Train the Trainer:
Best Practice Guide

(Key Ideas from the CASTIEL Train the Trainer Workshop on 16 December 2021)

Train the Trainer Concept

- Trainers are individuals, so are their areas of expertise, skills, competences, needs.
- Train the Trainer (TtT) is not as trivial as it may appear at first sight – best qualification = dedication to teach
- Teaching HPC is fun:
  - Enabled many national & international collaborations
  - Freedom to choose which parts to teach
  - Usually the classic academic career path does not focus on teaching or quality of teaching
- Minimize frustration: Many no-shows if there isn't any course fee
  - Costs nothing = association that "not worth anything"
  - Costs something = minimize frustration
  - Always better if courses/training-events have a price-tag attached; if something is free, it is regarded without impact
- Additional mentoring can happen on simple things, for example agenda management

AN EXAMPLE OF THE TtT MODEL
- Shadowing: Follow the senior trainer as a training assistant, master training material, get professional feedback and best practice hints
- Pairing: Two new trainers try to divide the existing material and to assist each other
- Asymmetric approach: Trainer + assistant(s) during the exercises

SKILLS FOR TRAINERS
- Basic pedagogical training: learning models – e-learning tools, new techniques in collaboration tools (i.e. with academic institutions), vocational teacher training. (For such skills, the local university may provide the needed courses.)
- A quality trainer requires a multidimensional skillset
- Interactive skills, essentially speaking and communication skills
- Individual practicing, coaching, feedback from professional communications trainer, colleagues and participants

Becoming a Good Trainer – Key Ideas

- Sharing own area of expertise in an interesting yet motivating way
- Training goals: Transmit specific skills and knowledge
- Targeting the audience:
  - Discriminate different audience and expectations: Industry/University/graduate student
  - Convey the message with motivating and inspiring content, using different means and tools available.
- Plan/Revise the training from exploring feedback received from the audience.

Resources for Trainers

PRACE TRAINING CENTERS
- Serve as European hubs and key drivers of advanced high-quality training for researchers working in the HPC/HPDA/AI
- PRACE Training Centre Events: https://www.events.prace-ri.eu/category/2/

THE NETWORK OF HLRS COURSES – TRAIN THE TRAINER PROGRAM (TtT)
- Teaching new trainers
- Providing the whole course material to them plus maintaining up-to-date revisions. However, teaching with other people's slides is not easy
- The new trainers can freely choose; which parts they want to use for their courses
- Next possibilities for TtT:
  In principle all MPI&OpenMP courses in https://www.hlrs.de/training
- For the rules, please look at https://www.hlrs.de/training/2021/PAR & https://www.hlrs.de/training/2021/TtT, just get in contact with rabenseifner@hlrs.de

NVIDIA DLI
- The NVIDIA Deep Learning Institute (DLI) offers hands-on training for developers, data scientists, and researchers looking to solve challenging problems with deep learning – https://www.nvidia.com/en-us/training/.
- All instructors are NVIDIA certified University Ambassadors.
- Full day courses contain an assessment part to earn a student certificate
- Courses are free to academia if offered by certified University Ambassadors (instructor led).
- If the target audience was industrial, course fees would apply and a minimum amount of 2000 USD would have to go to NVIDIA.
- The DLI provided instructor-level course material is quite useful.
- Topics:
  - Fundamentals of Deep Learning
  - Fundamentals of Deep Learning for Multi-GPUs
  - Building Transformer-Based Natural Language Processing Applications
  - Fundamentals of Accelerated Computing with CUDA C/C++
  - Accelerating CUDA C++ Applications with Multiple GPUs
  - Fundamentals of Accelerated Computing with OpenACC

Accessibility Create accessible high quality learning material for HPC	**Community** Create/enlarge your international HPC community
New skills Learn and develop new communication and didactic skills	**Feedback** Improve your learning material from receiving focused evaluations of a large-student base
Share knowledge Share your knowledge and experience with a much larger HPC community	**Visibility** Increase the visibility of yourself and your institution in the HPC community

WHAT SHOULD YOU KNOW BEFORE STARTING A MOOC?

- Time:
    - A lot of time for preparation: 7 – 12 months
    - Requires different forms of interactivity
    - Interaction during the course: 3–5 weeks avg 4–5 h/week
    - Maintenance of the material
- Money:
    - Production costs quite high (5,000 – 20,000 EUR)
    - Video recording
    - Graphic material and copyright materials
- Motivation
- Requirement:
    - Review your didactic approach
    - Learn new skills (video, podcasts)
    - Use of motivational didactic material

PRACE MOOCs:

- Reach Fortran for scientific computing:
- First run, 440+ participants
- https://www.futurelearn.com/courses/fortran-for-scientific-computing