FLYING LABORATORIES IN AVIATION EDUCATION PROCESS

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Abstract: An aviation education process has been linked very tightly with development of aviation knowledge and industry for years. Most of both typical and unique aviation technologies have been employed for education since very beginning of the aviation age. There is nothing extra ordinary in the fact different types of flying vehicles (kites, balloons, airplanes, helicopters, multicopters etc.) have been employing as platforms hosting scientific and didactic facilities. Scientific experiments and didactic presentations carried out with the usage of "flying laboratories" always have been making research and educational activity more interesting and efficient. Moreover educational activity has been much more attractive for students if in-flight experiments and demonstration have been conducted. Currently educational activity employing all above-mentioned flying vehicles operated as manned vehicle, Remotely Piloted Aircraft System - RPAS, Optionally Piloted Vehicle - OPV also helps students and scientists better understand physical phenomena and give them more solid basis of got knowledge.

The paper presents such some samples of flying laboratories used at several educational activities involving students regular laboratories, student projects, doctoral works etc. as:

- PA-34 - flying laboratory - modified Piper Seneca V aircraft. The Airplane is equipped with dedicated flight parameters measurements and recording system. The lab has been used for preparation of student final projects covering such objectives as: flight parameters analyses, aircraft dynamic identification, for years.
- LOT - is RPAS and OPV laboratory. It consists of two parts: An air-born part is facilitated with dedicated measurement and data recording systems as well as remotely controlled camera with video data link helpful in several types of experiments. A mobile Ground Control Station (GCS) with stands for mission engineer and remote pilot is installed on the board of off-road vehicle. Students are helped by the system in educational experiments as well as research projects, they conduct.
- Regular (not modified) gliders and airplanes - equipped with portable devices and facilities are perfect for aviation experiments not requiring any extra equipment and systems. Simple, however efficient student-made avionic gadgets get employed for student experiments. Some aircraft characteristics e.g. speed characteristics, air-brake efficiency, global G-force affecting the pilot etc. have been investigated so far.

The paper uses these samples to give readers general overview of some technologies, equipment, staff requirements, operational and technical constrains, software and hardware tools and many other items could be applied to successfully complete some aviation educational activity.

There are many profits get provided by flying laboratories involvement into educational process. The paper aims to outline them. Some specific benefits are presented and discussed in this paper also.