International Civil Aviation English Association

ICAEA Workshop 2019, Exploring the Aviation English Training Needs Of: Ab-Initio Pilots and Air Traffic Controllers, and Aircraft Maintenance Personnel

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Workshop A: How Simulation Enhances Communication as an Integration Tool in Ab-initio Air Traffic Controllers' Training

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How Simulation Enhances Communication in ab-initio air traffic controller training

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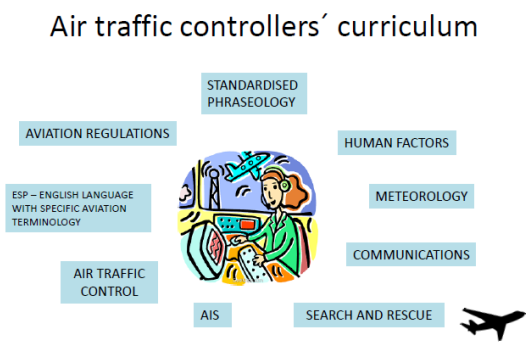
Training air traffic controllers is not an easy task. To be trained as an air traffic controller, is much more difficult. I have been involved in air traffic controllers´ initial training since 1998, and as an On- the-Job-Training Instructor, had the chance to assess different teaching techniques in order to help students achieve their goal: their license.

Simulation proved to be the most powerful tool to help air traffic controllers to be professional, and to understand, not only how air traffic control works in real life, but also to be aware of the impact of the communication skills needed.



When a brand new controller is trained, he/she has to learn everything related to aviation, most of the things they see are new, different and hard to understand. Luckily, technology has become extremely helpful and allows us to watch different 3D videos or listening to real time radio frequency transmissions . Subjects like meteorology, altimetry, air traffic control separations or navigational aids, seem too different to be placed together.

It is through simulation that all this conceptual knowledge is integrated and meaningful learning occurs. Simulation is the technique through which students can experience and develop situational awareness.

Since 1998, at CIPE[1], we work with air traffic control scenarios, simulating non-routine situations to help students to get a complete view of routine and non-routine situations, integrating the subjects learnt. Simulation helps students to connect acquired knowledge in different subjects.

There are different ways of simulating scenarios; when the class is big, a circle disposition like in the picture could be useful. In such round classroom layout, everyone will be able to participate, and after the problematic situation is exposed by the "pilot" (a student designated by the

CIPE – 1998 Standardised phraseology seminar

[1]CIPE (Centro de Instrucción, Perfeccionamiento y Experimentación) ANAC (National Civil Aviation Administration) Buenos Aires, Argentina.

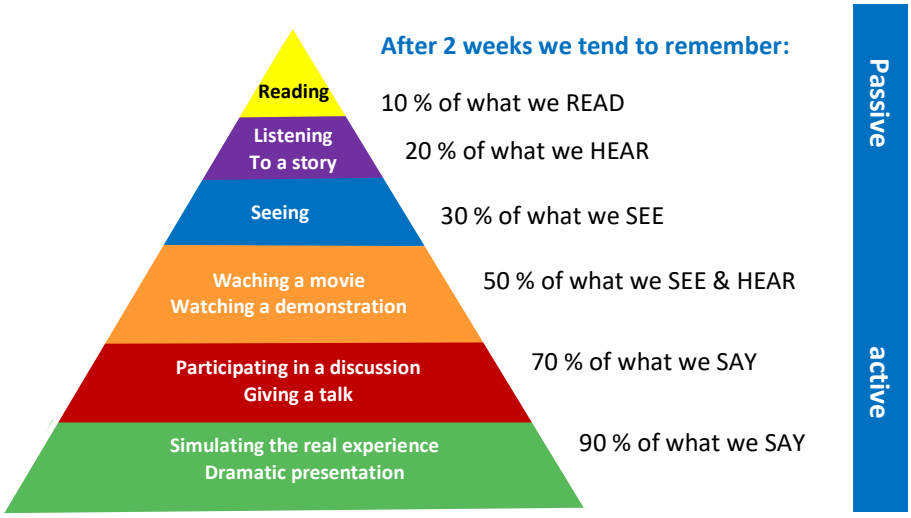
teacher), they, in turns, will participate until the situation is worked out.

Model used in CIPE C. Rivadavia for training Brand new ATCOs

Another possibility is setting a simulation scenario. This implies a space that emulates an aerodrome or an area control centre working position. This might include a model with a runway and planes on a platform or flying (for the tower), flight strips and aeronautical charts (for en-route controllers).

This type of exercise stimulates students positively. They are fully engaged in their learning. This kind of instructional approach helps the brain to organize information and relate it to topics studied, and allows them to carry out hands-on tasks, helping them to realize where each piece of the puzzle is assembled.

Teaching young adults, as ATC students usually are, could be challenging. For students, it is also highly demanding to imagine real traffic situations, when they have never stepped into a control tower or an ACC before. We have found simulating real life situations to be one of the most effective instructional techniques. Following Edgard Dale's theories in his Cone of Learning, we tend to remember 90 % of what we SAY and DO, and when simulating real experiences, they DO separate aircraft and COMMUNICATE in English.



How to plan a simulation

A simulation will be more effective if planning involves all the disciplines taught in the syllabus. It could be designed as the final integration exercise of the course or as a subject in itself.

Step 1: Clearly define your objective

Once the air traffic service unit where the simulation will take place is set, define the learning objective in terms of norms, expected performance and given context.

Step 2: Focus on the norms

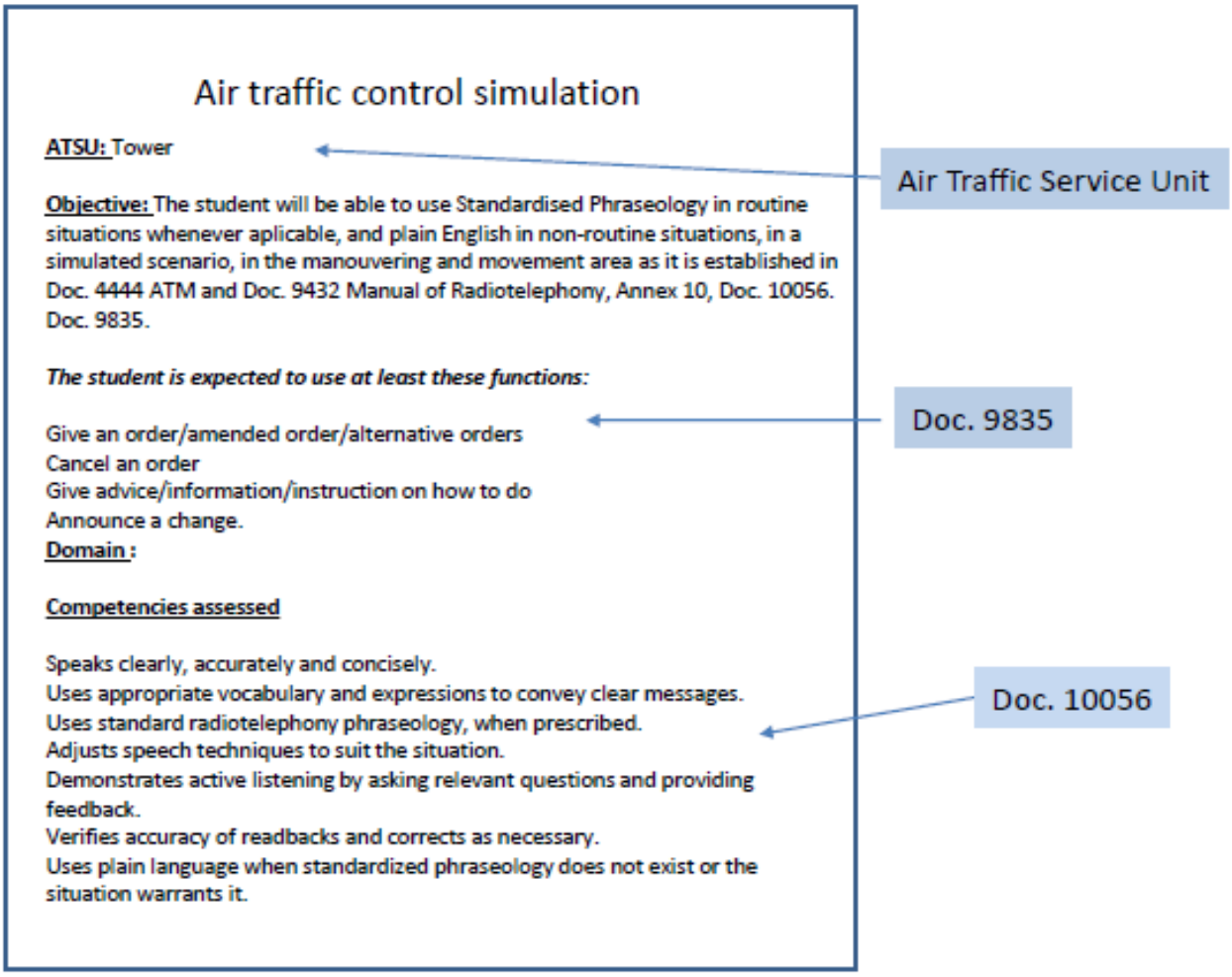
In order to frame the learning objective, and the simulation itself, look for the documents and/or regulations that rule the expected performance.

Step 3: Focus on functions

After defining the learning objective, decide which language functions[2] the student is expected to use.

Step 4: Focus on competencies

Define which competencies will be assessed during the simulation. For this, Document 10056 will be used.



[2] *Communicative Language Functions, Events, Domains, and Tasks associated with Aviation*. (2010) Document 9835: Appendix B- Language of Aeronautical Radiotelephony Communications

Meteorological Information:

Metar 130/10 6000 HZ 15/13 Q1001

Aircraft involved:

Callsign	Dep. ad.	Dest.	First comm.	Altitude
CXMAS	SUMU	Your airport	5 NM SE	2000
PTMET	Your airport	SAAR	Gate N° 6	FL100
ARG1758	Your airport	SARI	Gate N° 3	FL350

At the beggining of the exercise PTMET calls tower and request departure clearance to SAAR. The Student is expected to give Air traffic control clearance, pilot readbacks with one mistake. The student should correct readback.

Later, ARG1758 calls. Request ATC to SARI. Both aircraft call ready to taxi, The student is expected to provide taxi clearances and information about the traffic manouvering in the platform.

CXMAS Calls 5 miles southeast of the airport for landing. Meteorological information should be provided, and landing instructions, including traffic circuit vocabulary and departing traffic information.
Simulation goes on until both aircraft have departed and CXMAS has landed.

Step 5: Prepare the set of materials

Following with the planning of the exercise, detailed information needed for the simulation should be set, as meteorological information, METARs and TAFs, runway in use, information about the traffic involved: callsign, departure aerodrome and destination, reporting positions, altitude and any other information needed to make the situation more real.

After that, a short description of the exercise could be written in order to guide the instructor leading the exercise. A map can also be included, showing the positions of the aircraft at the beginning of the exercise, scripts with examples of the dialogues that should be role-played by pilots, and any other material considered relevant for the development of the simulation.

Additional information: Runway 11/29

METAR 140/10 6000 BR BKN025 15/13 Q1001

Step 6: Implement the simulation

After setting the scenario, and with all the materials required ready, distribute roles as convenient depending on your classroom context. The ideal situation would be two air traffic controllers every five pilots during the first stages of instruction. Playing the role of pilots will help them practice standardised phraseology and gain confidence.

In order to make the excercise more cognitive demanding, the number of flights could be increased as well as the level of difficulty of the non routine situations (according to Doc. 10056).

Step 7: Assess students' performance

Last, but not least, the assessment form. There is not a universal one, a good approach would be to prepare an assessment form including the observable behaviours corresponding to each competence; some competencies could take more than one observable behaviour. Document 10056 could be very useful at this stage.

Here there is an example of an assessment form:

Date: ...../...../.....
Name: ..... Surname: .....
Sector: TWR / APP / AREA (EN ROUTE) / AREA (TMA) Stage : 1 / 2 / 3

	Observable behaviour	S	NS
PC4.1	Selects communication mode that takes into account the requirements of the situation, including speed, accuracy and level of detail of the comm.		
PC4.2	Speaks clearly, accurately and concisely		
PC4.3	Uses appropriate vocabulary and expressions to convey clear messages.		
PC4.4	Uses standard radiotelephony phraseology, when prescribed.		
PC4.5	Adjusts speech techniques to suit the situation.		
PC4.6	Demonstrates active listening by asking relevant questions and providing feedback.		
PC4.7	Verifies accuracy of readbacks and corrects as necessary.		

PC means performance criteria

Conclusions

- Simulation is a powerful tool that allows students to experience and solve ”hands-on-tasks”.
- Meaningul learning may take longer than rote memorization, but the knowledge acquired is more permanent and may be transferred to future professional situations.
- Simulation and OJT helps ab initio air traffic controllers to understand where each piece of the puzzle assembles.
- Simulation makes collecting students’ performance evidence easier than other techniques.
- According to Edgar Dale´s pyramid, doing things is one of the best ways to achieve long term knowledge (learn by doing).
- Assessment criteria becomes clearer for students’ management of their own learning
- Assessment techniques foster more effective competence-based learning
- we focus on Competencies (Observable behaviours)

References

ICAO. (2010). *Doc. 9835 -Manual on the implementation of ICAO Language Proficiency Requirements.* Montreal, Canada.

ICAO (2010). *Doc. 9432 - Manual of radiotelephony.* Montreal, Canada.

ICAO (2010) *Annex 10 Vol. II – Chapter 5.* Montreal, Canada.

ICAO (2017) *Doc 10056 - Manual sobre instrucción y evaluación basadas en competencias para controladores de tránsito aéreo*. Montreal, Canada.

ICAO (2015) *Doc. 4444 – Air traffic management.* Montreal, Canada.

Appendix 1

AIR TRAFFIC CONTROL SIMULATION

ATSU: Tower – Phase 1

Objective: The student will be able to use Standardised Phraseology in routine situations whenever aplicable, and plain English in non-routine situations, in a simulated scenario, in the manouvering and movement area as it is established in Doc. 4444 ATM and Doc. 9432 Manual of Radiotelephony, Annex 10, Doc. 10056. Doc. 9835.

The student is expected to use at least these functions:

- Give an order/amended order/alternative orders
- Cancel an order
- Give advice/information/instruction on how to do
- Announce a change.

Domain :

- Air traffic rules, speed, distance/range, position.
- Traffic information. Procedures.
- Ground movements and services.
- ATIS, METAR information.

Competencies assessed

- Speaks clearly, accurately and concisely.
- Uses appropriate vocabulary and expressions to convey clear messages.
- Uses standard radiotelephony phraseology, when prescribed.
- Adjusts speech techniques to suit the situation.
- Demonstrates active listening by asking relevant questions and providing feedback.
- Verifies accuracy of readbacks and corrects as necessary.
- Uses plain language when standardized phraseology does not exist or the situation warrants it.

Appendix 1

Meteorological Information:

Metar 130/10 6000 HZ 15/13 Q1001

Wind one-three-zero degrees, one-zero knots. Visibility six kilometres. Haze. Temperature one-five, dewpoint one-three. QNH one-zero-zero-one.

Aircraft involved:

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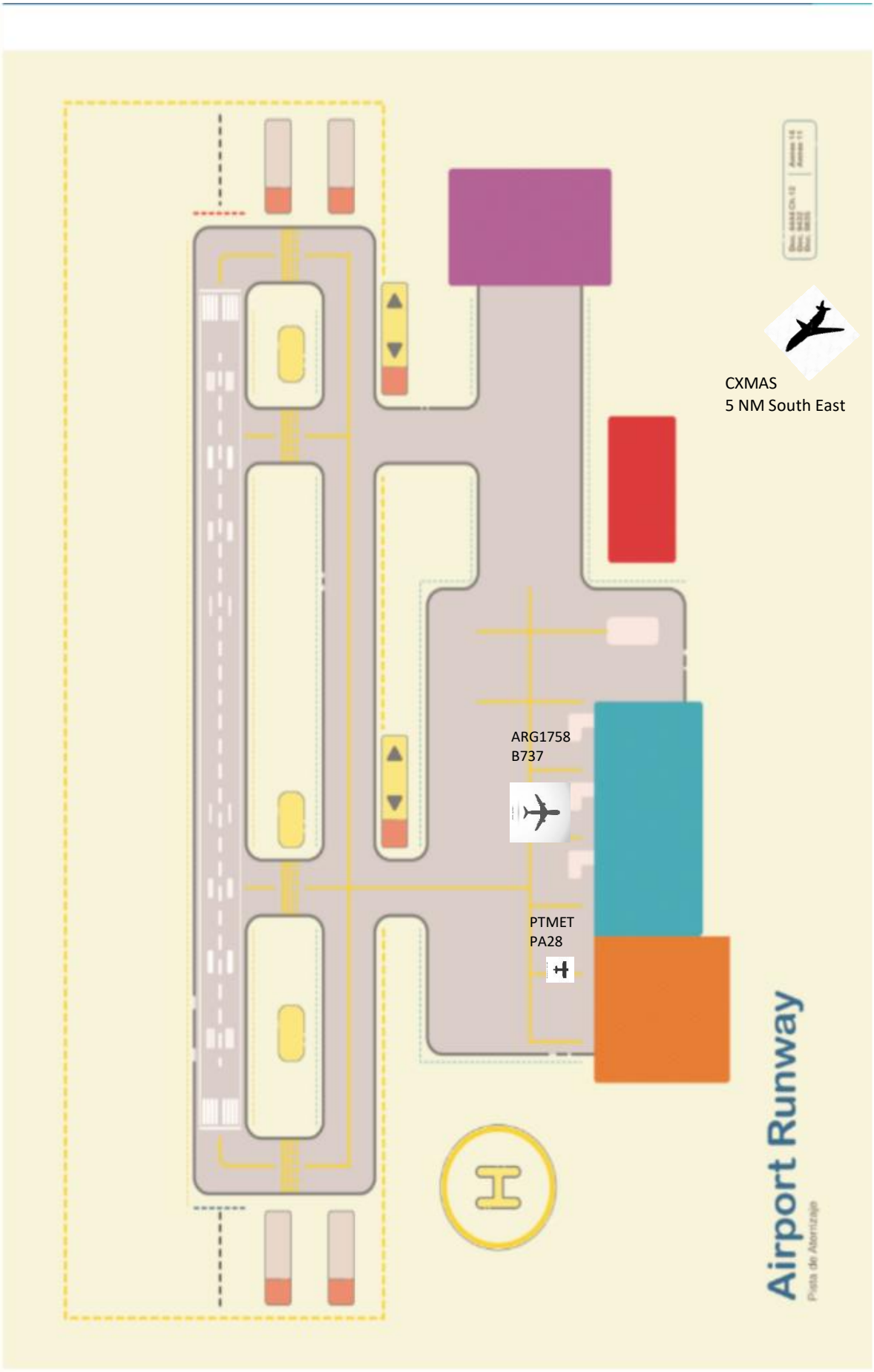
Appendix 1


CXMAS
5 NM South East
ARG1758
B737
PTMET
PA28
Airport Runway

Appendix 1

Examples of dialogues :

CXMAS : EZEIZA TOWER, This is CXMAS, 5 miles south, for landing.

ATCO: CXMAS, EZEIZA TOWER, Roger, wind 130, 10 knots, visibility 6 kilometres, HAZE, temperatura 15, dewpoint 13, QNH 1001.

CXMAS: *(readbacks information)*

ATCO : CXMAS, Readback correct. Descend to 3000 ft Join downwind for runway 11, report downwind.

ARG1758: EZEIZA TOWER, ARG1758 Gate number 3 request departure information and ATC clearance to Iguazú.

ATCO: ARG1758 roger. Are you ready to copy?

ARG1758: Ready to copy, ARG1758.

ATCO: ARG1758, Cleared to Iguazú, via flight planned route, ……