Contribution ID: **14** Type: **Poster**

Using a Mobile Phone as a Measurement Tool for Illuminance in Physics Education

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Mobile phone ownership is commonplace in the Czech Republic. Proposals for experiments or measurements using a mobile phone in physics education appear in journal articles, professional journals and qualification papers.
The aim of this paper is to critically assess the data obtained with a mobile phone in comparison with laboratory technique. The paper focuses on the issue of using a mobile phone as a luxmeter, colorimeter and luminance meter.
The measurements were performed on an optical bench with a rotating holder with an angular scale in a darkroom where daylight illumination of the luxmeter was minimized. Four laboratory luxmeters, 8 mobile phones, 2 school measurement system sensors and 6 mobile apps were used for comparison. Along with the laboratory luxmeters, a high-speed camera and video analysis were also used.
General conclusions can be drawn from the measurement results:
- For any measurement with a mobile phone it is essential to calibrate the app with a professional luxmeter.
- Different mobile apps measure identically with the same mobile phone.
- The same app measures differently on different phones.
- Most mobile phones measure satisfactorily at distances between 50 cm and 150 cm from the light source.
- Some mobile phones can be used to take measurements even when they are rotated up to 30° to the light source.
- Most mobile phones react to a change in illuminance value within 0.5 s.
- Most mobile phones also respond to ultraviolet and infrared radiation.

When comparing mobile phones with a luxmeter, it was found that a mobile phone can replace a luxmeter in selected situations in education, but current mobile phones cannot replace a luxmeter in engineering practice.

Contribution categories - primary focus

Primary and secondary school

Contribution categories - type

Application (shared experience, activity suggestions)

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