



A blend of training methods to increase the efficiency of ATC simulation and maintain consistent quality

eBriefing for ATC training

By Dragan Milanovski

"Just as shopping for groceries was a relatively simple affair fifty years ago, when there were fewer ingredients on offer, but is so much more of a struggle now when as a shopper you are bombarded with thousands of possibilities, so the selection of learning media has been made so much more complex with the arrival of dozens of online opportunities.

An abundance of choice makes it so much harder now for professionals to design learning interventions, which is perhaps why they so often keep it simple by sticking to familiar options – easier in the short term, perhaps, but undoubtedly missing a whole load of tricks."

Clive Shepherd



Dragan Milanovski

is an ATC training expert at the EUROCONTROL Institute of Air Navigation Services in Luxembourg.

Most of his operational experience comes from Skopje ACC where he worked for a number of years on different operational posts.

Now, his day-to-day work involves ATC training design as well as Initial Training delivery for Maastricht UAC.

Traditional cuisine - a familiar option

Briefings in relation to ATC simulation training are training events that take place immediately before the start of a group of exercises introducing new learning items. The event is delivered by, and mostly focuses around an ATC instructor. Usually, there is very little or only one sided interaction with the group of students. Not all the students are equally willing to contribute to the discussions.

A traditional briefing contains:

- information about the global objectives, traffic scenarios, airspace structure, activation of restricted airspace, CDRs in use, RWY in use, meteorological conditions, NOTAM, SIGMET, etc...
- a reminder/revision of the theoretical elements required for the simulation session;
- a detailed explanation of the new controlling method/ technique (if one is introduced).

As such, briefings are a vital link between theory and practice. The better the briefings are, the greater the learning benefit is from the practical simulation, especially during the first few exercises within the series.

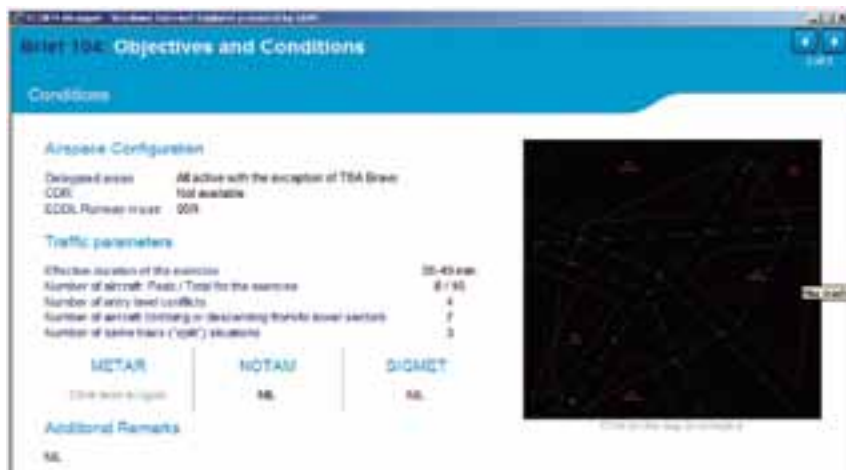
I am sure most of you can recall from your training days that there were briefings and briefings, even when delivered by the same instructor. Why? Well, let's have a look at the following example - let's say we have to deliver a brief-

ing about using rates to ensure vertical separation of crossing track traffic. Taking the traditional approach the shopping list is very short; we need an ATC instructor and a classroom.

He/she will have to start on the morning before the simulator exercise is scheduled by informing the students about the objectives and exercise conditions based on a slide setting out the details such as the one shown.

There is nothing wrong with the approach taken so far, except the fact that valuable instructor time is spent on the information part of the briefing where the required information is passed to the students through lectures. There is very little added value (if any) when an instructor is delivering this part. Some would even argue that there is a greater learning effect when students acquire this information through self study. At least it gives them greater responsibility for their training.

Next, the instructor will have to remind the students about the theoretical knowledge directly related to the forthcoming simulation. In our example, these are: aircraft performance data, factors affecting aircraft performance (vertical speed in particular), application of vertical separation based on use of rates, etc. Let's say we have a very experienced instructor who is always motivated and well aware of the important bits worth mentioning. Even with these favourable conditions, when revising theoretical elements required for the session ahead, under time constraints, the instructor has to take a group ap-



proach. However, not all students in the group have the same understanding. Some will find this part very boring (I have seen this already 5 times during the lessons) – others will find it insufficient (I am not sure I understand this correctly, I did not have time to study, but I do not want to show this by asking now).

The situation is even worse when it comes to checking the students' knowledge. Usually, an experienced instructor will ask several questions to verify the students have acquired the right understanding. But here, a different instructor will ask different questions. This might be all right, but will the questions cover all the aspects? Will the instructor always ask the "right" students? One thing is for sure - the instructor delivering the briefing cannot ask all the students all the questions and then provide them with appropriate feedback individually.

Furthermore, the race against time does not allow the instructor to pay attention to details and dig deeper if necessary. I believed that when I left the classroom, I had a good indication of the students' understanding of required theoretical elements. Needless to say, very often I found that this was not the case, and I had to give more explanations after the simulation.

Additionally, the discussion about new controlling methods/techniques is not always sufficiently well illustrated, as the allocated time does not allow use of several examples. Even with the best preparation and intentions, it can hap-

pen that one or a number of details are omitted by the instructor. The instructor from the story will enjoy his coffee afterwards asking himself "Did I say that once a rate is assigned it has to be monitored on radar and followed up with corrective actions if necessary?"

Students' participation ranges from very active (always asking the right questions) to very passive (say yes to everything – do not ask questions). Sometimes, the instructor delivering the briefing will also "spice it up" with a bit of personal preference and use some of the time on "war stories". Believe me, this is in our nature, no matter how hard we try - we cannot avoid it. Yes, the students always find this amusing; however, the training value is very limited at this point in time.

Going back to our example, one instructor would say "always ask if the aircraft is able to maintain the rate before you assign it, once I had an incident where the pilot reported late that he was not able to maintain it, ok it was busy, but..." and that is how it starts. Another instructor would say "don't waste your time asking at all, just be realistic with the rates and rely on your knowledge, if unable the pilot is supposed to tell you..." I can think of several other pieces of advice here which I am sure we could continue to discuss for hours in order to decide which one is right / better. You must understand how difficult it is for the student to distinguish what is

standard, common practice or a personal preference.

Finally, the training is organised in such a way that following the briefing the simulation training starts after a short coffee break. There is no time whatsoever to allow the students to fully grasp the concept before we actually require the use of it in simulation. In the worst case scenario, it takes two to three exercises before the student realises what is expected of him/her.

Due to the training delivery method (lesson/lecture with limited interaction) used in practice, we experience the limitations mentioned above. While traditional cuisine is appealing (familiar) and it does the job (you are not hungry after a meal), you cannot guarantee the desired nutritional values and you cannot cater for different styles.

The ever increasing "production pressure" on ATC training does not allow any room for slacking in a student's progress. Something needed to be done to increase the learning value of the first few training sessions following the briefing.



eBriefing for ATC training (cont'd)

A list of ingredients: eBriefing concept

The new approach consists of the following items which together replace the traditional briefing:

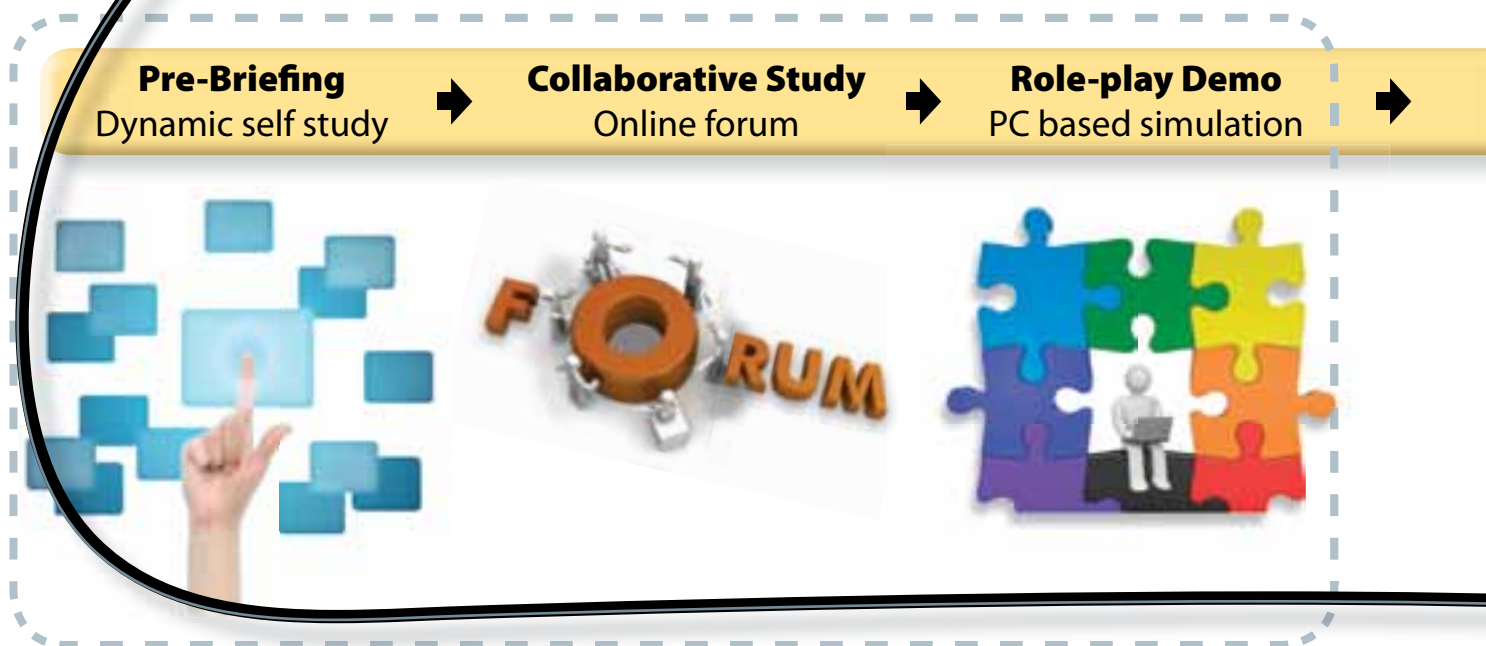
- **Pre-briefing** – a dynamic self study module which takes place a day before the simulation.
- **Collaborative study period** – until the morning before the simulation;
- **Role play demonstration** – immediately prior to the simulation (facilitated by an instructor).

The Pre-briefing guarantees participation from all students. It is available online from any location, where students may, at their own pace, acquire the following:

- objectives and conditions (a small e-learning module covering the information part of the briefing);
- the controlling methods/techniques (explained in a structured way with numerous illustrations and examples as illustrated below - where students can take a personal approach to learning, as well as revising some of the theoretical elements required for the session);
- the new phraseology (with examples and explanations);
- recorded instructor demo (a video taken from the simulator where an instructor explains the application);
- FAQs;
- Questionnaire (online self assessment as also illustrated below, which provides individualised feedback to the answers given)



e-Briefing concept



An online forum is associated with the pre-briefing for the students and instructors for the collaborative study. Students are encouraged to post questions and receive answers from their instructors. It gives an opportunity to the instructor facilitating the role play demonstration to prepare and adjust if necessary for the final part of the eBriefing. If it is necessary to revise some of the theory or just practice the new phraseology, there is now more time available to the student to digest this information, rather than just during a coffee break.

A typical question entered on a screen like that illustrated would be: "Is it better if I issue a rate limit (until passing FLxxx) right away with the restriction, or monitor on radar and then cancel the restriction once it is not required with a "resume normal rate of climb"? And as you might guess, two instructors will give you at least three different opinions on this.



ATC SIM Training



Time →

Brief 104: Methods and Techniques:
Use of RCL/RCD to ensure separation on crossing tracks
Application: Step 1

Application

Step 1: Determine the point at which the vertical separation needs to be established.

Step 2: Estimate the required RCL/RCD and verify it is within sight envelope.

Step 3: If not the clearance without RCL, provide a limit when required.

Step 4: Advise the RCL/RCD.

Start from the crossing point and add a two minute buffer. This will ensure vertical separation is re-established when the aircraft is ahead 10min before the crossing point. When dealing with slow (or slower) aircraft add 10min buffer instead of the two minutes.

HJ8078 (B737) needs to climb FL370. Crossing traffic requiring the climb is B7477801 (A330-300). Please advise a buffer time to ensure vertical separation is maintained for the climb.

The European Organization for the Safety of Air Navigation

Discussion forum

LOT281 (B734) is EDDV arrival, routing RGN-OSN-ROBEG and has been cleared to descend to FL250. LDA254 (F308) is EDDL departure, routing OSN-ROBEG, under control of EDDL. FSN890 (A330) is at FL320 routing SASUM-OSN-DOH.

What is the most appropriate action for the ICC to take?

- * Request from EC to stop LOT281 at FL270 and allocate FL260 to LDA254
- * Allocate FL310 to LDA254, Düsseldorf separation with LOT281.
- * Request EC to transfer LOT281 to Düsseldorf before making the final decision.
- * Request LDA254 FL340 upper level assured and release for turns, and request a lower level for LOT281

0 out of 3

That is incorrect.

The correct answer is: Allocate FL310 to LDA254, Düsseldorf separation with LOT281.

Discussion forum

General >> Ask a question >> Show brief 1 questions

Post	Subject	Score	Reply	Created	Answered	URL
✓	Re: Brief 1 questions	Michael FOLKNER	3	22-Feb-2011 22:28		
✓	Re: Re: Brief 1 questions	Gregory HLA80V84C	8	24-Feb-2011 00:02		
✓	Re: Re: Brief 1 questions	Gregory HLA80V84C	8	22-Feb-2011 11:07		

Re: Brief 1 questions

Question:

1. Is it mandatory to include the significant point following the existing COP in the route instruction?

The following instruction section mentions:

"Coordination is not required between two straight-through UIC sectors for routing an aircraft direct to the significant point following the existing COP provided that the route position symbol is, at the transfer of control point, be within 5 km of the centre line of the ATS route"

Example of route instructions:

FL310: "Instructed route: DUC224, FL310"

EC: "DUC224: Instructed route, identified, proceed RGN, OSN, ROBEG"

FL310: "Instructed RGN, OSN, ROBEG, DUC224"

Created on: 22-Feb-2011 22:28

Answer:

eBriefing for ATC training (cont'd)



The role-play demonstration is an instructor-led training event where students may demonstrate the acquired knowledge by playing different roles in a group simulation taking place in the classroom on a PC-based simulator. A traffic scenario that may be solved in several different ways is presented to the students. Solutions are compared and pros and cons are discussed. This setup enables active participation from all the students in the group and enables the instructor facilitating the event to leave with better information regarding the group's theoretical understanding, in addition to ensuring that there is no misinterpretation.

Taking a new approach to briefings, the instructor from our example will encourage the students to find different options for facilitating the climb of ABC123 to FL370 to take account of the need to cross DEF567 at FL330. For example:

1. Issue a clearance to ABC123 to FL370 and assign 1500 fpm or greater until passing FL340;
2. Issue a clearance to ABC123 to FL320, monitor the rate and decide later whether to continue the climb further or wait for the cross;
3. Issue a clearance to ABC123 to FL370, monitor the rate and assign a rate restriction if required;
4. Establish radar separation by vectoring and then issue a clearance to ABC123 for climb;

Students will try to execute the solutions in a group simulation using the knowledge they acquired from the pre-briefing. Then everyone can see the differences and compare the pros and cons.

Then a student will probably say "well, what if ABC123 reports unable to maintain 1500 fpm later on?" The situation can easily be created (a few clicks) on a PC-based simulator and the discussion continues...

Cooking a four-course meal: Implementation

You can guess that the shopping list is quite long; however, everything you need is at least available. Designing the content is a huge and demanding task, but you can look at it as a "one-off investment" of training design expertise which has immediate benefits. The idea also needs the utilisation of four independent software systems:

- A system that will support dynamic content delivery (Learning Content Management System). Organising the briefing items on a separate platform is very important for easy management and ensures flexibility later on. Adding or removing briefings or briefing items is now manageable with very limited expertise and effort. All changes are automatically tracked and are available for future reference.
- A system that will provide user management and smooth delivery (Learning Management System), whilst tracking students' activities and ensuring easy reporting (self progress reporting as well as group reporting and comparisons).
- A system to manage, deliver and store the online questionnaires.
- Finally, a realistic, flexible and easy to use/control PC-based ATC simulator with pause, immediate rewind / fast forward functions and instant change of aircraft position / heading / speed etc. This is very important as the objective is to compare several solutions to one situation or create a scenario based on students' questions.

Designing the content is a huge and demanding task, but you can look at it as a "one-off investment".



His briefing must be very good...
I often find myself listening to him.

We found that ensuring that these four different software packages worked in harmony without “hiccups” was quite a challenge. Thanks to the expertise and support of the e-learning team, we now have the concept working in practice and, so far, it has not failed to deliver.

Eating a well balanced meal: Benefits

This non-conventional approach to briefings helped us to overcome the limitations listed above and to significantly contribute towards higher efficiency during the practical simulation training.

Students are now more involved in the process of preparing themselves for the simulation sessions. They are able to understand that being involved means easier acquisition of new skills in practical training. Their contribution during briefings is also a valuable feedback and motivation for the instructors and training designers who do their utmost to create a successful and pleasant learning environment. Overall, we can say that students are now showing greater commitment to, responsibility for

and ownership of, their own training. Many believe this is crucial for success.

Initial experience shows that the students are highly receptive to the concept. This is confirmed by their significant effort (well above the expected) and the consistently positive comments which are obtained through confidential student feedback. The learning effect is greater if one enjoys the learning process.

An added benefit of the eBriefings is that the briefing items are now available to the students and reusable at any time later on. Revising a controlling method/technique is now just a click away. This is a huge advantage over classic briefings where, once the instructor walks out of the door, the briefing is over and usually methods/techniques are not revised.

Instructors are able to use the same system (with less detail) for self-briefing prior to the simulation. Pedagogical guidance is also included (support, key elements). This enables greater flexibility in allocating instructors to a course whilst facilitating consistent and high quality training delivery from one course to another.

Finally, an important safety culture of ensuring a proper self-briefing prior to assuming operational duties is addressed early in the training of the future ATCOs, which is not the case using the traditional approach where instructors are responsible for briefing students until relatively late in training or sometimes until validation.

Aftertaste: Conclusion

Replacing the traditional briefings with blended learning is not about replacing a meaty dish with a vegetarian, nor is it about offering a choice of dishes. It is more about offering a gastronomic dinner where every single detail is well thought out, where taste and nutritional value cater for different styles. Not to mention the bottle of wine...

The eBriefing concept does not completely replace face-to face training with e-learning, just as it does not reduce overall training time. However, it certainly allows more effective use of instructor time in the classroom. Since learning retention is much higher (80%) by “doing” rather than listening (5 – 10%), the potential for self briefing using eBriefing is immense. I also believe that it makes the ATC simulation training a lot more efficient, more sustainable and more enjoyable for the students. **S**