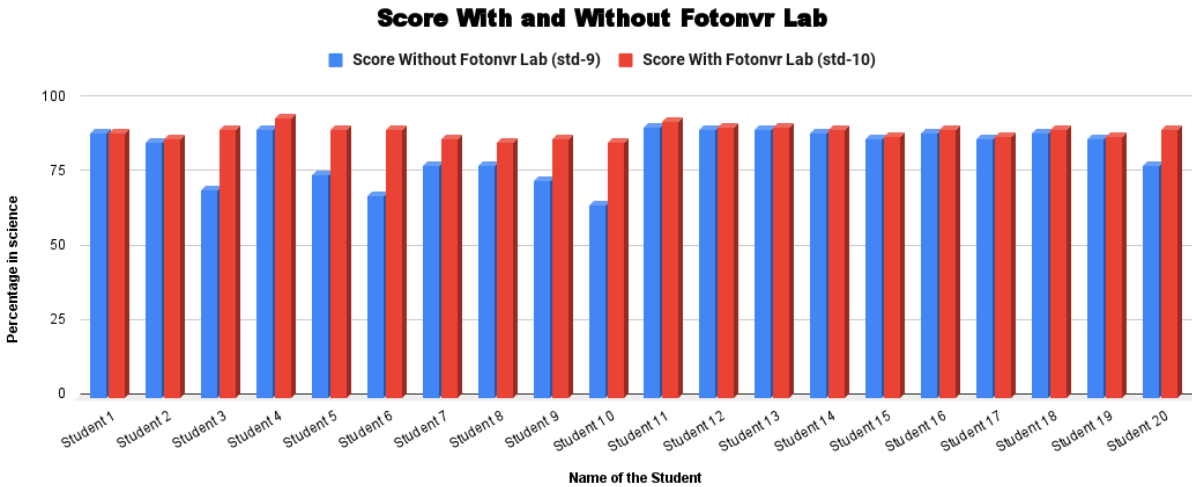
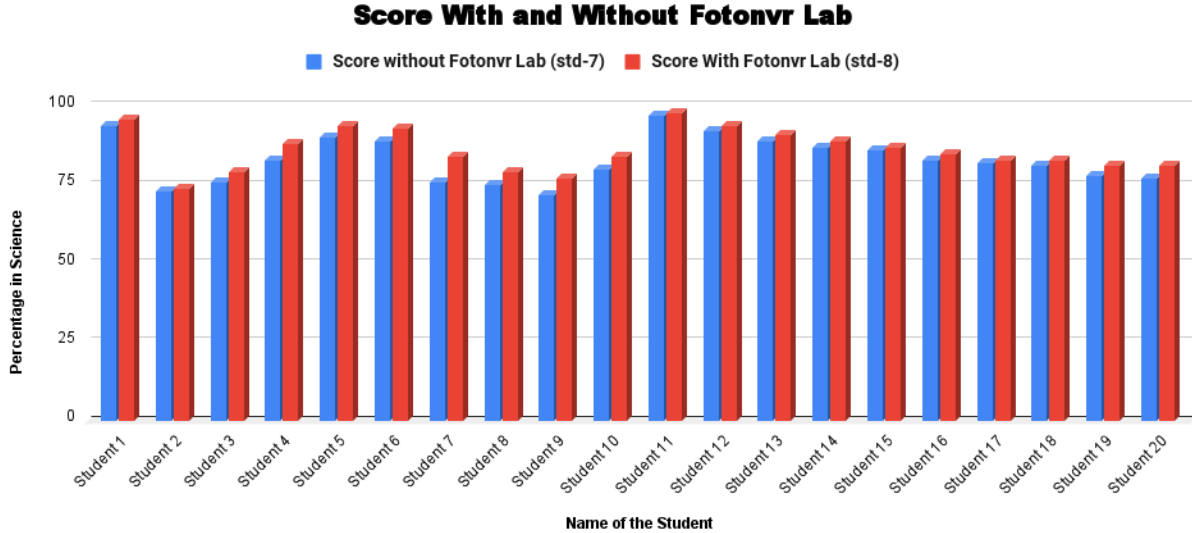
To measure the outcome the school collected marks of their students' science subject for the academic year 2021-2022 (for the duration before the implementation of the fotonVR lab) and academic year 2022-2023 (after the implementation of the fotonVR lab).

Some of the key findings are below.

The percentage in standard 7, when they have a fotonVR lab in the school, has increased by 2.05 average marks, compared to their marks in standard 6 when the school does not have a fotonVR lab. Student-wise comparison of their marks is well described in the below chart. Here, the red color bar is for the year 2022-23, when the school is having FotonVR lab (The names of students are replaced with student 1, and student 2... maintaining the privacy of the students).



fotonVR Transformed Science Education with Virtual Reality For standards 8 and 10, the school has observed an even better increment in the result. Students who are in standard 8 have gained an average of 3 marks more compared to their marks in standard 7 and standard 10 students gained 6.80 more marks compared to the previous year. In the graph of class 10, you can observe a significant improvement of up to 15 marks in many students. Here we can see that all the students have improved their scores or maintained the same level but a decrease can be seen in the student's marks.



Reports of students:

- The students said that they understood science concepts better with [fotonVR's VR content](#) than with traditional methods of teaching and learning.
- The students expressed more curiosity and enthusiasm for exploring science topics further with fotonVR's VR content.
- The students reported that they enjoyed learning science with fotonVR's VR content more than with textbooks or videos.

Reports from teacher:

- The teachers noticed that the students were more attentive and participative in class discussions and activities after using fotonVR's VR content.
- The teachers said that they were able to explain science concepts more effectively and efficiently with fotonVR's VR content than with conventional tools.

Conclusion:

The case study shows how fotonVR's VR lab setup in Maratha Mandal English Medium School of Belgaum transformed science education for its students. By providing immersive and interactive educational content in the form of virtual science labs, fotonVR enhanced student engagement and retention of science concepts. Moreover, fotonVR stimulated student curiosity and creativity in learning science. As a result, fotonVR improved student learning outcomes in science subjects.

The case study also suggests some recommendations or suggestions for future research or improvement, such as:

- Evaluating the long-term impact of fotonVR's VR lab setup on student learning outcomes and career choices in science fields.
- Expanding fotonVR's VR content to cover other subjects and topics, such as mathematics, social studies, languages, etc.