

# Lights, Camera, Interaction

**E-learning brings advantages compared with classroom instruction, but courses must be carefully designed.**

BY RICK DARBY

## BOOKS

### Performance-Based Learning

#### e-Learning in Aviation

Kearns, Suzanne K. Farnham, Surrey, England, and Burlington, Vermont, U.S.: Ashgate, 2010. 194 pp. Figures, tables, references, index.

Aviation training needs a new paradigm, Kearns says. It is no longer enough, she believes, to “sort” learners — those who pass from those who fail, those who get better grades from those with worse grades, the sheep from the goats. That kind of instruction, she says, was “more focused on following procedures than on decision-making or problem-solving skills. However, the training needs of the industry have advanced. The increasing congestion of airspace, advanced technology in the cockpit and an influx of low-time pilots into the airline sector present unique training challenges. ... It has become evident that a mastery of standard operating procedures is insufficient preparation for every possible situation, as anomalies arise and pilots must possess the critical thinking skills necessary to solve complex and novel problems.”



To develop critical thinking ability, all learners must be given the time and training to reach their maximum level of performance, rather than just attaining a baseline, Kearns says. She argues for performance-based learning: “Rather than providing student pilots with a predetermined number of practice hours on certain maneuvers or phases of flight training, as mandated by current regulations, performance-based training allows training to be tailored to the skill of each student. Students receive practice on skills they are weakest in and do not waste time on areas they have already mastered. Regulators worldwide are opening regulatory doors for this approach, allowing high-quality flight training institutions an alternate means of complying with pilot licensing requirements.”

Such flexible, adaptive instruction would require almost a one-on-one interaction between instructor and student under conventional training, and be prohibitively expensive. “However, with electronic learning (e-learning), it is a feasible option,” Kearns says.

E-learning provides educational materials and computer-mediated communication (CMC)

through electronic means, primarily the Internet or an organization's intranet — an alternative to classroom instruction. Delivery methods fall into three broad categories, Kearns says:

**Synchronous.** “Learners and an instructor log into a virtual classroom simultaneously at a predetermined time from their separate locations.” Some kind of CMC is involved, such as a webcam and a headset with a microphone, or instant messaging software.

**Asynchronous.** “Asynchronous e-learning, by comparison, is completed independently by each user. Although CMC may be used, it is in the form of an electronic mailing list or message board in which learners post comments to a forum for classmates and the instructor to review at a later time. Students interact with peers and their instructor by reading and commenting on each other's posts.”

**Blended learning.** “Stand-alone synchronous or asynchronous approaches do not always meet the needs of learners or instructors. Therefore, a combination of e-learning (either synchronous or asynchronous) and traditional classroom instruction is often used.”

Blended learning uses e-learning to support, not replace, classroom instruction. “Some aeronautical universities have recently introduced blended learning courses,” Kearns says.

She cites advantages of e-learning, compared with classroom instruction:

- Cost-efficiency;
- Geographic flexibility, with the course available in any location;
- Training that is available any hour, any day;
- Content that is standardized among instructors across an entire organization;
- Interactive exercises;
- Standard software, so almost any computer can run the training identically;
- Immediate learner feedback, tailored specifically to performance; and,

- Automatic tracking of learner performance with a company-wide database.

“E-learning revolutionizes how instructors interact with students,” Kearns says. “In a classroom setting, it is common for a small handful of students to answer all of the instructor's questions. Unfortunately, the instructor has no way of determining if the others in the class are keeping up with the material or are hopelessly lost until they encounter a quiz or a final exam. The interactivity of e-learning allows instructors to assess and track performance more frequently and to intervene when a student is falling behind.”

Still, these benefits will be diluted unless the e-learning is built on a sound instructional design, tailored to the needs of the student and the organization. “There is a very wide range of quality in e-learning programs,” Kearns says. “In fact, when researchers review the effectiveness of e-learning compared to classroom instruction, they find that some computer-based courses significantly outperform their classroom-based counterparts. However, an equally large percentage of e-learning courses significantly underperform classroom-based training.”

There are disadvantages to e-learning as well. Kearns says, “Course design, creation and implementation can cost more than the projected savings. Learners require a higher level of motivation and self-direction. Learners lose direct contact with their instructor in asynchronous learning environments, or [lose] nonverbal cues such as body language and voice inflection in synchronous learning environments.”

To be fully effective, e-learning course developers cannot just take a traditional classroom course or PowerPoint slides and send them over the Internet. “The entire premise must be rethought,” Kearns says. “Companies that are eager to save training costs jump on the e-learning bandwagon without fully understanding how to make this type of training effective.”

No technology can take the place of well-qualified human instructors, she adds. Ideally,

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the electronic medium provides a way to use the instructor’s abilities more efficiently. “The best way to maximize the strengths of e-learning is through careful instructional design and an understanding of which attributes have been shown to improve learning, and which [attributes] are probably ineffective,” Kearns says.

**REPORTS**

**Ash Cloud Computing**

**Flight in Airspace With Contamination of Volcanic Ash**

European Aviation Safety Agency (EASA). Safety Information Bulletin (SIB) 2010-17R3, May 23, 2011; revised by SIB 2010-17R4, May 24, 2011. The latter is available via the Internet at <ad.easa.europa.eu/ad/2010-17R4>.

The most significant volcanic eruptions so far in 2011, of Iceland’s Grímsvötn volcano in May and the Puyehue volcano in southern Chile in June, have been kinder to aviation than April 2010’s blast from the Eyjafjalajökull volcano, also in Iceland. Not only are this year’s events easier for non-Icelanders to pronounce, but neither has caused anything like the numbers of airport closures and flight cancellations that followed Eyjafjalajökull’s eruption (ASW, 11/10, p. 12). No one is counting on nature’s continued benevolence, however.

EASA has been actively involved in new and updated guidelines for responding to large-scale volcanic activity. Besides participating in a simulation exercise involving airlines, air navigation service providers, regulatory authorities and other organizations (ASW, 4/11, p. 11), the agency issued the May 23 SIB, followed the next day by a successor with slight modifications. The documents are advisory, not mandatory.

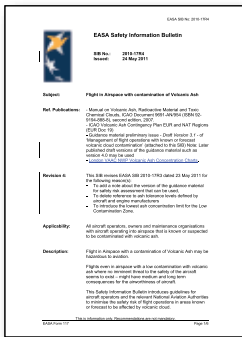
The May 23 SIB revises charts published by the London Volcanic Ash Advisory Centre (VAAC). “The charts show forecast ash concentration levels in three altitude bands and in three different zones,” the bulletin says. Areas of “low contamination” are displayed in blue-green. Areas of “medium contamination” are shown in gray. Areas of “high contamination” are displayed in red. These terms replace the previously used terms “enhanced procedure zone,” “time-limited zone” and “no-fly zone.”

The SIB introduces guidelines for aircraft operators and civil aviation authorities to minimize safety risks of flight in areas where volcanic cloud is known or forecast. Recommendations for operating in an area of low contamination include the following:

- “Accomplish daily inspections when operating in an area of low volcanic ash contamination to detect any erosion, accumulation of volcanic ash or aircraft and/or engine damage or system degradation.”
- “Protect and cover aircraft that are parked in areas that may be contaminated by the fallout or settling of volcanic ash in accordance with the aircraft and engine TC [type certificate] holder’s advice where possible. Any volcanic ash residues must be removed prior to operations and following the TC holder’s recommendations where available.”

Additional recommendations apply to flight in medium or high contamination areas, “subject to the approval of the competent authority of the EU [European Union] member state or associated country.” Two procedures are recommended.

- “Operators may be authorized to resume flight operations in areas or airspace with a medium or high contamination by presenting to their national competent authority an acceptable safety case.” The bulletin references the International Civil Aviation Organization International Volcanic Ash Task Force guidance, “Management of Flight Operations With Known or Forecast Volcanic Cloud Contamination,” draft version 3.1, published as an attachment to the SIB.
- “The national competent authority of the member state or associated country may decide to allow all flights within the area or airspace with a medium contamination, with or without limitations (e.g., geograph-



ic area, limitation in duration) following reconnaissance/clearance flights performed to support and justify that safe operations in the area or airspace with medium contamination can continue. This airspace, based on reconnaissance/clearance flights, should then be reclassified as an area or airspace with a low contamination.”

In either case, flights may then be carried out at the operator’s discretion “provided flight into visible ash is avoided.”

The May 24 SIB introduces the lowest ash concentration limit for the low contamination zone and deletes the sentence, “The [ash concentration level] zones are based on volcanic ash tolerance levels defined by aircraft and engine manufacturers to ensure continued safe flight.”

**WEB SITES**

**Written on the Fly**

**Flight Level 390, <flightlevel390.blogspot.com>**

This blog is written by “Captain Dave,” who describes himself as “a middle-aged airline pilot with a growing bald spot.”

In “Flight Level 390” — subtitled “America From the Flight Deck” — the captain describes flights he conducts, salted with observations and opinions.

Postings about flights are prefaced with identifying details that pilots will relate to, for example:



Position: SAE (Searle VOR; Ogallala, Nebraska)  
 Altitude: 32,000 ft  
 Groundspeed: 415 kt (477 mph)  
 Compass Heading: 278 degrees  
 Equipment: A321 Enhanced  
 Pax on Board: 183 + 5 jumpers  
 Airborne ... Day number three of four.

The captain writes:

“We have been paralleling a line of Level Six thunderstorms for hundreds of miles and it appears to stretch all the way to the Rockies. The 321’s multi-scan digital radar shows a clear depiction of those gigantic atmospheric water pumps to our left; to our right, another area of Level Six storms in a circular cluster about 200 mi [322 km] in diameter. In between is a hole about 75 mi [121 km] across; that is where we are, over SAE, along with many other airliners. The blow-off from the storm tops to our left has filled the gap with IMC (instrument meteorological conditions). We cannot see a thing outside except a gray nullity; no shape or form.”

Many of his postings concern the human dimension of piloting:

“My copilot is a 30-something guy that captains either love or hate. About half of my buds do not care for this guy, but I have no complaints. I have flown with him numerous times over the eight years he has been on the line and I do not see the problem. He is high-strung and very intelligent, one of the best aviators on the Line. Therein might lie the problem ... . Not hard for such copilots to make the captain’s flying look ham-fisted. When I have copilots like this, I give them all the flying; keep them busy and everyone is happy.”

The captain’s opinions on anything that comes to mind are frequently entertaining, sometimes funny. But for many readers, his word pictures of the in-flight environment will be most striking. Over Johnstone Point, Alaska:

“On the other side of the heated Plexiglas ... Extremely thin atmosphere, brilliant star fields and the aurora borealis. It is exceptionally active tonight. The cosmic streamers are undulating like electric snakes. Somehow, though, it is appropriate; an electric jet in an electric sky.”