ONLINE TRAINING IN WASP FOR WIND ENERGY PROFESSIONALS

Merete Badger, Jake Badger, Jacob Berg, Ferhat Bingöl, Tom Cronin, Sven-Erik Gryning, Brian O. Hansen, Hans E. Jørgensen, Ioanna Karagali, Mark C. Kelly, Søren E. Larsen, Niels G. Mortensen, Rikke Nielsen, Alfredo Peña, Ole Rathmann[1]

Technical University of Denmark
Roskilde, Denmark

Anita Monty[2]

Expect Learning
Copenhagen, Denmark

INTRODUCTION

An online course in wind energy resource assessment has been developed by the Technical University of Denmark (DTU). The course builds upon a successful physical course, which the Department of Wind Energy at DTU has offered to the wind energy industry for more than 20 years. The course objectives are:

1. To teach participants to use the Wind Atlas Analysis and Application Program (WAsP)

2. To provide participants with enough theory about wind power meteorology to avoid the major pitfalls related to wind resource assessment.
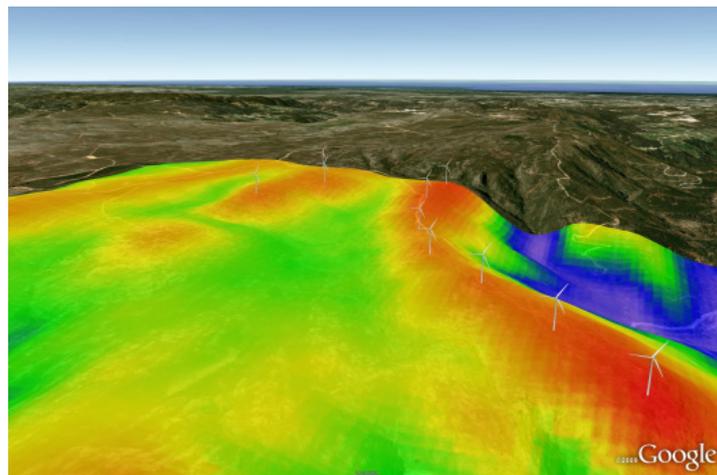

Figure 1. Map of the annual wind power production over a hilly site produced with WAsP

WAsP is the wind power industry-standard PC-software for wind resource assessment and siting of wind turbines and wind farms, with more than 4,000 licenses sold in more than 100 countries.

---

[1] Department of Wind Energy, Frederiksborgvej 399, 4000 Roskilde, Denmark, E-mail mebc@dtu.dk
[2] Gothersgade 11, 1123 København K, Denmark

COURSE DESIGN

The course design is based on a research based scaffolding model for building up communication and active participation for learners online [1]. Fellow participants and the teachers support the learner's cognition and their critical reflection as they go through structured online activities called 'E-tivities' together. As the course progresses, participants become more independent and responsible for their own learning.
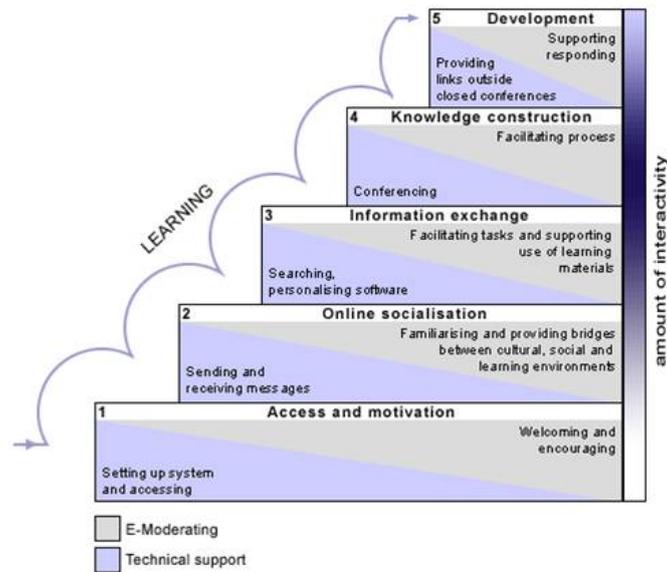

Figure 2. The five-stage scaffolding model used to design the WAsP course. Source: Salmon, G. (2011). E-moderating. The key to teaching and learning online. 3rd Ed. Routledge: London and New York.

COURSE STRUCTURE

The WAsP course is designed to run over 10 weeks. A new course module opens every week and participants have the flexibility to work any time during that week.

A module contains 3-4 E-lessons with different learning elements:

- PowerPoint presentations with speech
- Hands-on exercises
- Screen demonstrations
- Group discussions
- Self-tests

E-MODERATING

The course teachers act as E-moderators. They facilitate the group discussions, answer questions, and motivate the participants.
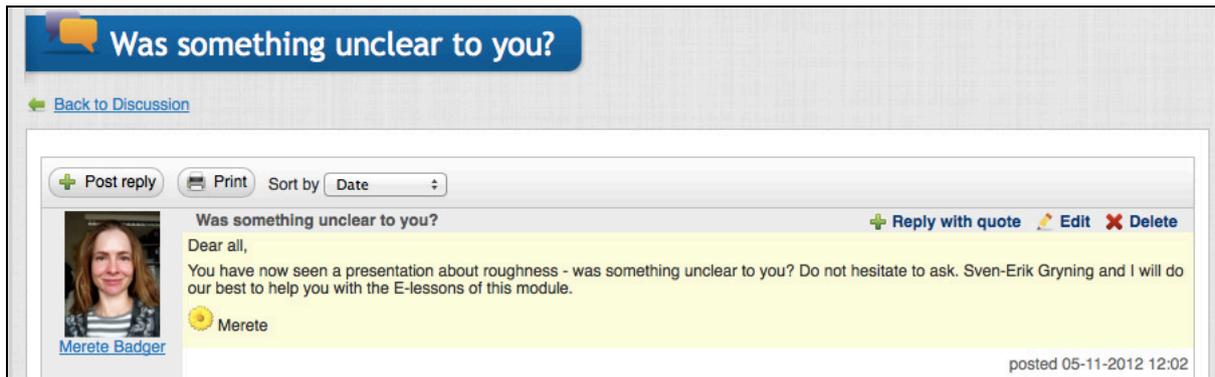
Figure 3. Example of an E-moderator note posted in a forum for group discussion. Learning platform: itslearning.

The frequent contact between participants and teachers is very important for achieving a high completion rate on the course. The aim is that all participants complete the course and receive a course diploma.

TESTING THE COURSE

The course has been tested twice. Internal testing took place in the autumn of 2012 with 12 participants from DTU Wind Energy. The participant feedback was generally positive and all participants completed the course. A few issues were pointed out by participants and improved before the second test:

- The audio quality of recorded presentations was improved

- Screen demonstrations were made for all hands-on exercises to show the solution step-by-step

- The estimated work load per module was adjusted to better match the actual work load reported by the test persons

A second test with external participants took place in the Spring of 2013. For this test, 24 participants from the wind energy industry and from four technical universities were invited to follow the course at no cost. The participants were located in many different countries around the world and had very diverse scientific and cultural backgrounds. Of the 24 participants, 20 completed the course and received a course diploma. The participant's feedback was again very positive:

Course participant from Brazil:
"WAsP online course is a great idea and a great opportunity for all users that don't have the chance to travel. Congratulations for the initiative."

Course participant from Spain:
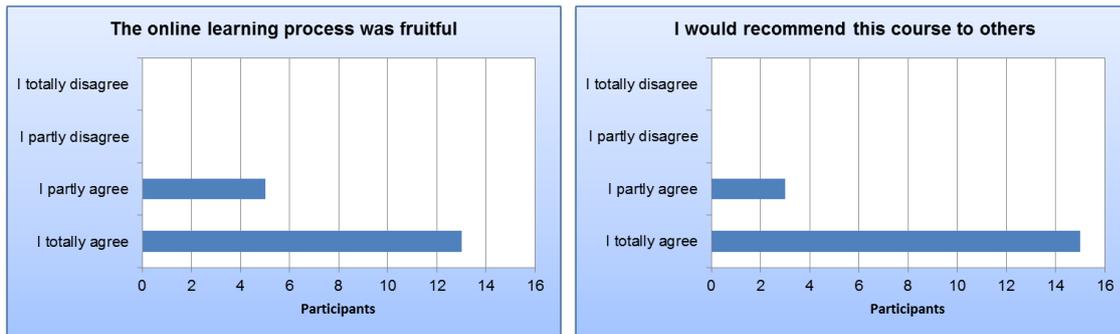*"I want to say that all e-moderators and participants have been very active. It was easy to learn!!!"*

Figure 4. Examples of participant feedback from the first test of the WAsP online course

THE NEXT STEPS

The development and test phase of the WAsP online course has now ended. The next steps for the project team behind the course will be:

1. Offering the course commercially:
   The course is ready to be offered to the wind energy industry. The first commercial run will be launched in early September, 2013. See www.wasp.dk for advertisement regarding this course.

2. Integration with university programs and courses:
   The online course material is likely to be incorporated in courses at DTU Wind Energy and also in joint educational programs.

3. Connection to the Virtual Campus Hub:
   Connection of the WAsP course environment to a portal called Virtual Campus Hub is in progress. From the portal, users will be able to access applications offered by different universities with the user name and password of their local university. This simplifies collaboration across borders, e.g. in joint educational programs, and takes advantage of high-speed European E-infrastructures.

ACKNOWLEDGEMENTS

REFERENCES

[1]   Salmon, G. (2011). E-moderating. The key to teaching and learning online. 3rd Ed. Routledge: London and New York.