Exhibit P9.9: National Policies Regarding the Use of Technology in Physics Instruction and Assessment

Reported by National Research Coordinators

Country	Description of National Policies for Technology Use in Physics Instruction	Description of National Policies for Technology Use in Physics Assessment
France	Official curriculum documents encourage Technology Enhanced Teaching (TET) and provide specific suggestions for developing digital skills. Graphing and programmable calculators are frequently used in instruction.	Graphing and programmable calculators are allowed during national examinations.
Italy	No policy. The national curriculum mentions experimental activities in general, but not specifically the use of technology.	Only scientific calculators are allowed during physics tests or examinations. Programmable calculators are not allowed.
Lebanon	No policy	No policy
Norway	Digital skills in physics involve carrying out relevant experiments in the main subject areas and analyzing and assessing mathematical models for physical situations, with and without digital tools.	The written exam in Physics 2 is divided into two parts. The first part (2 hours) is solved by pen and paper only; no technological aids are allowed. The second part (3 hours) allows the use of all aids which cannot communicate, including computers without access to the Internet.
Portugal	In some subjects, laboratory practices are taught/exemplified with graphing-scientific calculators and computers equipped with simulation software.	Some items in physics examinations require the use of a graphing-scientific calculator.
Russian Federation	No policy. Teachers may choose methods and technologies for instruction.	In the national examination (USE) in physics or regional physics tests, students may use only non-programmable calculators.
Slovenia	Physics lessons should be complemented and enriched by the use of computer technology. Lessons should use a computer interface and a set of sensors and measuring systems for capturing and processing the data and as a tool for the analysis and presentation of measurement. Available technology should never replace good demonstrations or laboratory techniques.	No policy. However, calculators can be used on the Matura examination which enable basic calculations and do not support connecting to the Internet, storing pre-loaded data, symbolic computation, programming new functions, or graphing functions.
Sweden	The national curriculum contains one statement explicitly referring to the use of technology in physics instruction, which dictates that students be given opportunities to use technology to collect, simulate, calculate, process, and present data.	No policy
United States	Policies vary by state, but most include standards requiring students to use technology in laboratory courses and use computers or graphing calculators for simulations, modeling, and data analysis. Both AP and IB courses require students to have access to the Internet, electronic sensors for collecting, analyzing, and processing data, and software for laboratory experiments.	Policies vary by state, but some states require students to use calculators in physics examinations. Programs (such as AP and IB) have their own specifications about what kinds of calculators are permissible.

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS Advanced 2015