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Elizabeth L. Blickensderfer

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# LEARNER CENTERED DEBRIEFING IN GENERAL AVIATION TRAINING: QUESTIONS FROM THE FIELD AND ANSWERS FROM RESEARCH

Elizabeth L. Blickensderfer  
Embry-Riddle Aeronautical University  
Daytona Beach, FL

Recently, the “Learner Centered Grading” (LCG) debriefing strategy has been introduced to general aviation flight training. LCG includes two parts: learner self assessment and a detailed debrief led by the instructor. The purpose of the self assessment is to stimulate growth in the learner’s thought processes and, in turn, behaviors. Implementing a training strategy in the field, however, is different from laboratory tests. In an effort to see how the learner centered grading debrief was being used in the field, in-depth interviews with 10 certified flight instructors (CFIs) were conducted. Overall, the CFIs reported that the in-depth discussions were an improvement over traditional instructor-led debriefings. Difficulties, however, were also evident, and a variety of questions and observations were noted ranging from the varying accuracy of the self-assessments to issues with transitioning instructors to use this new style of debrief. The purpose of this paper is to discuss the learner centered grading style debrief, present findings from the interviews with CFIs, and offer recommendations drawn from research on self-assessment and metacognition, as well as applied research on debriefing accomplished in the U.S. Navy shipboard environments.

## Introduction

Although aviation has moved into a technologically advanced era, flight training has largely stayed the same. Emphasis on stick-and-rudder skills and repetition of standard flight maneuvers may not be the most effective strategy to train pilots to fly the new technologically advanced aircraft (TAA) (FAA, 2006). In response to this need, the FAA/ Industry Training Standards program (FITS) was born. FITS is not a regulatory entity, but rather a voluntary collaboration of industry leaders representing aircraft manufacturing, training, universities, insurance companies and trade associations, as well as the General Aviation Center of Excellence and the United States Federal Aviation Administration (FAA, 2006). The FITS team has been working together to develop training guidelines that fall within the boundaries of current regulations and yet incorporate the latest findings in training research.

Briefly, the FITS approach utilizes a scenario-based training strategy, wherein flight instruction is given in the form of realistic scenarios. One component of the FITS method is to use the concept of “learner-centered grading” following each flight scenario. Learner centered grading (LCG) includes two parts: learner self assessment and a detailed debrief by the instructor. The purpose of the self assessment is to stimulate growth in the learner’s thought processes and, in turn, behaviors. The self-assessment is followed by an in-depth discussion between the instructor and the student which compares the instructor ratings to the student’s self-assessment. Thus, the debriefing process changes from an instructor-led critique of performance to a student-led

and instructor-facilitated analysis of the student’s performance. Previous laboratory research (French, Blickensderfer, Summers, Ayers, & Connolly, 2005) indicated that the FITS approach, including the notion of learner centered grading, is effective for training certain skills.

Implementing a training strategy in the field, however, is different from laboratory tests. The purpose of this effort was to examine how the learner centered grading debrief was being implemented in the field and to discuss lessons learned in prior research on related debriefing strategies. This includes lessons learned in basic research on self-assessment and metacognition, as well as applied research on debriefing methods used in the U. S. Navy shipboard environments.

## Method

### Participants

Ten certified flight instructors (CFIs) for instrument aircraft were interviewed. The instructors represented three private companies (two aircraft manufacturers and one aviation training company). The individuals’ total number of flight hours ranged from 1200 to 3800, and the average number of flight hours was 2200 (SD = 946). The individuals’ experience as flight instructors ranged from three years to thirty years with an average of 8.61 years (SD = 8.5). Dual given hours ranged from 1002 to 3200 with an average of 1713.75 hours (SD = 786). All participants were certified flight instructors for instrument aircraft. In addition, eight of the individuals had multi-engine ratings, and two had

airline transport pilot certificates. The experience in using the FITS approach ranged from having trained two to 300 students using the FITS approach with an average of having trained 127 students (SD = 112) using the FITS approach. Two of the instructors had also developed curriculum based on the FITS strategy.

**Procedure**

Interviewees were solicited from industry partners in the FITS program. Prospective interviewees were informed of the purpose of the interviews and given sample interview questions (see Appendix A). To promote the elicitation of honest, candid responses, all interviewees were ensured that their responses would remain anonymous. Interviews were conducted via the telephone. Each interview lasted approximately 1 hour. All except three of the interviews were conducted by a team of two interviewers. The remainders were conducted by an individual interviewer. Interviews were not audio-taped, and exact transcription was not possible. The interview questions are shown in Table 1.

Example Interview Questions
<ul style="list-style-type: none"> <li>• Please describe your debriefing process prior to FITS</li> <li>• With the FITS training now implemented, is there a debriefing component used currently? Please describe.</li> <li>• What changes to the debriefing have you noticed between the former training and the new?</li> <li>• What changes to the debrief have you noticed as the FITS training evolves in your organization?</li> <li>• How much time do you think the debrief takes, on average?</li> <li>• Do you think that the debriefing procedures associated with this training are standardized among all instructors? Among every instance of the training, even with the same instructor?</li> <li>• How would you rate the effectiveness of the debrief?</li> <li>• If you were to design a new debriefing procedure, what would you be sure to include?</li> <li>• What is your understanding of Learner-Centered Grading?</li> <li>• Do you think the implementation of Learner-Centered Grading is difficult? Why or why not?</li> </ul>

**Results**

**Traditional Debrief vs. LCG Debrief**

First, the interviews indicated a difference between the LCG the approach as implemented by the CFIs interviewed and the previous debriefing strategy.

In general, interviewees reported that their prior debriefing processes were one sided and highly instructor led. They were short (no more than 15 minutes), and not standardized. For example, responses regarding the traditional debriefs included:

- The IP gave a “lecture” of what was right and wrong.
- The students tended to be exhausted (due to learning new things, stress, noise in aircraft) and not listening.
- The IP asked students to self-assess only if they reacted poorly to debriefing.
- The student and instructor had the mentality that the “Instructor knows and student doesn’t.”
- The IP informed students of good or not so good things they did with the goal of setting up for next lesson.

Other comments regarding the traditional debriefs included:

- The debrief occurred while taxiing in.
- The IP used a guide, syllabus, or took notes to help keep on track during the debrief.
- While instructing at universities, IPs were frequently on a tight time schedule with very limited time for the debrief.
- The IP brought the student into the office and sat down together for the debrief.
- On the occasions when their students had the opportunity to self-assess, the younger ones thought they were better than their actual skill level.
- The debriefing process prior to FITS was usually done by just randomly discussing different parts of the lesson and trying to remember certain issues with a flight. It wasn’t uncommon to forget something we were supposed to cover and think of it after the lesson was over and the student had left.

Some interviewees did report always having used a less one sided, more questioning approach in their debriefings. For example:

- The instructor began by asking students how they thought maneuvers went, however, most students already knew how the flight went. (This interviewee noted that he thought this questioning procedure was common sense.)
- Upon returning from the lesson, the instructor would ask the student how s/he thought things went and would then give his own view.

In contrast to the previous debriefing strategy, the interviewees reported a number of changes since having implemented the LCG approach. The first characteristic that interviewees noted was a longer amount of time allotted to the LCG debrief, with most CFIs reporting that the LCG debriefs last around 30 minutes. The additional time was taken up largely by a higher level of detail. Additionally, many interviewees emphasized the highly interactive nature of the conversation. Some challenges regarding the use of the LCG style were also stated. These included:

*Self-Assessment.* The CFIs noted some difficulties with the self-assessment process. Specifically, the CFIs noted that inaccuracies occurred. This included both the pilot-in-training being more critical of him/herself than was the IP and also situations when the pilot-in-training was more lenient than was the instructor.

*Debriefing Protocol.* During the interviews, it was evident that considerable variability existed in implementing the LCG approach. For example, some instructors asked the pilots-in-training to complete the self-assessment without the instructor present, other instructors were available for questions as the student completed the ratings, and still other CFIs completed the ratings together with each student.

*Transition/Adjustment.* Finally, the interviews elicited numerous comments regarding the novelty of the approach, as compared to the traditional debrief, and the necessary adjustment needed by both the students and the instructors. Comments focusing on the student or customer perspective included:

- Customers get better and are more willing to ask questions as training progresses. With customers who are reluctant to self-assess, the IP has to continuously encourage the customer with questions such as, “How do you think it went?” and “What areas are still confusing?”
- Hard to get students engaged; need sufficient time to explain LCG to get students engaged; requires more time to do

the debrief; some students are shocked that they get to grade themselves.

- Most trainees don’t know enough to answer questions, because they are learning new concepts.
- Trainees need some guidance at first, and they gradually become more willing to ask questions as they progress and become more receptive to the process.
- The LCG approach is not difficult to implement with a bright, educated, motivated audience.
- Customers do not always see the value of the LCG approach.

Other responses had to do with the adjustment needed by the instructors:

- It is difficult to get instructors to do it, because it is not the way they were taught; instructors must overcome old habits.
- It can be difficult for instructors to “convert” to “hands-off”, but students will follow the instructor’s lead.
- It is difficult at first, because anything is difficult to adopt when you are used to a different practice. But once people have used it, most feel that it is very effective.
- In many training environments severe time constraints exist and lengthy debriefs are not currently feasible.

### **Recommendations from the Literature**

Generally, the instructor comments were positive regarding the LCG approach. Challenges did occur, however. This section will offer responses to those challenges based on previous related research. The literatures drawn from include metacognition and self-assessment as well as applied research on debriefing methods in the U.S. Navy. Briefly, in efforts to improve performance in team tasks occurring in dynamic and potentially high-stress environments, where stress can have a debilitating effect on decision making, researchers working with the U.S. Navy developed a facilitative debriefing approach (Tannenbaum, Smith-Jentsch, & Behson, 1998). The facilitative debriefing approach (i.e., “team self-correction” and “team dimensional training”) was used primarily for teaching teamwork skills (e.g., communication, supporting behavior, information exchange, and leadership). While these teamwork skills are not all directly applicable to general aviation, it is likely that the facilitative debrief strategy would easily generalize to the training of many other types of skills, such as those

needed in general aviation. While a full review of any of these topics is well beyond the scope of this paper, a sample of the related work is discussed in relation to the challenges that have appeared in the implementation of the LCG debrief.

### **Challenge 1: Self Assessment**

As noted earlier, the CFIs reported that some inaccuracies occurred in the pilots-in-training self-assessments. Considerable literature on self-monitoring exists, and the research shows, unfortunately, that self-assessments are notoriously inaccurate for a number of reasons. Schraw, Dunkle, & Bendixen (1995) summarize that self-monitoring accuracy may be affected by various factors, including task difficulty, age, comprehension instruction, background knowledge, performance level, level of detail of learned information, amount of expertise in the task domain, incentive to self-monitor, and inclusion of prompting questions and feedback as part of the task. Even skilled adult learners can display poor monitoring under certain conditions (Schraw, Dunkle, & Bendixen, 1995). Thus, the instructor comments regarding inaccuracies parallel the research findings, and instructors using LCG should be aware that self-assessments are notoriously inaccurate.

On the positive side, however, research indicates that self-monitoring ability can develop over time and with training (Schraw & Moshman, 1995). Unsurprisingly, Schraw & Moshman (1995) note that self-monitoring is quite poor in children, but by college, most students can self-monitor their own learning experiences. Research indicates that one method to increase self-monitoring skills is via a domain-specific monitoring experience or through training (Nietfeld, Cao, & Osborne, 2005; Schraw, 1997; Schraw & Moshman, 1995).

Importantly, the self-monitoring skill seems to improve performance (Schraw & Moshman, 1995). For instance, Delclos and Harrington found that a group trained in both monitoring and problem solving performed better than groups trained in only problem-solving or not given any training at all (Nietfeld & Schraw, 2002).

*Recommendations: CFIs, be patient. A pilot-in-training may seem to use poor self-monitoring methods, but through practice in self-monitoring and feedback from/discussions with the instructor, it is likely that these skills will improve (Nietfeld, Cao, & Osborne, 2005; Schraw, 1997; Schraw & Moshman, 1995).*

### **Challenge 2: Debriefing protocol**

Another issue that arose in the interviews was that variance in the debriefing protocol is occurring. That is, instructors are using different procedures in carrying-out the LCG debriefs. Borrowing from research in the team performance literature, one strategy to help ensure consistency in application of the LCG debrief is to employ an instructor guide (e.g., Smith-Jentsch, Payne, & Johnston, 1996; Smith-Jentsch, Zeisig, Acton, & McPherson, 1998). Smith-Jentsch and colleagues (1996; 1998) advocated the importance of supporting instructors who are leading self-correction debriefings with a detailed guide that includes the step by step process of the debrief, example probing questions to ask, and other points. Since the LCG debriefing method is considerably different from the methods that CFIs had been using, a guide of this nature could act as a memory aid to help instructors through the debriefing process.

*Recommendation: Develop an instructor guide that includes what to talk about as well as how to ask probing questions similar to those used in the team self-correction debriefs (e.g., Smith-Jentsch, Payne, & Johnston, 1996; Smith-Jentsch, Zeisig, Acton, & McPherson, 1998).*

### **Challenge 3: Transition from the traditional flight debrief to the new debriefing style**

Many interviewee comments about the LCG process were concerned with the need for both the instructor and pilots-in-training to adjust to the new debriefing style. The LCG debriefing strategy requires the instructors to shift from the traditional “one-way” style (during which their role was to provide his/her own feedback to the pilot-in-training) to an environment where the CFI has the role of asking probing questions and leading a discussion which includes, but is not focused on, his/her feedback to the trainee. In turn, the role of the pilot-in-training shifts from a more passive role of listening to the feedback from the instructor, to an active role where the pilot-in-training is expected to respond to probing questions and self-critique regarding his/her performance.

Previous research on team self-correction debriefs advocated that both the instructors (Tannenbaum, Smith-Jentsch, & Behson, 1998) and the trainees (Blickensderfer, Cannon-Bowers, & Salas, 1997) should receive training on the self-correction process. The notion is that to ensure an effective LCG debrief, the instructors will need focused training and practice

on facilitating the new-style of debrief. At the same time, as described in the self-assessment literature, self-monitoring is itself a skill, and the trainees themselves may need some pointers on how to self-monitor and self-critique.

*Recommendation: Provide training including the what, why, and how of LCG debriefs for instructors (e.g., Tannenbaum et al., 1998). Additionally, for the pilots-in-training who are new to the self-monitor and self-critique process, incorporate training on how to self-monitor and self-critique in the flight training process (e.g., Blickensderfer et al., 1997).*

### Summary and Conclusions

Recently, the LCG debriefing strategy has been introduced to general aviation flight training. LCG includes two parts: learner self assessment and a detailed debrief led by the instructor. The purpose of the self assessment is to stimulate growth in the learner's thought processes and, in turn, behaviors. While not in the general aviation domain, multiple studies have indicated positive results from using self-monitoring related debriefing methods (Blickensderfer et al, 1997; Nietfeld & Schraw, 2002, Schraw & Moshman, 1995; Smith-Jentsch et al., 1998).

This current study examined how the LCG process was being implemented in the field. A series of interviews with CFIs indicated that, overall, the CFIs see benefits in using the LCG approach. Challenges that appeared, however, included issues with learner self-assessment, the debrief protocol, and in transitioning to the new approach, in general. Recommendations that address these concerns include to: 1) help pilots-in-training to develop their self-monitoring skills, 2) design an instructor guide (that includes what to talk about as well as how to ask probing questions) that serves as a memory aid for instructors new to the LCG process, and 3) provide instructor training including the what, why, and how of LCG debriefs.

It is hoped that these recommendations will enable refinements and continued use of the LCG debrief in general aviation. Ultimately, it is hoped that the general aviation pilots who were instructed using the LCG method will continue to use the methods of self-monitoring and self-critique to continuously grow and develop as pilots long after their time with an instructor has ended.

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