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**Welcome to CALMet XI**

With the CALMet Workshop, CALMet Online and CALMet Commons we, as CALMet addicts, hope to create a world wide forum were we can share experiences, expectations, and get new ideas for applying emerging technologies and strategies in meteorology and hydrology education and training. We see this as an opportunity to collaborate and network with international training entities involved with workforce development in support of national meteorological and hydrological services.

During this Workshop we will zoom in to the following themes:

* Competency-based training and assessment
* Adopting new teaching strategies and innovations
* Quality control and trainer competencies
* Collaboration and the Global Campus

Next to that we will look to CALMet’s future.

We wish to express our thanks to this year’s hosts, Korea Meteorological Administration, for their tremendous hospitality and hard work to allow us to hold the workshop at their facilities in the city of Seoul.

In this booklet you will find all presentation abstracts for the sessions, along with a timetable of the programme. Please keep it available as your guide to events.

Best wishes for an enjoyable and productive week,

**The Conference Working Group: KMA and Local Organizers:**

Bruce Muller, The COMET Program Mr. Cheong Seonghoon

Heleen ter Pelkwijk, KNMI Ms. Yim Nayoung

Wilfried Jacobs, DWD

Liesl Dyson, University of Pretoria

**List of Workshop Participants**

Dr Wilfried Jacobs, Deutscher Wetterdienst (DWD) - BTZ, [wilfried.jacobs@dwd.de](mailto:wilfried.jacobs@dwd.de)

Mr Yong Wang, WMO RTC Nanjing, [wy92380@163.com](mailto:wy92380@163.com)

Dr Larisa Timofeeva, Russian State Hydrometeorological University, [tilarisa@gmail.com](mailto:tilarisa@gmail.com)

Ms AILEEN SEMPLE, WMO, [asemple@wmo.int](mailto:asemple@wmo.int)

Mr Mustafa ADIGUZEL, World Meteorological Organization, [madiguzel@wmo.int](mailto:madiguzel@wmo.int)

Dr Anna Ghelli, ECMWF, [anna.ghelli@ecmwf.int](mailto:anna.ghelli@ecmwf.int)

Mr IVAN SMILJANIC, DHMZ, [ica\_64@hotmail.com](mailto:ica_64@hotmail.com)

Mr Vesa Nietosvaara, EUMETSAT, [vesa.nietosvaara@eumetsat.int](mailto:vesa.nietosvaara@eumetsat.int)

Prof EDNALDO SANTOS, DCA/IF/UFRRJ, [edmeteoro@hotmail.com](mailto:edmeteoro@hotmail.com)

Mr Bruce Muller, UCAR/COMET, [bmuller@ucar.edu](mailto:bmuller@ucar.edu)

Ms Heleen ter Pelkwijk, KNMI, [pelkwijk@knmi.nl](mailto:pelkwijk@knmi.nl)

Mr Ian Mills, EUMETSAT, [Ian.Mills@eumetsat.int](mailto:Ian.Mills@eumetsat.int)

Mr Brad Snyder, Environment Canada, [brad.snyder@ec.gc.ca](mailto:brad.snyder@ec.gc.ca)

Mrs Graciela Angela ROLON, Servicio Meteorologico Nacional, [grolon@smn.gov.ar](mailto:grolon@smn.gov.ar)

Mrs Marinés Campos, Servicio Meteorologico Nacional, [marinescampos27@gmail.com](mailto:marinescampos27@gmail.com)

Mr ASALU AMOS, NATIONAL METEOROLOGICAL TRAINING SCHOOL, [asaluamos@yahoo.co.uk](mailto:asaluamos@yahoo.co.uk)

Mrs Yuliana PURWANTI, 4800, [ry.purwanti@gmail.com](mailto:ry.purwanti@gmail.com)

Dr Piia Post, University of Tartu, [piia.post@ut.ee](mailto:piia.post@ut.ee)

Mrs Maja Kuna-Parrish, EUMETSAT, [maja.kuna@eumetsat.int](mailto:maja.kuna@eumetsat.int)

Dr Patrick Parrish, WMO, [pparrish@wmo.int](mailto:pparrish@wmo.int)

Mr Tsvetomir Ross-Lazarov, COMET, [tlazarov@ucar.edu](mailto:tlazarov@ucar.edu)

Mr Obed Phahlane, Agricultural Research Council, [mogohlwana@gmail.com](mailto:mogohlwana@gmail.com)

Mrs Jah Salmihani Mansor, Malaysian Meteorological Department, [jah@met.gov.my](mailto:jah@met.gov.my)

Mr PHILIP MERRITT, MET OFFICE, [philip.merritt@metoffice.gov.uk](mailto:philip.merritt@metoffice.gov.uk)

Dr Mark higgins, EUMETSAT, [mark.higgins@eumetsat.int](mailto:mark.higgins@eumetsat.int)

Mr EDUARD PODGAISKII, Russian State Hydrometeorological University, [podgaisky@gmail.com](mailto:podgaisky@gmail.com)

Mr Ji Wenbin, China Meteorological Administration Training Centre, [jiwenbin@cma.gov.cn](mailto:jiwenbin@cma.gov.cn)

Mr Mark Schwarz, MetService NZ Ltd, [schwarz@metservice.com](mailto:schwarz@metservice.com)

Mr Han Sang-Un, Korea Meteorological Administration, [drhankma@korea.kr](mailto:drhankma@korea.kr)

Mr Seonghoon Cheong, KMA, [csh@korea.kr](mailto:csh@korea.kr)

Mr Nicolas Moyo, University of Botswana, [nicholas.moyo@gmail.com](mailto:nicholas.moyo@gmail.com)

Dr Hee Jin In, KMA, [hjin@korea.kr](mailto:hjin@korea.kr)

Ms Nayoung Yim, [nyyim@korea.kr](mailto:nyyim@korea.kr)

**Conference Schedule**

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**The Abstracts**

**Nr:** 3 **The characteristics and enlightenments of "Small-world effect" in Meteorological education and training**

**Theme:** Collaboration and the Global Campus

**Author:** Wenbin Ji, China Meteorological Administration Training Center, (jiwenbin@cma.gov.cn)

**Co-Author(s):** Hou Jinfang, China Meteorological Administration Training Center

**Abstract:**

The experimental studies on Small-world effect (also known as the Six Degrees of Separation) have proofed that two people all over the world randomly, who never knew each other, can establish their contacts through only several intermediators. And, these actual relationships can be abstracted as a network or system in nature. Meanwhile, most of the actual network systems, based on the studies of Complex Network, have 3 main features such as Small-world, scale-free and Large Clustering Coefficient, which are also the main characteristics of WS and NW Small-world network evolution models.

In the education and training ‘network’ systems, this effect is embodied in social and online learning networks, where people or institutions are represented as nodes, and at the same time, the existing contact between two nodes is represented as an edge. Despite the scale of this network seems large, the distances between nodes are far smaller than our imagination, in fact, the network is still relatively close together, and the roles of the nodes are being played quite differently. There is a close relation between network structure and its function. In additions, the evolution of things is spontaneously forwarding orderly in the Small-world environment, and the purpose of studying on the characteristics of network structure is to analyze the relationship between its characteristics and behaviors, or in other words, the structural characteristics of network influences its behaviors.

China has large numbers in both meteorological station and staff. However, the Chinese meteorological education and training has promoted the formation of Small-world effect by creating its three-leveled organizational and architecture and learning demonstration sites, which shortens the distances among people and resources. With the proposed concept of global campus, the Small-world effect would play a subliminal role in offering enlightenments in establishing contacts among the loose coupling institutions and communities, promoting collaboration and evaluating the effect of organizational and topological structure in education and training system.

**Nr:** 4 **Quality assurance approaches when assessing competence**

**Theme:** Quality control and trainer competencies

**Author:** Philip Merritt, Met Office, (philip.merritt@metoffice.gov.uk)

**Abstract:**

This will be a presentation which looks at the range of quality assurance approaches which are available to us to ensure that we maintain the highest quality in our assessment approach. This will consider how we can identify subject matter experts who will be the arbiters in terms of the overall level and also how discussing with our peers can help to identify a consistent approach with assessing style and avoid typical issues. When we have completed these verification processes, it will then look at the way that this can build into quality management systems and procedures to ensure that the assessor team continue to improve the way they work. The presentation will also consider how we can work with other organisations to ensure that we are consistent with required levels and the expectations of the sector.

**Nr:** 5 **Providing Forecasters for the Future**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Mark Schwarz, MetService NZ, (schwarz@metservice.com)

**Abstract:**

The meteorological game is ever-changing. With numerical model improvements and the increasing sophistication of consumers of meteological information, we must evolve to continue adding value and meeting our user's needs. A key component of this evolution is in training, as well as the in-service training of existing staff. Here I will focus on the changes required in acquiring and training new meteorological staff and how MetService NZ aims to meet this challenge.

**Nr:** 6 **Harmonizing Competency-based Training and Assessment**

**Theme:** Competency-based training and assessment

**Author:** AMOS ASALU, National Meteorological Training School, (asaluamos@yahoo.co.uk)

**Abstract:**

This study presents an approach towards harmonizing competence-based training (CBT) and assessment that enables a learner of National Meteorological Training School to appropriately perform duties with confidentiality any time and place after training. It is known that meteorology is a science of practical where people can generate competences that are used to solve problems in communities and at individual level. While this is supposed to be so, the study shows that at the meteorological and hydrological service delivery areas, gaps exist manifold. As mentioned above, most gaps have been observed in the ways that the meteorological /hydrological personnel carry out their duties at work places; compete in the job market and the extent in which they can manipulate their knowledge at individual level in order to survive. In the initial study, investigation had a task to find out why the personnel had behaved in that way. However, in the course of study, it was found that training was a major factor behind! It was more of theory than practice and trainer geared than learner. This study uses learner based training method which puts a learner in the forefront. It defines a role of a trainer and that of a learner. It exposes a learner to a variety of learning options and gives a learner freedom of speech. It uses exhaustive tripartite assessment methodology to ensure competences learnt by a learner have been achieved fully.

To harmonize CBT and assessment, the study used school diploma students and teachers. The following methodologies and practices were used to achieve this goal during the learning process: motivated learning; self discovery; institution to institution dialoguing; staff discussions; student group studies; student presentations; hands on practices and online learning.

The study identifies two professional assessors one at school and the other from chosen stakeholder organization for assessment of learners. These assessors were using a well structured (specially designed) assessment tool. The objectives of this study were mainly threefold : To forge ways in which competent meteorological /hydrological personnel can be produced; to produce self motivated meteorological/hydrological personnel; to produce all round meteorological /hydrological personnel. During investigation, the study found that teachers were able to identify many competences from their teaching syllabi which also applied in other meteorology/hydrology related areas and were teaching with all interest. Students were not only able to put into practice competences taught to different areas other than at National Meteorological Centre only, to display their talents on hands on display board but were also able to discover many talents and to participate fully during learning process. The study showed that CBT and assessment were key to competence generation for learners. The results indicated that CBT and assessment were found to be a function of teachers, learners, and end users. These results are encouraging and if this is fully proven it will provide one of the best learning solutions to competence generation and filling gaps during delivery of services in meteorology and hydrology.

**Nr:** 8 **To become and to be a Tele-Tutor – THE challenge for Trainers**

**Theme:** Quality control and trainer competencies

**Author:** WILFRIED JACOBS, Deutscher Wetterdienst (DWD), (wilfried.jacobs@dwd.de)

**Abstract:**

A big challenge for many trainers is to overcome their hitherto existing training style in order to act successfully as a Tele-Tutor. Manifold and high competences and the preparedness to be up to speed are necessary. Without technical competences a Tele-Tutor would not sovereignly operate the training equipment and would not be able to organize the training environment accordingly. High competences in media and communication are further preconditions for choosing the most efficient training tools. Extraordinary social competences are crucial for delivering virtual training that requires a special sensibility due to the missing personal contacts. Finally, a Tele-Tutor cannot deliver virtual training of high quality without according competences in didactics.

It is likely that several trainers need training for their understanding and for the internalization of their new role as a Tele-Tutor. The purpose of this Workshop is not only exchanging experiences but also formulating ideas for providing training of trainers in order to enable them to act as Tele-Tutor. These results could be an initiative for developing and organizing training events in that way, e.g., under the umbrella of the WMO Global Campus.

In order to give first ideas to the training community three groups will be established:

1.Technique, media and possible limitations

2.Communication and other social aspects

3.Didactics, especially for Tele-Training.

**Nr:** 10 **Assessment as a Learning Activity**

**Theme:** Competency-based training and assessment

**Author:** Patrick Parrish, WMO, (pparrish@wmo.int)

**Co-Author(s):** Maja Kuna-Parrish, EUMETSAT

**Abstract:**

There are many different reasons to perform an assessment of learners. Assessment can be used to determine if learners are ready for a course or lesson. It can help determine if learners are learning what you hoped, and whether you might need to adjust your teaching. It can also be used, of course, to measure students against some standard, to assign them a grade or certificate. But these are all ways that assessment primarily serves teachers. Assessment can also serve learners by guiding them to the content and practice they need most, providing feedback on how well they are learning, and helping them consolidate their learning by providing an opportunity for reflection and analysis of what they have learned.

This workshop will help trainers design assessments that will become opportunities for learners to gain more from their learning experiences. Working as a full group and in small groups, participants will identify assessment opportunities in example courses, and then in their own courses. We will consider Initial, Formative, and Summative assessments, as well as the variety of assessment types and tools available. Participants are encouraged to bring plans for their current projects to use as cases to be worked with.

Depending on time and facilities available, a Moodle platform would be used for some activities and for granting a badge for completion of the workshop. The scope might need to be adjusted downward for anything less than 2. 5 hours. Even more time could be utilized, if available.

**Nr:** 12 **What Do Competency Frameworks Mean for Trainers**

**Theme:** Competency-based training and assessment

**Author:** Patrick Parrish, WMO, (pparrish@wmo.int)

**Abstract:**

Competencies are not incantations that suddenly solve all our training problems. Just invoking them in a course description does not magically create competency-based instruction. Implementing competency-based instruction impacts every aspect of the training process, from how we identify needs, to how we determine the intended learning outcomes, how we choose the learning activities, and particularly how we assess and document training completion. This presentation will describe the ways that competency frameworks have to impact our training decisions and designs if we are to take full advantage of them.

**Nr:** 14 **Competency Training**

**Theme:** Competency-based training and assessment

**Author:** Yong Wang, WMO RTC Nanjing, NUIST, (wy92380@163.com)

**Abstract:**

Competency training should be productive and meeting the needs of trainees. There has been a need for competency training for aeronautical meteorological forecasters and observers in many developing countries/regions according to the implementation guidance of WMO “Aeronautical Meteorological Forecaster and Observer Competency Standards” approved by WMO Cg-XVI in 2011.

In this regard, WMO RTC Nanjing in collaboration with Macao Meteorological and Geophysical Bureau held several bilateral trainings, including four “Training Course for Aeronautical Meteorological Forecasters”, three “Training Course for Aeronautical Meteorological Observers” and “Seminar on WMO and ICAO documents and meteorological knowledge”. In addition, it respectively held “Training Course for Aeronautical Meteorological Observers from Mozambique”, “Training Course for Aeronautical Meteorological Forecasters from Mozambique” and “Training Course for Aeronautical Meteorological Forecasters from Cape Verde”.

**Nr:** 15 **Feedback learning and development strategy**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Heleen ter Pelkwijk, KNMI, (pelkwijk@knmi.nl)

**Abstract:**

The past few months I have been working on a learning and development strategy for all KNMI personnel. The aim is to implement this learning and development strategy into the HRM strategy and build a corporate university. Creating this strategy I made use of lessons learned in the WMO train the trainer in Sibiu, the WMO guidelines for trainers and a book about strategy of many Dutch corporate universities. By the time this session takes place most probably the first steps already have been taken to implement this strategy, but there will be room for improvements. During this session I like to discuss this plan with you and hope to get feedback from you on my ideas.

**Nr:** 16 **Learning through gaming**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Anna Ghelli, ECMWF, (anna.ghelli@ecmwf.int)

**Abstract:**

Games have become an important part of training programmes and ECMWF has been using them for a number of years. In the session we would like to play a couple of games on the use of probabilities for decision making. Participants will be asked to take decisions to reduce risk of flooding and adverse weather.

**Nr:** 17 **Simulator as assessment tool: How does it work?**

**Theme:** Competency-based training and assessment

**Author:** Heleen ter Pelkwijk, KNMI, Ian Mills and Mark Higgens, EUMETSAT

**Abstract:**

Since December 2013 providers of aeronautical meteorological information have to demonstrate that their people, who provide these services, are competent to do their job. While some Meteorological Services use simulators to demonstrate these competencies, others are wondering how to do this. During this interactive session we like to discuss how we best use a simulator as an assessment tool, show some examples and talk about the advantages and disadvantages of this assessment method.

**Nr:** 18 **The Flipped (and Twisted) Classroom**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Patrick Parrish, WMO, (pparrish@wmo.int)

**Abstract:**

The use of the Flipped Classroom approach, in which the more information-based content of a course is delivered in a self-directed mode outside of the classroom (through recorded lectures or online resources), and classroom time is used to perform guided practice exercises or other more interactive activities. This approach maximises the guidance that can be provided by teachers during practice, rather than leaving students to sometimes struggle on their own, and allows them to learn other content at their own pace. The Flipped Classroom is an innovation, but one that still continues the tradition of the teacher as provider of information and the student as consumer. Other models of instruction advocate putting students more in the role of content creators, with teachers as content validators and coaches. This additional twist is intended to promote stronger self-efficacy in students and help them develop higher level cognitive skills for use in a more complex and connected world.

**Nr:** 19 **Communicating Seasonal Weather Forecast Information on Public Radio Stations**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Obed Phahlane, Agricultural Research Council, (Phahlaneo@arc.agric.za)

**Co-Author(s):** Samuel Molekwa, Agricultural Research Council - Institute for Soil, Climate and Water

**Abstract:**

The skill of seasonal weather prediction has improved substantially in South Africa over the past two decades. However, the lack of understanding of the complexities of weather and climate change phenomena plays a major role in the acceptability of this information. Developing effective weather forecast information dissemination and capacity development methods is a vital component in preparing farmers to cope with weather variability related disasters.

A study was conducted to evaluate radio as a method of weather forecast information dissemination in subsistence farming. Two radio stations were selected because of the nature of their listenership: Thobela FM broadcasts in Sepedi in Limpopo Province and Motsweding FM broadcasts in Setswana in North West Province. Broadcasting slots were selected at the same hour to minimise duplication of listenership and sampled respondents during questionnaire data collection since minimal provincial broadcasting overlap is very important for sampling and data quality in the study.

A web-based questionnaire was developed to evaluate the impact of information discussed on the talk shows on the respective radio stations. The questionnaire was hosted on the Agricultural Research Council’s website and the seasonal weather forecast discussed during the talk show was uploaded before the broadcast. The number of people accessing the radio station and ARC's website was recorded before and after the talk show. The number of questionnaires accessed and completed will also be saved and analysed.

The understanding of meteorological phenomena like above-normal scenarios will be evaluated to determine whether it is a limiting factor to the acceptability of weather forecast information in subsistence farming.

**Nr:** 21 **Assessment for Learning**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Larisa Timofeeva, Russian State Hydrometeorological University, (tilarisa@gmail.com)

**Abstract:**

Assessment is a critical part of the Learning Cycle. Participants of the WMO TtT 2015 Online Course have declared this to be one of the most challenging competencies.

Existing approaches often need improvement, since they do not involve deep cognitive thinking and do not always reflect changes in education. Nowadays the focus shifts from Assessment of Learning to Assessment for Learning.

Peer Assessment and sufficient Feedback improve students’ learning and teachers’ teaching. J. Hattie (2009) research proves Feedback to be the best working teaching/learning approach.

Implementing Peer Assessment and Feedback requires special preparation and might be challenging. Some practical roles and experiences are presented. Benefits and challenges of these approaches for both students and trainers are discussed.

**Nr:** 23 **Are we in a Global system?**

**Theme:** Collaboration and the Global Campus

**Author:** Graciela Rolon, Servicio Meteorologico Nacional, (grolon@smn.gov.ar)

**Abstract:**

Are we in a Global system? What does it mean?

Advances in communication link us together, news is instantaneously global, and experts in different fields share their work. We are also connected due to natural disasters, concerns about climate change, and health prevention campaigns. As technology advances we are embedded (immersed) in a global system.

What have we done in this global system so far?

Argentina has a history of international collaboration and cooperation, being the first training centre in South America. Many professionals from the University of Buenos Aires (UBA) had relevant participation in the world. The regional centres have promoted cooperation, shared their expertise and their problems and have maintained a standard of quality.

The Training Department of SMN- RTC branch is working towards enhancing training in the region responding to an increasing demand, implementation of courses using online platform. We have taken a leap forward which led to improvements in communication, adopting new technologies, updating resources, improving the quality of our courses. We are concerned with both delivering training and building our training on a global scale.

The support offered by WMO and Eumetsat have boosted our capacity of improvement. The participation of our personnel in different events, projects and task teams enrich our training competency and have a direct impact in our training production. The participation in courses offered by Spain has proved successful, and we have benefitted greatly from Calmet ,Comet, and Vlab.

Therefore, we are already in a global system.

How is globalisation regulated? In meteorology there are evaluating commissions for papers, conferences and congress. WMO has generated regulations and Guidelines and quality system. But there are differences among universities and institutions. On the other hand training centres and trainers have many problems in common worldwide.

How do we assure the quality of training in meteorology worldwide, taking into account the cultural and language differences of each region?

We need a framework for communication, collaboration and cooperation, quality standards, valid certification and awards, exchange and development of resources and reduction of cost.

These are some of the goals in the proposal of Global Campus.

**Nr:** 24 **Quality Control and Trainer Competencies in Malaysian Meteorological Department**

**Theme:** Quality control and trainer competencies

**Author:** Jah Salmihani Mansor, MALAYSIAN METEOROLOGICAL DEPARTMENT (MMD), (jah@met.gov.my)

**Abstract:**

To ensure the quality control of the education and training conducted, a training committee had been formed in Malaysian Meteorological Department. It is responsible for appointing qualified trainers with priority to the masters or PHD holders or the experienced officers in the field related to the module or subject course meet the effectiveness of the training. The committee is responsible for the syllabus and training skills that are to be well planned. Courses conducted are based on the guidelines of the World Meteorological Organization (WMO): Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology, WMO-No.1083. These courses conducted meet the requirements of Malaysia Government Policy, the Public Sector Human Resources Training Policy that requires every civil servant must attend courses for improvement of knowledge and skills yearly. Evaluations by the courses participants also help to continually upgrade and improve the quality and effectiveness of the courses.

**Nr:** 25 **Baltic+ -- a regional initiative in teaching and training satellite data applications in meteorology**

**Theme:** Collaboration and the Global Campus

**Author:** Piia Post, University of Tartu, (piia.post@ut.ee)

**Co-Author(s):** Zanita Avotniece (Latvian Environment, Geology and Meteorology Centre), Izolda Marcinoniene (Lithuanian Hydrometeorological Service), Vesa Nietosvaara (EUMETSAT), Kai Rosin (Estonian Environment Agency), Izabela Zablocka (Institute of Meteorology and Water Management – National Research Institute),Teresa Zawislak (Institute of Meteorology and Water Management – National Research Institute), Barbara Zeiner (ZAMG)

**Abstract:**

The formal educational background of professionals working in weather services of Estonia, Latvia, Lithuania is very variable and often does not give good preparation for technical applications. It sets up to weather services a complicated task to organize high quality and interactive trainings for application of modern technologies used in weather monitoring and forecasting. It means that often future forecasters have not studied satellite meteorology fundamentals during their university studies. Therefore in 2014 was initiated, following the example of NOMEK, Baltic+ -- a network for advancing knowledge and skills in satellite meteorology inside meteorological services of Estonia, Latvia, Lithuania and Poland. The uneven level of learners is not the only problem, but also a lack of experienced educators. These advanced courses will be an opportunity to work out education plans in these weather services and also prepare and train local educators. Estonia, Latvia, Lithuania and Poland are fresh members of EUMETSAT and therefore the courses are sponsored by EUMETSAT.

We talk about the results and conclusions of the first course of this network that took place in Tallinn in March 2015.

**Nr:** 26 **WMO Global Campus**

**Theme:** Collaboration and the Global Campus

**Author:** Aileen Semple, WMO, (asemple@wmo.int)

**Abstract:**

There are many drivers leading to the increasing and changing training needs of National Meteorological and Hydrographic services, including expanding and new service offerings, for example in areas of DRR and climate services. There is an increasing focus and requirement for competency based training as well as changes in staffing profiles and advancements in delivery methods. Added to this, some countries are not able to educate and train their staff and for many, funding for training is static or in some cases, decreasing.

Currently, there are 27 WMO Regional Training Centres and a number of WMO affiliated institutions and among these, we have many examples of collaborative working and good networking, but despite this, a gap in demand and supply of training exists.

The WMO Global Campus concept is primarily about how we strengthen and enhance the collaborative and cooperative working in a number of areas to try and help narrow this gap and adapt for the changing landscape and associated increasing training needs.

A WMO Global Campus feasibility study has commenced and a number of themes are being looked at including, developments and delivery of courses, language translations, quality assurance and global access to training events listings.

The Calmet community has strong examples of collaborative working, so how can we build on these. During this session, there is an opportunity to update you on what's been happening but more importantly seek your thoughts and input to how the community can increase collaboration to meet the training needs.

**Nr:** 28 **Reverse engineering for instructional re-design**

**Theme:** Quality control and trainer competencies

**Author:** Maja Kuna-Parrish, EUMETSAT, (maja.kuna@eumetsat.int)

**Abstract:**

Even if it seems that you delivered your course just yesterday, you already need to start preparing for the next edition. You begin wondering how to enhance your existing course so it becomes even more effective this year. You open the course agenda, look at the course website, and randomly browse the existing content. Is there a more systemic and systematic way to start?

One way to approach this is by going through a process of disassembling and examining various components of the course, just like a software engineer might do to analyse a software programme that needs to be updated to work with a new operating system. The aim of this reverse engineering process is to extract information about how the course components work together, and to learn what components of the design function well and which one can be improved.

Many tools and templates aim to support planning and designing of a course. This session will demonstrate a tool that addresses a course re-design inspired by a reverse engineering approach.

**Nr:** 29 **Boost My Course**

**Theme:** Quality control and trainer competencies

**Author:** Vesa Nietosvaara, EUMETSAT, (vesa.nietosvaara@eumetsat.int)

**Co-Author(s):** Maja Kuna, EUMETSAT

**Abstract:**

Trainers sometimes need to plan and create a course from scratch, but even more often they need to work on developing a course that has existed already for years, even decades. It can be challenging to update our courses, which often include a lot of traditions fixed processes.

In this workshop we will apply a process for reviewing the status of our old course and renewing it where needed.

**Nr:** 30 **Using Booster Questions to Increase Recall and Retention**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Tsvetomir Ross-Lazarov, UCAR/COMET, (tlazarov@ucar.edu)

**Abstract:**

Forgetting is a natural and necessary process that enables the human brain to deal with the vast amounts of information that surround us. Unfortunately, this means that information in our training courses is part of what is forgotten. By including interactive, real-life scenarios in courses, trainers can increase the probability that the course information will be remembered, but we can help learners more. Research into the use of booster questions after the completion of a training course indicates that this strategy helps our learners recall and remember the key ideas from our courses. This interactive presentation will explore some of the research into the use of booster questions in the days and weeks after the completion of a course. It will illustrate how this strategy was used in a weather forecasting course, and will share some results concerning student engagement.

**Nr:** 31 **The Challenges and Possibilities of the Meteorological Education in Brazil**

**Theme:** Adopting new teaching strategies and innovations

**Author:** EDNALDO SANTOS, Federal Rural University of Rio de Janeiro and UNEMET, (ed.unemet@gmail.com)

**Co-Author(s):** Daniel Carlos de Menezes

Brazilian Airport Infrastructure Government Corporation (INFRAERO) and UNEMET

**Abstract:**

The main purpose of this paper is to indicate the actual situation of education (technical and higher levels) of Meteorology in Brazil and its constraints. From this, analysis of the challenges to be faced in terms of teaching will be done in our country, such as the outlook for the Education without Distances (EwD), pointing out the major bottlenecks for Meteorology groups have not yet engaged in this modality. In addition, we present a review of labor market trends from 2000 to 2014, focusing mainly on increasing the number of courses and places offered to absorb these professionals, to understand whether the guidelines set yet in teaching and learning are on track or whether should undergo necessary adjustments or changes in relation to future challenges in the area of Meteorology.

**Nr:** 32 **Tailoring of a competency-based satellite course**

**Theme:** Competency-based training and assessment

**Author:** Ivan Smiljanic, DHMZ, (ivan.smiljanic@eumetsat.int)

**Abstract:**

Being a project primarily dedicated to a training in satellite meteorology, Eumetrain project organized in a past few years many courses that were closely related to a remote sensing in meteorology. Two of these courses were organized in a well defined sequence and last time held in year 2014. These are “Basic Satellite Meteorology Course” and more advanced “Satellite Image Interpretation Course”.

Closely related to a competences derived from still developing document on a meteorological satellite enabling skills, Eumetrain is presently tailoring a new version of a “Basic Satellite Meteorology Course”. This version of a course will be interesting blend of synchronous and asynchronous online course, which will try to give an answers to analysis, diagnosis, prognosis and forecasting of processes in the atmosphere and over land, seen through the eyes of remote sensing and aligned with the skills that the meteorological forecasters need to perform. This course is foreseen to be held in year 2016 for the first time.

This short presentation will try to give an insight into the process of tailoring of this new course, and will show the transition from rather conventional approach to training in remote sensing to a competency-based training.

**Nr:** 33 **Moodle exchange demonstration project**

**Theme:** Collaboration and the Global Campus

**Author:** Mustafa ADIGUZEL , WMO, (madiguzel@wmo.int)

**Co-Author(s):** Bruce Muller , COMET

**Abstract:**

Several organizations and institutions have courses and content in Moodle. Some of these courses not available outside of internal or commercial use, and some of them are open to public. During its meeting in WMO from 1-3 December 2014 on Glocal Campus Feasibility, the CoCom of SCHOTI decided to have demonstration project on Moodle Exchange. Moodle capability will be used to share content of participating institutions. The presentation will share the outcome of this demonstration project..

**Nr:** 34 **Joint Efforts**

**Theme:** Competency-based training and assessment

**Author:** Marinés Campos, Servicio Meteorológico Nacional, (marinescampos27@gmail.com)

**Abstract:**

Challenge: How does a training department take advantage of available opportunities in the global meteorological community and transfer them into effective training ?

The importance of training in competencies is undeniable, but still there are many constraints to sort out when following the learning cycle in a real work environment. In this presentation I share my experience in producing a Training Development Plan (TDP), highlighting the influence of collaborative interrelationships in the past 2 years.

It is a great opportunity to participate in Train the Trainer Course 2015- WMO and learn how to apply the "Guidelines for Trainers" WMO N° 1114 with the support of the best facilitators. This course promotes active learning strategies that enhance competencies (WMO N°1083 and N°49). As I started building my TDP for the course, a web of resources and capabilities started forming and growing..

The goal of my TDP is to " Improve forecast competencies in Mesoscale Convective Systems (MCS) affecting southeastern South America" (SESA). It is in accordance to the needs described in the project ALERTAR. MCSs cause havoc in SESA affecting 4 countries due to the influence of the Low Level Jet (as has been documented in Salljex project (NSSL- 2002/3)). The TDP proposes a blended course directed to forecasters of different countries working together, with the guidance of experts, which consists of three stages: an online phase, an independent phase and a 3 day workshop ( face to face). It is recommended to have a follow up stage during one year to keep track of MCS events and forecast performance.

MCS conceptual model has been recently developed in the framework of Conceptual Models for Southern Hemisphere (CM4SH), which is a joint project between Centres of Excellence (CoEs) , co-funded by WMO and Eumetsat. The goal of CM4SH project is "to create resources and to increase the operational forecasters’ understanding of the weather systems with the help of CMs". This project offers the possibility to interact with experts and benefit from their experience. The long expected training material in spanish for regional application is now on its way. Other spin offs are: reinforced interactions between NWS andUniversity, and among institutions of other countries.

One of the active learning strategies chosen for this TDP is Simulation. A member of the training department had the opportunity of assisting the SIM workshop in Langen 2014 (WMO-Eumetsat) and apply it on a Test Case which was presented at Calmet online 2014. It was based on the conceptual model Zonda (Fohen in the Andes) developed in CM4SH. The feedback from Calmet has been incorporated in the new version for Congremet 2015 (Argentina). in the Trainers course we were provided with know how and resources on SIM (COMET) .

There were many more influences providing knowledge, skills and inspiration: Buenos Aires Nowcasting course 2013 (T-NOTE), Calmet 2013, Aeronautical Competency Workshop ( Buenos Aires 2014), WMO biannual report/ Vlab report and courses, and also being part of a Task Team (WMO.)

Taking advantage of opportunities is a duty. Connecting them is essential to achieve our goals and give the best possible service to the community. Will all parts come together to make this TDP a successful learning experience? Fingers crossed.

**Nr:** 35 **CALMet Online: 2014 --> 2016**

**Theme:** Collaboration and the Global Campus

**Author:** Roro Yuliana Purwanti, BMKG, (ry.purwanti@gmail.com)

**Co-Author(s):** Vesa Nietosvaara/ EUMETSAT

**Abstract:**

As a biennial conference, CALMet Online have been conducted in 2010, 2012 and 2014. Each year it has aimed at making improvements by implementing new approaches. It has become more interactive and more collaborative. The presenters have developed and applied new activities such as game-based learning, interactive tools and group-based learning. The topics and themes have been extended and developed, to demonstrate a variety of innovative online learning methods. The number of contributors and participants has increased: the recent event had participation from 6 continents. The co-chairs of CALMet Online 2014 paired in connecting the newcomers with old colleagues of the community. Training experts from both technical and administrative practices participated in the event, representing different cultures and backgrounds. Presenters have introduced new tactics in dealing with language issues, starting from translation topics in CALMet Online 2012 and continuing by conducting bilingual language sessions in 2014. The event is becoming more open to welcome different participant needs in hydro-meteorological training and education.

With this background in mind, and recognizing the need of being more collaborative in order to gain more participation in CALMet Online upcoming events, this workshop will develop the planning by reviewing the past events, reassembling them and analyzing where we will need to update and change our approaches.

**Nr:** 40 **What Determines Quality Training?**

**Theme:** Quality control and trainer competencies

**Author:** Patrick Parrish, WMO, (pparrish@wmo.int)

**Co-Author(s):** Roger Deslandes (BMTC)

Mark Higgins (EUMETSAT)

Bruce Muller (COMET)

**Abstract:**

Imagine this common situation: You are an office manager deciding whether to send one of your staff to a course that lasts 2 weeks. Attending the course means that this staff member is missing from the office for those two weeks (perhaps you need to work those shifts instead!), and you or someone else is paying for travel and living expenses for those weeks as well.

What assurances do you need that the course is worth these costs of time and money? What kinds of evidence do you want to see that the offering institution, the processes for training they use, and the courses they offer should earn your confidence that participants will learn required skills?

The same question applies to adopting a resource from another institution into your training programme (perhaps one found through a training repository), or assigning a resource to some of your staff members for independent study. What do you want to know about the resource and about the institution that created it to be comfortable borrowing the resource (even if it is free), and again, investing training time to use it?

The question of Quality is always there, but it becomes even more important when we think in terms of a Global Campus collaborating on training projects and borrowing and sharing resources more frequently. And it becomes particular important we consider training intended to help meet job competency standards. The ongoing Global Campus Feasibility Study includes an integral thread on Quality issues. Discussion of these issues at CALMet will help to provide input to the study.

This panel and audience discussion session will explore what we mean by Quality in the training context. We will hear from panel members on a variety of perspectives on the need for quality principles or standards, reflective of a variety of education and training environments, including the global one. Then we will ask the audience to share what they feel are their highest priority indicators of quality in the training they produce and use.

**Nr:** 41 **Weather Analysis Using 3D visualization application “Gloview” & Online Education Training System**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Han Sang-Un (KMA)

**Abstract:**

The Forecast Bureau of the Korea Meteorological Administration has developed a PC-based 3D weather analysis system called "Gloview" for work-site operation, research, and education. Gloview, operated based on the UM model, can overlap observation data such as from radars and satellites and conduct spacial-temporal atmospheric analysis. The system also have advantages in the 3D analysis of mesoscale weather phenomenon including thunderstorm and hail, as it can expand the vertical atmospheric layer with a high-resolution model and change the display angle and direction. If you install the PC-based Gloview program and save model and observation data with FTP, you can perform analysis you need. Gloview also provides 3D analysis on an individual's PC, once weather data can be obtained. Currently, training on Gloview is provided to university departments related to atmospheric science, to make the program widely available and advance the meteorological research.

The Forecast Bureau taps into online education system to train forecasters of KMA-affiliated organizations. If the headquarters' of KMA connects an instructor's PC and education materials to the distance learning system, forecasters in other regions are able to take a class on their PC. With the online education system, you can also make and upload video lectures and their materials, as well as trainees can provide feedback. The rate of participation and effectiveness of lecture is high, as students can voluntarily take part in training anytime and anywhere.

**Nr:** 42 **VLab experience in Education and Training for emerging Global Campus**

**Theme:** Collaboration and the Global Campus

**Author:** Eduard Podgaiskii, Russian State Hydrometeorological University, (podgaisky@gmail.com)

**Co-Author(s):** Kathy-Ann Caesar (CIMH, Barbados)

Grigory Chichasov (RTC, Russian Federation)

Luciane Veeck (WMO-CGMS VLab)

**Abstract:**

The foundations of the Global Campus were already in place in some parts of the meteorological education and training community for years. At early stage of the Global Campus concept development, VLab was recalled by relevant Steering Group members as one of the initiatives to consider. So what is there in the VLab that can be used for the new Global Campus endeavor? How discussions and findings from the Global Campus Steering Group could contribute to further development of the VLab?

Just like the Global Campus is seen as the modernized global network of the WMO Regional Training Centres and other relevant training providers, the WMO-CGMS Virtual Laboratory for Education and Training in Satellite Meteorology (VLab) has been established back in 2000 by the World Meteorological Organization (WMO) and the Coordination Group for Meteorological Satellites (CGMS) as the global network of specialized training centres in satellite meteorology, also known as Centres of Excellence (CoEs). The network’s mission is ‘to improve weather, water, climate and related environmental services by enabling WMO Members to utilize satellite data’. Over the past fifteen years of existence, the VLab has evolved to fourteen CoEs and eight satellite operators, and has demonstrated its capability to deliver global scale training and education events in satellite meteorology. The years 2010-2014 have seen more than 50 classroom and virtual training events organized on annual basis in all WMO regions and in all WMO languages plus Portuguese. These included regular online weather briefings, Event Weeks, regional training events and Virtual Round Table events.

As a global virtual entity, the VLab has also provided education and training in other areas of relevance to WMO Members. As an example, the Virtual Round Table on the implementation of the aeronautical meteorological competencies offered in 2013 in 5 languages was highly successful, with participants using 212 connections from 87 countries worldwide.

There are certain cornerstones the VLab bases its sustainability upon: a dedicated technical support officer, funded from the WMO Trust fund, coordinates the network and runs the online calendar of training events provided by CoEs; VLab management group (VLMG) meets online at least twice a year and holds face-to-face meetings every two years. The group comes up with recommendations and action lists for its members for the inter-session period, develops and revises basic VLab documents such as its strategy, expectations from CoEs and supporting satellite operators, recommendations for organising and running training events, provision of certificates, etc. The success of the VLab model of education and training relies on the commitment of all partners, cooperation in the virtual environment, and collaboration in developing, delivering and sharing training resources.

**Nr:** 43 **Strategies to improve learner retention**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Brad Snyder, Meteorological Service of Canada, (brad.snyder@ec.gc.ca)

**Co-Author(s):** Tsvetomir Ross-Lazarov, COMET

**Abstract:**

When it comes to classroom or remote learning courses, it is fair to say that many National Meteorological and Hydrological Services do not go beyond (Kirkpatrick Level 1) *reaction*, in terms of evaluation. Somehow Level 2 evaluation, *learning*, is elusive. Given the significant investment that is required for these sorts of training events, more accountability is being demanded by managers; this includes greater attention to learning.

An interactive session is proposed to discuss approaches to enhancing learner retention. In concert with the presentation by Tsvetomir Ross-Lazarov, we propose to have attendees:

-brainstorm best practices for follow-up approaches to residence or virtual courses

- come with courses they plan to offer and practice writing booster questions (as per Tsvet’s suggestion)

-do follow-up exercises after the CALMet workshop to demonstrate practical application to enhancing learner retention.

**Nr:** 44 **Update on MetEd's Tools and Content**

**Theme:** Adopting new teaching strategies and innovations

**Author:** Bruce Muller, UCAR/COMET, (bmuller@ucar.edu)

**Abstract:**

Quick update on new features and plans for the MetEd website with highlights of some of the latest publications.

**Nr:** 45 **Moodle Course on Moodle**

**Theme:** Collaboration and the Global Campus

**Author:** Mustafa Adiguzel (WMO), Ian Mills (EUMETSAT), Ivan Smiljanic (DHMZ), Maja Kuna (EUMETSAT), Patrick Parrish (WMO

**Abstract:**

An online Moodle Course is being developed in collaboration between EUMETSAT, EUMeTrain, WMO ETR, VLab, IMGW-PIB, EUMETCAL and MeteoFrance.

This Moodle Course, designed for teachers in meteorology, hydrology and related sciences, is about using Moodle in course delivery and it is itself delivered through Moodle. It is primarily designed to be self-directed, with a modular structure, which means that learners can access it at any time and follow it in order they wish. The edition of the course foreseen is divided in six units. Each of the units explores a different training competency area, like providing resources, communication, practice, and assessment.

We have just released the pilot version of Unit 2, related to “Providing learning resources”. Unit 3 about “Providing opportunities for dialogue and reflection” is coming up soon. We will demonstrate what has been developed so far and discuss the concept behind.

* **Competency-based** (as opposed to functionality-based)
* **Examples and practice focused on topics common for our community** (meteorology, hydrology, training)
* **Quizzes providing formative assessment** (which are leading to an achievement of a badge, and eventually a certificate)
* **Online, self-directed and modular delivery** (accessible anytime and anywhere, free navigation)
* **Reusable and adaptable** (using common technology – Moodle and easy to adapt schemes allows the course to be shared, expanded, translated or delivered with a different approach, for example tutored)

We will be happy to meet future learners and collaborators.