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# Scaling-up professional development: Chances and challenges

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**Educating the Educators, *Essen 2014, Germany***

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## The situation in 2004 (e.g., Math)

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Plenary-Presentation at ICME (2004) –

Analysis of papers on mathematics teacher education in leading Journals and Proceedings (1998-2003) by Adler et al. (2005, ESM):

- *Small-scale qualitative research predominates*: More than two thirds of studies with an empirical claim had less than N=20 (participants being in the focus of research)
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Adler et al. (2005):

- *“We know little about what happens when programmes spread to multiple sites. We have also done less of studying what it means to scale up or what it means to extend a program that has worked in one setting to another setting – what works, what goes wrong, what do designers need to know and think about.”*
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Another claim by Adler et al. (2005):

- *Most teacher education research is conducted by teacher educators studying the teachers with whom they are working*
  - 90% of JMTE articles, 82% of PME and 72% of JRME articles were of this type.
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Adler et al. (2005):

- *“A person [team] designs a program and one wants to show that it works. It is not so surprising that research aimed at showing effectiveness of particular approaches predominate. This is how innovative ideas are shared, substantiated, and thus gain currency.”*

→ „Emerging field“! [Need for large-scale research!](#)

→ **2014** „Educating the Educators“, **2015** ZDM Special Issue

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# Content

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- WHAT does scaling-up (with multipliers) mean?
  - WHY is scaling-up (NOW) so important (popular)?
  - Scaling-up as „knowledge transfer“? Three approaches
  - Some remarks on sustainability
  - Experiences from PFL and IMST
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# WHAT does scaling-up (with multipliers) mean?

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1 TE → 20 → 400 → 8000 ... Multipliers

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Supported by **Professional Learning Communities & E-learning Communities** (Maaß and Artigue, 2013)

Or: Building on Schools & Lesson and Learning Study etc.

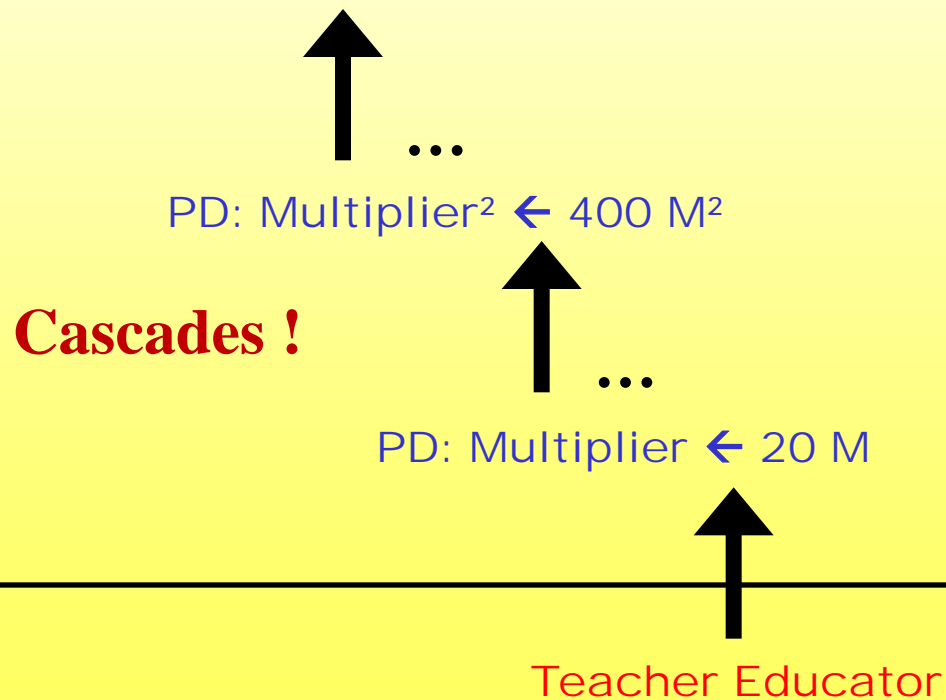
Easy idea with **chances**, but also **many challenges** !

→ **Why is it so sparkling to be a Multiplier ?**

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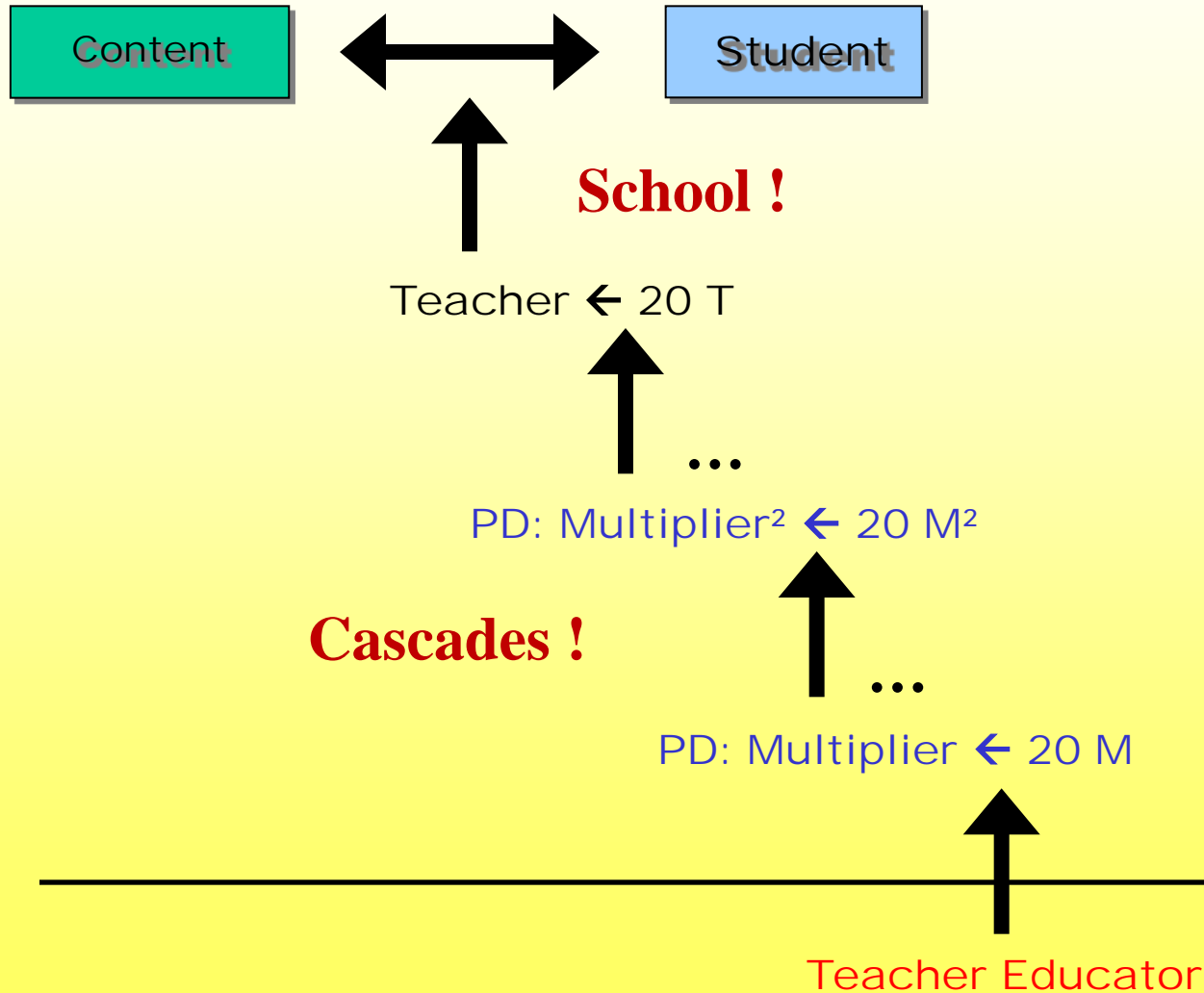
# Large-scale PD design and research

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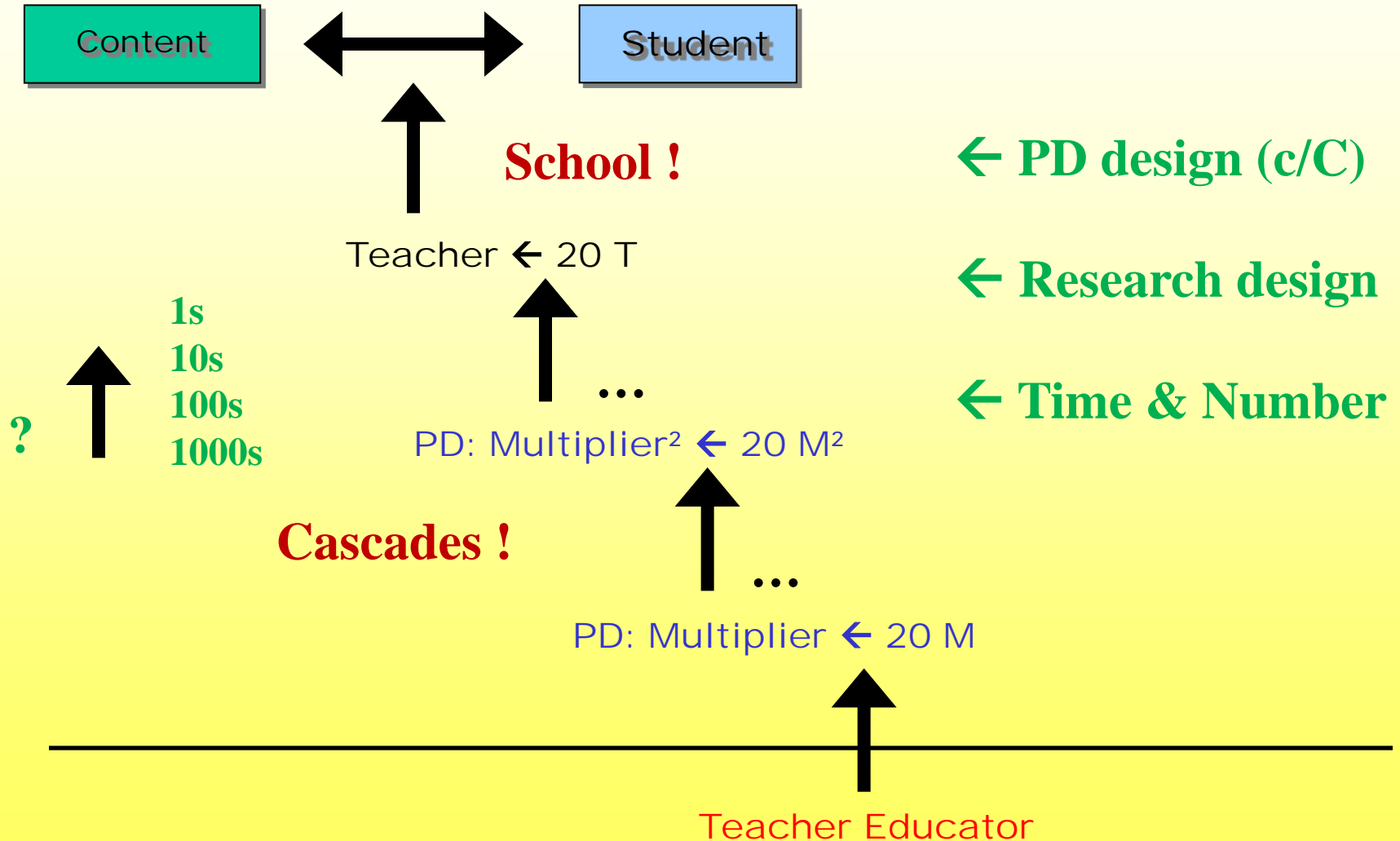




# Large-scale PD design and research



# Large-scale PD design and research



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## Number of Classrooms/Teachers

### ***Levels Classrooms/Teachers***

Micro 1s <-> Students, Parents, Ms

Meso 10s <-> (Math) Leaders, Ms

Macro 100s <-> District Leaders, Ms

Macro<sup>2</sup> 1000s <-> Policy makers, Ms

### ***Focus***

Individuals, Teams

Networks, Schools

Districts, Regions

States, Nations

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## WHY is scaling-up (NOW) so important (popular)?

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- Scaling-up PD means **resources from many people** (time, money, ...), therefore good reasons are needed
  - Problematique: Reaction to a situation that needs a change; e.g., improvement of **teaching**, often based on bad results in (international) **studies on student achievement**
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- Why not other measures than PD?
  - Teachers are the key group
  - Pre-service teacher education: long time to be implemented, to get the first graduates, to measure, analyse & publish the impact of their teaching (with impact on student achievement)

→ PD seems to be direct and quick, and easy to scale-up

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# Scaling-up as “knowledge transfer”?

## Three approaches

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- **Naive rationality**
  - Only teachers have to change
  - Need for (some) professional development
- **Technical rationality** (Schön, 1983; e.g., Altrichter et al., 2008)
  - Experts outside practice analyse the situation (Adm-R)
  - They define problems and solutions (outside practice)
  - Practitioners have (only) to “apply” (to implement, to put into practice, ...)

**Support/Resistance? Role/identity of multipliers?!**

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## A third approach

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- **Reflective rationality** (e.g., Altrichter et al., 2008)
    - Complex practical problems require particular solutions
    - These solutions can only be developed inside the context in which the problem arises and in which the practitioner is a crucial and determining element  
[support by researchers !]
    - The solutions can only rarely be successfully applied to other contexts, but they can be made accessible to other practitioners as hypotheses to be tested in practice
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## Some remarks on Sustainability

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- Hargreaves & Fink (2003): Sustainable improvement requires investment in **building long-term capacity for improvement** → e.g. **teachers' skills**, which will stay with them forever, long after the project money has gone
  - Fullan (2006): **To build trust ... long-term effects!**  
Otherwise: „win the battle, [but] loose the war“  
**Relationship researchers-teachers-administrators!**
  - (Zehetmeier, Dissertation 2008, Habilitation 2014+)
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## Three aspects ( 3 Co's) to consider when aiming at sustainable scaling-up

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- **Content** (general – very specific)
- **Community** (individuals – team – community – institution; teacher – multiplier)
- **Context** (district – state – nation)

**IBL for all (attitude): teachers, multipliers, researchers, educational administration and policy**

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# Experiences from PFL and IMST

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## Austrian background

- **1982: PFL** = Pedagogy and subject didactics for teachers; two-year PD courses for secondary teachers; reaction to lack of subject-didactics (experts) in teacher education; co-ordinated by (later) IUS
  - **1984:** About 100 T finished PFL; **1985:** new courses
  - **2014: About 1000 T finished** (40 ECTS; all school levels, since 2012 focus on competence-oriented teaching)
  - PFL as an exception of the (PD) rule in Austria
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## PFL Experiences

- Excellent evaluations; Continuous adaptation of design
  - Many teachers became visible innovators
  - Some teachers got roles in teacher education (pre- and inservice), positions in educational management
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- Contribution to scientific community (1985, 1996, and 2009 books; case studies by T/TE, later also large-scale research)

**BUT** (realized by the end of 80-ies):

- Although many teachers improved their teaching, **little impact on other teachers & school development**
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Reaction, based on the assumption that a **link between PD and school development** is needed (years later: Book „Subject-based school development“, edited by Rauch & Kreis)

- Integrating reflection on the challenge of spreading innovations into PFL
  - Integrating reflection on school development
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- Team members attended a two-year-course in organisational development (and multiplied it)
  - Pilot-projects with schools or parts (e.g., all M teachers)
  - Offering an extension from PFL to ProFiL (School Development), M.Ed with 120 ECTS
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**Experiences:** Relative success, some „shining examples“  
(insights für design and research, also implications for PD)

**BUT** (realized by the end of 90-ies):

- Little impact on other schools, ..., national level  
→ PD fosters instructional development, but needs a **link to school development**, AND also to **regional/national efforts !**

**GOOD LUCK**

- Bad TIMSS results (1995) → **Analysis** by IUS & Partners
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# PFL and DZLM design principles

(e.g., Krainer & Posch, 1996; DZLM, 2013)

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- Starting from teachers' experiences and questions; participant-orientation; case-relatedness (ideas based on practical experiences and specific student results)
  - Teacher as researcher (action and reflection); fostering (self-)reflection
  - Teachers and mentors as a „learning community“ (autonomy and networking); IBL for all; stimulating cooperation
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- Teachers take responsibility for their learning; participant-orientation
  - Teachers learn to act as facilitators at their schools etc.; case-relatedness (practical experiences as PD providers)
  - Competence-orientation (since 2012)
  - Integration of pedagogy and subject didactics (interdisciplinarity)
  - Various instruction formats
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# IMST – Innovations in Mathematics and Science Teaching now: Innovations Make Schools Top

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1999/2000: **IMST** research project (analysing status quo)

2000-2004: IMST as Austrian-wide project supporting secondary schools (STEM / MINT), plus proposing **7 measures** in order **to improve MINT teaching** nationwide

2004-2015: IMST continued (since 2007 all school levels, German language), about 7.000 teachers involved; helping to establish regional and national centres and networks; **linked with PFL** („multipliers“); **PFL → IMST → PFL → ...**

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## Impact, Spin Offs & Human resources

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7 Measures (2003 → Ministry); local, regional, national

- **Multiplier- & interface structures** (M1, M2)
- **Qualification- & research structures** (M3, M5)
- **Support structures for practice** (M6, u.a.)
- **Network structures** (M4, M7)

Integrated: evaluation & research, gender & diversity

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## Multiplier- & interface structures

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- **Subject-related middle management**
  - Local: M1?; regional: M2/Univ-Course fBM?!
  - PFL!
  - **Human resources:** Qualifying multipliers in subjects didactics; teachers as disseminators of innovations; making link between Practice-Administration-Research stronger; PD as learning for teacher educators („Hochschuldidaktik“)
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## Qualification- & research structures

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- **Academic basis** (e.g., educating multipliers)
  - Establishing national & regional (Subject didactics-) Centres: 6 AECC – Austrian Educational Competence Centres & about 20 regional Centres (!?); 13 awarded as RECC (2014)
  - Austrian Society for Subject Didactics (ÖGFD)
  - **Human resources:** New positions in subject didactics (Profs, Assoc.Profs, Docs, ...)
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## Support structure for practice

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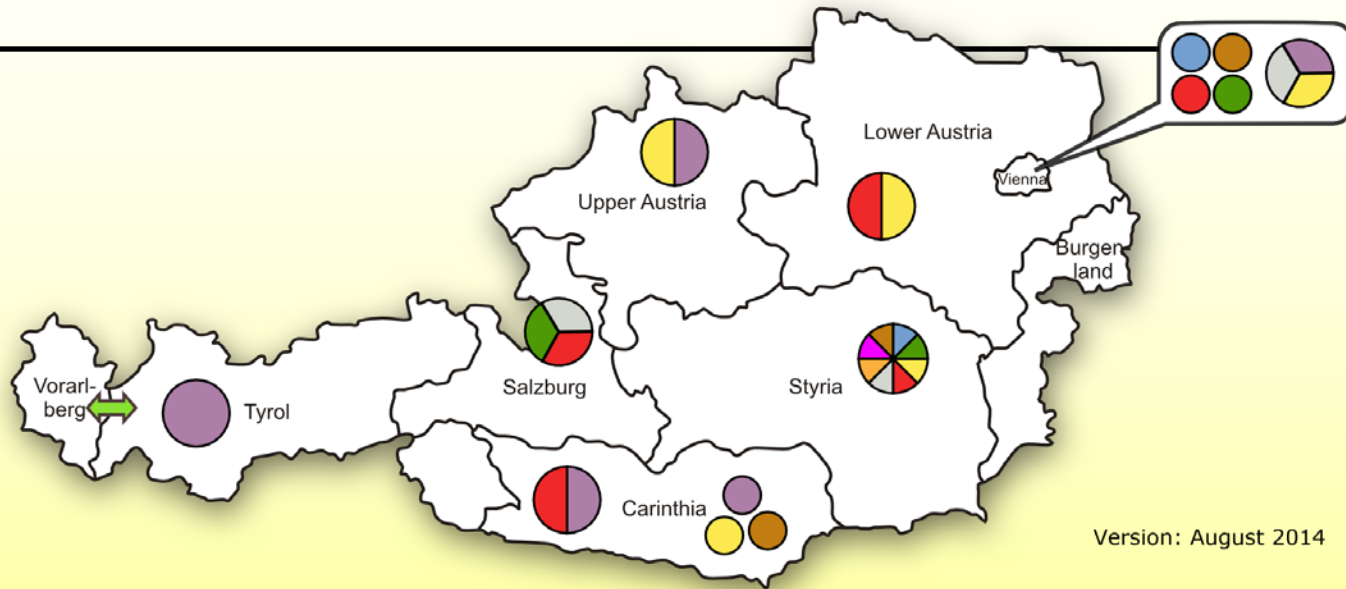
- Supporting projects (application-review-facilitation-paper; 100-200 projects/year !?):  
**thematic deepness**
  - Spreading „good practice“ ([www.imst.ac.at](http://www.imst.ac.at))
  - **Human resources:** Teachers as disseminators of innovations; prospective multipliers
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## Network structures

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- Dissemination of innovations, getting motivated for innovations: **broadness**
  - **Regional Networks** in all 9 federal states, 1 Gender\_Diversity Network; 2 Austria-wide meetings a year (!?)
  - **Human resources**: Making regional multipliers stronger by interdisciplinary exchange of experiences & networking with research & educational administration
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# Regional and national Centres









## Regional Didactics Centres

-  Geometry
-  Mathematics
-  Language & Cultures
-  Geography
-  Physics
-  Science
-  Informatics
-  Chemistry
-  Biology

 Regional Network Vorarlberg & PH  
Vorarlberg collaborates with RDFZ Tyrol

## Austrian Educational Competence Centres (AECC)

-  German Language
-  Mathematics
-  Physics
-  Chemistry
-  Biology
-  Instructional and School Development



## A message from ministry to schools

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- Please, focus on (students') inquiry-based learning
- Please, continuously reflect and improve your practice
- Please, change experiences with colleagues and experts
- Please, try your best in embedding new research results

**WE TRY IBL OURSELVES AND SUPPORT YOU!**