

# Up, up and away, in the name of science education

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US researchers extol the virtues of high-altitude balloons for science education in a research paper published in the *International Journal of Learning Technology*. According to Jeremy Straub of the University of North Dakota in Grand Forks, "High-altitude balloons can carry student and scientific payloads to the boundaries of space."

This, he suggests, gives students the opportunity to carry out experiments in a cold, near-vacuum, higher-radiation environment at such very [high altitudes](#). "In the process, students experience the awe of [space exploration](#) as, through their payloads, they are able to view the curvature of the Earth and capture images as inspiring as those taken from the Space Shuttle or the International Space Station." Moreover, experiments carried to high altitude in this way might help students to better grasp known principles or be original [scientific experiments](#): allowing students to research and explore the unknown.

Straub suggests that high altitude balloons are ripe for exploitation in [science education](#) and beyond but that there is a need for a formal design framework for high-altitude ballooning. There is also a need for a framework to make this technology more effective in undergraduate university courses, for instance, through a standard approach to improving payload design.

"The function of a high-altitude balloon is incredibly simple: it lifts objects towards the upper boundary of the Earth's atmosphere," explains Straub. They are used on a twice-daily basis by some 700 weather-

forecasting locations around the globe. Balloons have also been used to flight test spacesuits and other space technology and for various scientific endeavors, including simply dropping payloads to Earth for gravitational exploratory work, for example.

Such [high-altitude balloons](#) might reach altitudes of between 18 to 37 kilometers above the sea level, while record-holding balloons have stretched this reach to over 50 kilometers. "The rate at which it does this and how long it remains aloft are functions of the level of inflation and type of balloon chosen," points out Straub. "While the functionality of the balloon may be simple, the learning results that can be attained vary significantly. The value of the balloon is the opportunity for access to near-space that it presents and the chance to enhance student creativity and enthusiasm."

**More information:** Straub, J. (2015) 'Evaluation of high-altitude balloons as a learning technology', *Int. J. Learning Technology*, Vol. 10, No. 1, pp.94-110.

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