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Air Carrier Check Airman Training: An Adult Education Model

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Air Carrier Check Airman Training: An Adult Education Model

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The Ohio State University

Presents

The 11th International Symposium on Aviation Psychology

March 5-8
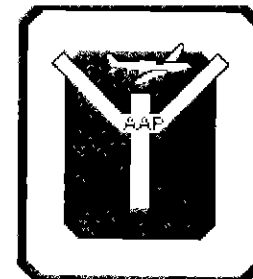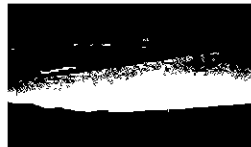
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Wednesday, March 7, 1000-1130 - Union C

Threat Error Management: Helmreich Session
Dr. Robert Helmreich, University of Texas

Overview of the Threat and Error Management Model and Application to a System Accident. Robert Helmreich, University of Texas

Assessing Threat and Error with the Aviation Safety Action Program. John Wilhelm The University of Texas at Austin and Bruce Tesmer

The Link Between Safety Attitudes and Observed Performance on the Line. J. Bryan Sexton. James R. Klinect, Robert L. Helmreich, Tor Neilands and John A. Wilhelm, University of Texas

Micro-coding Cockpit Communication Content: Linking What Was Said to Performance. J. Bryan Sexton, Robert L. Helmreich, and John A. Wilhelm, University of Texas

A New Training Program in Threat and Error Management. Donald Gunther Continental Airlines

Wednesday, March 7, 1000-1130 - Union D

Advanced Training
Dr. Hans Juergen Hoermann, DLR, Germany

Effects of Video Game Experience on Agate Systems Training Testbed Performance Sangkyun Kim, John Wise, Fran Greene, and Steve Hampton, Embry-Riddle Aeronautical University

Constructing a conceptual framework for 'glass cockpit' training. R. Mumaw, Boein Commercial Airplane Group, D. Boorman, & J. Griffin

Airline Instructor Training: An Adult Education Model. Roger Mason, TWA, John Henschke, Tom Weitzel

Practical Strategies for Aviation Educators: Reflective Practice and Student-Centred Debriefing. Irene Henley, University of Western Sydney, Mary Ann Turney, Dorothy Schick

Management of Flight Operating Document Systems. Barbara G. Kanki, NASA Ames Research Center, H. Coan, & T. L. Seamster

Wednesday, March 7, 1000-1130 - Union E

Air Rage
Dr. Jerry Chubb, The Ohio State University

An Investigation Of Airline Cabin Safety: A Taxonomy Of Disruptive Passenger Behaviour. Sylvia Loh, Ansett Australia

Survey of the world's airlines about managing disruptive passengers. Robert Bor, London Guildhall University, Morris Russell, & Justin Parker

Air Rage - a Human Factors Issue. Angela Dahlberg, Dahlberg Associates

Wednesday, March 7, 1000-1130 - Delaware D

Safety Culture I
Dr. Scott Shappell, FAA CAMI

The Canadian Military Flight Safety Culture Breaks New Ground. Georgette Buch, Directorate of Flight Safety, National Defence Headquarters, Canada

Safety Culture Assessment In Military Aviation. Keith G Stewart and Amir N Zar, Centre for Human Sciences, Defence Evaluation and Research Agency, UK

Complimenting the Traditional Hierarchy of Aviation Safety Controls with a Behavior-Based Safety System: Preliminary Findings from the College of Aviation at Western Michigan University, William Rantz, Ryan Olson, and Alyce Dickinson, Western Michigan University.

Russian and American Aviation Safety and Human Factors a Cultural Comparison. Ellen N. Overton, Embry-Riddle Aeronautical University and Sergei Miloslavine

Wednesday, March 7, 1300-1500 Union A

Autopilot Awareness
Dr. Kathy Mosier, University of San Francisco

A Method for Reverse-Engineering Autopilot Behavior: Application to the A340-200/300. Denis Javaux, University of Liege, Belgium

What's it Doing Now?: Taking the Covers off Autopilot Behavior. Lance Sherry, Honeywell, Michael Feary, Peter Polson, Everett Palmer

The Effects That Automation Had on Human Performance. Fred Rudolph, NASA Ames Research Center

AIR CARRIER CHECK AIRMAN TRAINING: AN ADULT EDUCATION MODEL

Roger A. Mason and John A. Henschke
University of Missouri-St. Louis

Thomas R. Weitzel
TWA and Embry-Riddle Aeronautical University
Daytona Beach, Florida

ABSTRACT

Air carrier check airman selection and training is generally based on technical expertise. Teaching and learning styles are not currently part of the curriculum in these training programs and thus may contribute to the significant dropouts and training problems. A model consisting of five building blocks that make up a systematic training program is introduced that may aid the non-experienced teacher of adults. Many air carrier check airmen have several years teaching experience, however for the purpose of this paper non-experienced will refer to those individuals who have not received formal training in teaching and learning styles of adults. A field survey of line instructor pilots was conducted in 1999 at a major air carrier and the results of the survey support the model presented.

INTRODUCTION

The selection and training processes of air carrier check airmen has focused primarily on technical expertise. An emphasis on the teaching and learning styles of adult learners has been for the most part neglected. Henschke (1987a) proposed that while results of the traditional selection process have not been entirely the fault of the teacher, flawed selection has resulted in significant dropouts in a wide variety of programs. This paper suggests that improper selection and training of check airmen has contributed to training problems and failures, and presents a model to assist the non-experienced teacher of adults. While it is recognized that many check airmen may have taught for several years, for the purposes of this paper non-experienced will refer to those individuals that do not have formal training in the educational process.

THE LITERATURE

There is a distinct difference between the styles by which children and adults learn (Knowles, 1980). Unfortunately, many air carrier training programs utilize only pedagogical techniques--the art and science of teaching children--when working with adult learners. Knowles (1980) originally defined andragogy as the art and science of helping adults learn, but later modified this and described andragogy to be a model of assumptions to be used along side the pedagogical model (Knowles, 1996). In this way, a teacher may use the pedagogical and andragogical models as the ends of a spectrum to determine a fit for a particular learning situation. Karp (2000) has acknowledged that while adult learning is largely self-directed, lecture will be effective when learners have little knowledge of the subject. This is an example of when the pedagogical model would be appropriate. Knowles (1980) presented assumptions regarding the differences between the models of learning (Table 1). These assumptions should be clearly understood by check airman in order to assess where the learner is relative to the spectrum in order to achieve satisfactory training outcomes.

Zemke and Zemke (1981) pointed out various adult learning characteristics that would benefit the non-experienced teacher of adults. They found that adult learners need to be able to integrate new ideas with past experience and that adults tend to take mistakes personally which in turn affects their self-esteem. The impact of the instructor has been discussed by Gregorich and Wilhelm (1993) who maintained that some variation in instructional practices may benefit training sessions due to different teaching styles. The authors' thesis is that air carrier check airman programs do not provide this information to prospective instructors. An environment where students feel supported and where teachers treat students as peers was among the characteristics of effective adult education programs presented by Billington (1988).

A FIELD STUDY

The selection and training process of a specific major air carrier was analyzed and it was noted that the check air training program does not incorporate the aforementioned adult learning characteristics as opposed to that which has been posited by the authors. At this airline, prospective check airmen make it known to a flight manager their interest in instructing. A brief resume is requested and the prospect's name is submitted for "name approval" to the flight managers of the carrier and to all current instructors. After clearing name approval, the prospect is given a

TABLE 1
Assumptions of the Pedagogical and Andragogical Models of Learning
(from Knowles)

About	Pedagogical	Andragogical
Role of learner's experience	To be built on more than used as a resource	A rich resource for learning by self and others
Readiness to learn	Uniform by age-level and curriculum	Develops from life tasks and problems
Orientation to learning	Subject-centered	Task or problem-centered
Motivation	By external rewards and punishments	By internal incentives, curiosity

standards checkride by a Principal Check Airman in order to evaluate compliance with company policies and procedures and to determine if the prospect can accept some minor criticism. Upon successful completion of the standards checkride the prospective instructor will be sent to a Check Airman class. This is a 5-day school in which curriculum stresses grading standardization and compliance with company policy. Only one one-hour session is devoted to teaching and learning styles and is taught by a check airman lacking a background in education. The primary subject during this session is Crew Resource Management or how to manage the cockpit. One full day is devoted to line instructor training with an emphasis again placed on grading and compliance. During this day-long session, experienced instructors relate various incidents they have encountered over the years and convey a variety of techniques and tips that they found useful. These techniques generally deal with recognizing unusual flight situations such as hard landings and unusual attitudes but do not address teaching or learning styles. This discussion points out that the training program does not incorporate adult learning techniques, given that classroom lecture comprises most of the program.

Selections from an actual case of the air carrier in the field study are presented in order to illustrate the need for understanding adult learning characteristics. In this particular instance, the student was an upgrade captain experiencing command ability problems. In a comment sheet passed from instructor to instructor early in the training cycle, it was noted that the student captain displayed a lack of enthusiasm and appeared to study very little. To the instructor, he appeared "laid-back" and showed a lack of drive. He was encouraged by the instructor to get more involved. In a note passed two weeks later, another instructor commented that the student seemed to be "along for the ride" and was again encouraged to become more pro-active in the operation. Finally, an instructor with an advanced degree in education and an understanding of adult learning styles engaged the student in a discussion as to his progress thereby involving the learner. Later, a Federal Aviation Administration (FAA) inspector observed the student on a flight and noted no deficiencies in command ability or technical expertise.

In summarizing this case analysis, very little emphasis is given to characteristics of adult learners or teaching and learning styles in the check airman training program. Henschke (1987b) noted that the literature in adult education suggests that technical expertise is the primary qualification for trainers and formal preparation for teaching the adult learner is lacking. Thus, a model is introduced that may aid the non-experienced teacher (check airman) of adults.

THE HENSCHKE MODEL

This model is based upon five building blocks which comprise a systematic training program for the non-experienced teacher of adults:
1. Beliefs and notions about adult learners.
2. Perceptions concerning qualities of effective teachers.
3. Phases and sequences of the learning process.
4. Teaching tips and learning techniques.
5. Implementing the prepared plan.

TABLE 2
Characteristics of Motivating Instructors

Expertise: The power of knowledge and preparation	Empathy: The power of understanding and consideration	Enthusiasm: The power of commitment and animation	Clarity: The power of language and organization
Knows something beneficial to adults	Has a realistic understanding of learner's needs and expectations	Cares about and values what is being taught	Can be understood and followed by most learners
Knows it well	Has adapted instruction to the learner's level of experience and skill	Expresses commitment with appropriate degrees of emotion, animation, and energy	Provide for learners a way to comprehend what has been taught if it is not clear in the initial presentation
Is prepared to convey it through an instructional process	Continuously considers learners' perspectives		

Beliefs and Notions About Adult Learners

As was discussed earlier, major differences exist between adult and children learning styles and the check airman must be aware of adult learning characteristics. Henschke (1987a) stated that adult learners have a concept of self, such that in a learning situation the adult: (a) accepts responsibility, (b) orients toward the future, (c) values initiative, (d) solves problems, (e) opens to opportunities, (f) is creative, (g) possesses ideology, and (h) is within a context.

A characteristic of the adult learner that the check airman should understand is that adults bring a great deal of experience to each learning situation (Zemke and Zemke, 1981); new knowledge or skills should be integrated with this previous experience. A field study (Tardino, Mason, & Tillett, 1999) conducted at the major carrier mentioned earlier evaluated its instructor training program and supported this adult learning premise. Among the respondents, 38% made comments to the effect that previous experience had the largest impact on their ability to instruct effectively, while only 22% credited aspects of the training directly.

Perceptions Concerning Qualities of Effective Teachers

Cochran (1981) proposed five qualities of an effective teacher:
1. Interested in the students and the subject being taught.
2. Ability to communicate well.
3. Good knowledge of the subject (good flying skills)
4. Prepared to teach the lesson.
5. Is enthusiastic.

Wlodkowski (1985) suggested some of these same qualities in a model of characteristics of good motivators of adults. Four categories were identified and labeled as: (a) expertise, (b) empathy, (c) enthusiasm, and (d) clarity (see Table 2 above). Wlodkowski stated that instructors who develop these skills would generally be good motivators of adults.

Twelve detailed goals that an adult educator should fulfill as a practitioner of andragogy were set forth by Mezirow (1981). Some of the goals are: (a) assist the learner in defining learning needs and learning objectives, (b) help the learner organize material congruent with level of experience, (c) provide a supportive climate and develop learner self-concept, and (d) emphasize instructional methods that focus on participative and experiential techniques.

Collectively it may be seen that a good teacher of adults will have characteristics that include: (a) good communication skills, (b) the ability to express enthusiasm, (c) preparation and organizational skills, (d) the ability to involve the learner, (e) supportiveness, and (f) technical expertise. It would be beneficial to check airman training programs to identify these characteristics in prospective instructors during the selection process.

Phases and Sequences of the Learning Process

This is the area where the typical check airman training program falls short. In general, no emphasis is placed on the learning process. Knowles, Holton, and Swanson (1998) defined four phases of the adult learning process:

1. Need--determine what learning is needed so as to achieve goals.
2. Create--create a strategy and obtain resources to achieve the learning goal(s).
3. Implement--implement the learning strategy and utilize the learning resources.
4. Evaluate--assess the attainment of the learning goal and the process of reaching it.

The previously mentioned field study (Tardino et al., 1999) found that 71% of respondents felt that the instructor training program failed to prepare them for the instructing challenges they met flying the line. Clearly, the adult learning process could and should be part of the check airman training curriculum.

Teaching Tips and Learning Techniques

To ensure a meaningful learning experience for the adult student, it would benefit a check airman training program to incorporate teaching techniques and tips such as use of groups, simulation, role-play, audio/visual aids, and demonstrations (Henschke, 1987b). Karp (2000) proposed utilizing cooperative and collaborative learning techniques and computer-based training as alternative techniques when working with adults. These learning aids could aid the non-experienced teacher (check airman) of adults particularly when faced with novel instructional situations. The field study participants generally felt that the check air ground school did not adequately cover instructional techniques that are useful in line training operations. Only 42% of check airmen surveyed thought the check air ground school prepared them for their first student, but 60% rated the class high in emphasis on policies and standards (Tardino et al., 1999). This would indicate a need to incorporate a session on teaching techniques and tips in an instructor program.

Implementing the Prepared Plan

According to Henschke (1987a) this step can not be taught. It is a matter of attitude and intuition in determining what must be done in specific learning situations. The teacher, in order to implement the plan must display an attitude: (a) of being open to ideas that differ from those in the design, (b) of caring and being capable of showing it, (c) of treating adults as individuals and recognizing that each is unique, (d) of supportiveness towards learners, and (e) of considering the learning process as important.

DISCUSSION

Brookfield (1985) has proposed the following six principles of practice that are crucial to adult education: (a) that participation is voluntary, (b) there is a respect for self-worth, (c) that adult education is a collaborative effort, (d) that praxis is at the heart of adult education, (e) that adult education fosters a spirit of critical reflection, and (f) the goal of adult education is the nurturing of self-directed, empowered adults.

Brookfield's principles parallel Knowles and Henschke in that adult learners are self-directed, that teachers display an attitude of supportiveness, and a collaborative effort exists between teacher and learner. Therefore, implementation of the prepared plan is a matter of praxis, the practical application of the model. Implementation encompasses intelligence, reasoning and the art of teaching adults. In the field study (Tardino et al., 1999) conducted of line instructor pilots, 42% felt that recurrent training of instructors was essential to a quality instructor training program. Most felt the need to review techniques and tips was important as well as identifying trends that the group noted during line operations. In addition, it was noted that recurrent training provided a vehicle for information exchange between instructors and would improve standardization. Recurrent training is an annual requirement of the FAA and presents an excellent forum in which to incorporate the practical applications (praxis) of the model.

CONCLUSIONS AND RECOMMENDATIONS

The foregoing discussion has introduced a model that may aid the check airman with little or no formal exposure to teaching techniques and learning styles of adults. A field survey was conducted at a major air carrier and the results support Henschke's (1987a) assertion that the traditional selection and training process of trainers of adults may lead to dropouts and

training problems. The study also showed that line instructors did not think the check air ground school adequately prepared them to teach and as such they had to rely on past experience to cope with the learning situation.

It is clear that air carrier check airman training programs do not provide the instructor with adequate information on how to teach or how adults learn. The emphasis on most of these programs deals with grading and standards. Admittedly these are very important elements in a training program, however in order to provide a more meaningful experience for both the instructor and the student, a five-step model has been proposed that will aid the non-experienced teacher of adults. The selection process should screen prospective candidates for characteristics of good motivators of adults that have been presented in order to procure the best possible teacher. While this paper has focused primarily on line instructor pilots, the model would certainly have applications in ground training and simulator training. Further research is recommended in order to gauge the effectiveness of the model, but the authors believe that incorporation of the model in air carrier check airman programs will produce beneficial training results.

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