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**CONFERENCE ARTICLE**

**Engaging Students in International Online Research Platforms**

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**Abstract:** This thesis provides a comprehensive overview of the advantages of engaging students in online platforms.

**Keywords:** Quantum computer, algorithms, transistors, energy bands.

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**Introduction**

Engaging students in international scientific projects and collaboration programs is of great importance for developing their scientific research abilities. For example, through platforms such as CERN Open Data Portal, IEEE Xplore, ScienceDirect, Google Scholar, and ResearchGate, students can become familiar with international scientific research and develop their own independent scientific projects using open scientific data. In addition, there are opportunities to participate in international scientific projects such as MIT UROP (Undergraduate Research Opportunities Program), the NASA Internship Program, and the European Space Agency (ESA) Internship Program.

With the development of modern science and technology, innovative methods are increasingly being applied in the field of scientific research. Artificial intelligence and machine learning technologies enable students to automate scientific research and model physical processes in depth. With the help of MATLAB, COMSOL Multiphysics, and TensorFlow, it is possible to evaluate the electrical properties of semiconductor materials, model the movement of charge carriers, and optimize the operating efficiency of semiconductors.

Setting up laboratories using IoT technologies gives students real practical experience in working with semiconductor devices. With the help of Arduino, Raspberry Pi, and ESP modules, there are opportunities such as creating sensor systems, processing electrical signals, and remotely monitoring data on an IoT network. This stimulates the development of new projects in the fields of electronics and automation.

Quantum computer technologies and the study of quantum dots are an important stage in creating a new generation of computing systems based on semiconductors. Through the IBM Q Experience and Google Quantum AI platforms, students will have the opportunity to develop quantum algorithms, study the operating mechanisms of quantum transistors, and model quantum conductivity phenomena.

Open-source simulation programs (Silvaco TCAD, OpenFOAM, Quantum Espresso, LAMMPS) provide students with the opportunity to understand the quantum mechanical properties of semiconductors, model energy bands, and calculate quantum tunneling and electron scattering. These programs are an effective tool for conducting research, modeling scientific results, and testing theoretical knowledge in practice.

Engaging students in international scientific research platforms creates opportunities to develop their theoretical and practical knowledge, expand scientific collaboration, and participate in international scientific projects. Through platforms such as CERN Open Data Portal, IEEE Xplore, ScienceDirect, and Google Scholar, students will have the opportunity to study scientific articles, join international scientific research, and create projects based on new innovative developments.

Using advanced technologies, international scientific resources, and open-source simulation programs to develop scientific research activities creates great opportunities for students. This helps them put their scientific knowledge into practice, learn new technologies, and find their place in the international scientific community.

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