สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Guidance Material for Virtual Classroom Training

CAAT-GM-OPS-VCT

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Approved by

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Abbreviations

Abbreviations	Meaning
AOCR	Air Operator Certificate Requirements
ATCO	Air Traffic Controller
CAAT	The Civil Aviation Authority of Thailand
EASA	European union Aviation Safety Agency
GAR	General Aviation Requirements
GM	Guidance Material
HOR	Helicopter Operations Requirements
ICAO	International Civil Aviation Organization
LMS	Learning Management Systems
VLE	Virtual Learning Environment

0. Introduction

0.1 Background

Guidance Material for Virtual Classroom and Distance Learning is issued by the Director General of the Civil Aviation Authority of Thailand from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. GM contain information about standards, practices and procedures acceptable to CAAT. A GM may use in accordance with AOCR Chapter 6, Appendix D, Appendix E, Appendix G, GAR Part II Chapter 5 and HOR Appendix C.

0.2 Purpose

The purpose of this publication is to provide to all concerned in the consideration of organizing the virtual classroom training, and to ensure that the air operators or the training providers can deliver the required theoretical part of training safely, regularly, and in accordance with the requirements included in AOCR.

0.3 Applicability (is subjected to)

This GM is applicable for the Thai's Operator conducting operations under Thai AOCR.

0.4 Reference (Refer regulation)

0.4.1 EASA – Guidance for allowing virtual classroom instruction and distance learning, Issue no. 5, Date 18 AUG 2020

0.4.2 ICAO – Circular 356, Guidelines on Digital Learning for Cabin Crew Training

0.5 Definitions

Term	Definition
Training provider	Training organizations providing training for student pilots, pilots, students Air Traffic Controller, Air Traffic Controllers, Cabin Crew, maintenance personnel, authority personnel
Student	Civil aviation personnel under training: student pilot, pilot, student Air Traffic Controller (ATCO), ATCO, student maintenance personnel, maintenance personnel, cabin crew, authority personnel
Instructor-centered	When the instructor is responsible for teaching the student
Student-centered	Means that the student is responsible for the learning progress
Blended training	Includes different instructional methods and tools, different delivery methods, different scheduling (synchronous/asynchronous) or different levels of guidance. Blended training allows the integration of a range of learning opportunities
Classroom	A physical, appropriate location where learning takes place
Remote learning	When the student and instructor, or source of information, are separated by time or distance and cannot meet in a traditional classroom setting. Information is typically transmitted via technology (email, discussion boards, video conference, audio bridge or data carrier such as USB, DVD, etc.) so that no physical presence in the classroom is required. It can be synchronous or asynchronous.
Virtual classroom	A virtual environment, not physical, location where synchronous learning takes place
Computer-based training (CBT)	Any interactive means of structured training using a computer to deliver a content. It needs to be complemented with close assistance by an instructor
Distance learning asynchronous	Training situations in which instructors and students are physically separated. The teacher and the students do not interact at the same time. In pilot training it is applicable only in modular courses
Distance learning synchronous	Training situations in which instructors and students are physically separated. It is synchronous if the teacher and the students interact at the same time (real time).
E-learning	Training via a network or electronic means, with or without the support of instructors (e-tutors)
Mobile learning (M-learning)	Any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies
Web-based training (WBT)	Generic term for training or instruction delivered over the internet or an intranet using a web browser

1. General

The training in aviation industry is currently experiencing a major shift to more on-line learning and instruction, such as the virtual classroom training. This is constantly evolving and deals with new challenges, diverse cultures, different generations of trainees and new regulations.

However, on-line teaching requires careful thinking about how students and teachers are equipped for the change and serious consideration about whether the teaching style is still effective when taken out from the classroom and transposed to or mixed with technological devices. Moreover, inequalities are worsened when it comes to access to technology and digital devices, as many students may lack the connections and devices to learn remotely.

By using the concept of technology-enhanced learning, the virtual classrooms are online environments that allow teachers and students to interact during a virtual class using audio, video, text, screen sharing, instant polling among other features.

This document provides guidelines for conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom training. It also provides the guidance on designing, developing and using digital learning for training.

In order to maintain high-quality standards of training, hands-on practical training should be conducted as per the applicable training program. A reasonable balance between the different training methods should always be ensured so that the student achieves the level of proficiency necessary for a safe performance of all related duties and responsibilities.

Even if this guidance material provides guidance for the virtual classroom training, it does not mean that it is not required for the air operators or the training providers to consider the practical training where appropriate and feasible. The virtual classroom training is not meant to replace classroom training, hands-on exercises or traditional simulated exercises in their entirely. Some trainings are still required the teaching through a combination of theory and practice.

Finally, the virtual classroom training should fit the organization’s purpose. The content and the learning outcomes should be continually evaluated and modified, as necessary, in order to improve the effectiveness and retention of knowledge and skills. It is not meant to reduce costs.

2. Virtual Classroom Training

Different ways of learning and communicating are necessary to successfully enable the continuation of the required training. Additionally, remote learning will become very important. Substitute face-to-face classroom instruction by virtual classroom training require careful consideration. The virtual classroom training is an online learning environment where the participants can interact through discussion and access multiple sources of media.

When deciding to allow the virtual classroom training, the air operators or the training providers should perform a risk assessment that, as a minimum, carefully evaluates whether:

(1) Students and theoretical knowledge instructors will have access to appropriate equipment to support remote learning/instruction or the shift from face-to-face to virtual classroom training;
(2) The teaching style remains effective in achieving the training objectives;
(3) The remote environment is able to reach each training objective.

Most traditional training delivery system can have virtual equivalents, such as:

(1) A classroom can be physical or virtual;
(2) Tutorials can also be e-tutorials;
(3) Computer Based Training can be also be available online outside of the air operators or the training provider's material;
(4) Demonstrations, including those supported by demonstration equipment where virtual reality technology can be applied;
(5) Exercises carried out as groups or individuals and based on pre-flight and en-route planning, communications, presentations, and projects may be online in a small virtual classroom;
(6) The directed study including workbook exercises or assignments, is excellent for online Learning Management System use;
(7) In aviation industry field trips, aerodrome or aircraft visits, the instructor can present from industry field, whilst students can have an online session (e.g. using Open Broadcaster Software) with the possibility of asking questions;
(8) E-learning;
(9) Mobile learning (M-learning);
(10) Web-based learning.

The air operators or the training providers should reflect the agreed approach with a (temporary) update of the training manual. To shift from the face-to-face class to the virtual class is a transformation/variation that must be managed according to the change management procedure described in the manuals of a training provider itself.

2.1 Virtual Classroom Training Instruction

The virtual classroom training should generally be considered an accepted alternative to face-to-face classroom training in the context of classroom training as required for both modular and integrated courses.

The face-to-face classroom instruction delivered by an instructor may be replaced by virtual classroom training, such as videoconferencing, if an acceptable level of communication and interaction is ensured with appropriate equipment and tools. The virtual classroom training should provide real-time instructor-led learning where students can interact, communicate, view and discuss presentations. The air operators or the training provider should also guarantee that students make satisfactory academic progress and maintain reliable records for the completion of training.

There are no requirements for IT infrastructure addressing personal data protection and security, change management, continuity, integrity, audits, user authentication privileges, logging of overall integrated system activity, etc. However, many air operators and training providers run their business in the paperless way with various types of IT tools, forming a more or less integrated IT system: VLE (Virtual Learning Environment), LMS (Learning Management Systems), Virtual Classrooms, Video Conferencing, cloud-based e-learning, progress tests from outsourced sites, E-books, Twitter, YouTube or other video channels, etc.

2.1.1 Instructional Design Process

The process of instructional design should focus on factors that influence learning outcomes, including, but not limited to:

(a) the level of knowledge regarding content and the technology utilized that individual trainees need for accomplishing the objectives;
(b) the appropriateness of instructional strategies in terms of objectives and trainee characteristics;
(c) definition and implementation of the support needed for successful learning; and
(d) periodic revisions or any change to operational documents that are necessary to ensure the programme meets expected outcomes.

In determining the instructional design, the following characteristics should be considered:

(a) hardware and software (i.e. the training platform);

(b) audience (e.g. skills, knowledge level, etc.);

(c) trainee and instructor objectives

(d) training content and structure

(e) assessment criteria; and

(f) evaluation process (of content and results).

2.1.2 Level of Communication

In order to equally interact between the students and the instructor, active participation, collaborative work, and communication are encouraged in this type of classroom. The instructor creates opportunities for both independent learning and learning from one another, and guides the students in developing and practicing the skills they need. This will increase the motivation level of the students as well as their interest in the learning activities.

An acceptable level of communication should meet all the following criteria:

(a) Live interactive instructor-led sessions in an online learning environment within a shared online space;
(b) Maintain continuously an active and simultaneously exchange between instructor and student(s): dynamic and two-way flow of communication without delay;
(c) Able to share relevant training material as specified for the appropriate lesson, unit or course in the training manual;
(d) Maintain a "video and audio" interactive communication by considering non-verbal communication cues (tone of voice, facial expression);
(e) Establish a policy for the use of the virtual classroom instructions such as "raise your hand, question, …"
(f) Monitor what the instructor's screen displays;
(g) Ensure that students have tools to present learning content in different formats, as well as to implement collaborative and individual activities. The instructor should have the particularly important role of the moderator who guides the learning process and supports group activities and discussions.

2.1.3 Appropriate Equipment and Tools

The equipment/tools needed for the virtual classroom training should ensure an acceptable level of communication without technical interruption during the virtual classroom instruction. The equipment should ensure the students identification (visual when needed) and, a continuous assessment of the level of communication with all students. The equipment should permit the instructor to achieve the same training objectives and quality of instruction compared to instruction within face-to-face classroom instruction as defined by the training provider.

Note: Smart phones are not considered adequate for presenting video and images.

2.1.4 Instructor

Over the course of the virtual classroom training, the students should be encouraged by the instructor to participate at regular intervals. This can be achieved by a variety of activities such as brainstorming, small group discussion, collaborative and individual tasks, Q&A sessions, etc.

The air operators or the training provider should ensure that the instructor who delivering virtual classroom training:

(a) Has received appropriate training covering at least learning style, teaching method associated to virtual classroom instruction, such as videoconferencing, and a familiarization to the used virtual classroom instruction system,

(b) Demonstrates his ability to manage time, training media and equipment and tool to ensure that the training objectives are met,

(c) Performs any necessary assessment of the student(s) including proper identification of the assessed student.

2.1.5 Student

During the virtual classroom training, there should be opportunities for frequent interaction between student and instructor, student and other students, and student and content: instruction in a synchronous virtual classroom can only be successful with the active participation and engagement of the students.

Creating positive learning environment, engaging students and encouraging active participation helps students achieving the learning objective.

2.2 Acceptable Level of Academic Effectiveness

2.2.1 Maximum number of students and training times

The maximum number of students should be established considering the capability of the tool to maintain an acceptable level of communication and it should be adapted to the training objectives. Training design should consider that students may find virtual classroom training more tiring than traditional classroom training and the daily training hours may therefore need to be reduced. A break of reasonable time should be planned for every hour of virtual classroom training.

Note: Ideally, it should avoid exceeding a maximum number of 12 students. In case of number of students is more than 12, the acceptable of communication shall be maintained.

2.2.2 Attendance records

The instructor delivering the virtual classroom training should be responsible for the attendance records of the students by ensuring the students are in the virtual classroom training with the appropriate level of communication during all the virtual classroom training.

The attendance records should include, but is not limited, to:

(a) trainee's information;
(b) course duration;
(c) result of the course (pass or fail if there is a mandatory assessment);
(d) Proof of completion; and
(e) trainee course feedback.

2.2.3 Interruption of connection, loss of communication

Interruption of connection and loss of communication amongst individual participants can happen during a virtual classroom session. The air operators or the training provider should develop a policy on the progress of such a session, repetition of instructed training element and re-involvement of participants affected by the temporary loss of connection. Non-attendance should be managed in accordance with the "non-attendance" policy as in a face-to-face classroom instruction.

2.2.4 Examinations/Evaluations

When examination or evaluation is necessary in the virtual classroom training, positive identification of students should be assured. Oral exams or remote forms could be used, provided the system used is the same for all students.

3. Training System Feedback Loop

The air operators or the training provider should ensure that:

(1) The participants report strengths and weaknesses of the training system (training environment, training programme, assessment/evaluation) and suggest improvements;
(2) The instructor keeps an effective time management;
(3) Discussions among classmates is facilitated;
(4) Feedback system for student is obtained.

4. Approval and Oversight by CAAT

CAAT's approval process may include, but is not limited, to:

(1) review of a risk assessment conducted by the air operators or the training providers;
(2) a mitigation plan in case of system failures;
(3) change management, including procedural updates;
(4) training programme overview;
(5) surveillance/monitoring activities; and
(6) quality management process.

CAAT should be provided access to the virtual classrooms and sample the training. The intensified oversight will be carried out in the initial phase.