Innovations in Teacher Development for the Knowledge Age

Mary Lamon

Institute for Knowledge Innovation and Technology
Ontario Institute for Studies in Education
University of Toronto

IKIT

UNESCO's Global Strategy in the Use of ICTs in Education

The strategy focuses on the following main goals:

- Ensure wider access to and equal opportunities for quality education for everyone at all levels
- Harness the potential of ICTs for building sustainable, equitable and inclusive knowledge societies and for reducing the digital divide;
- Develop, collect, disseminate and share policy guidelines, models of good practice and resources aimed at enhancing the quality, cost-effectiveness and efficiency of ICT use in education.

UNESCO's Educational Policies and Priorities in E-learning for Teacher Development

Book:

Teacher Development in an E-Learning Age: A Policy and Planning Guide

(UNESCO authors: Anderson, Bates, Breuleux, Khvilonn, Laferriere, Lamon, Patru, Resta, Rumble)

UNESCO: Education for All - 2015

Challenges for teacher development

- The quantitative demand
- The qualitative demand

The Quantitative Challenge: Global Teacher Shortages and Teacher Education

- The “Education for All” Global Monitoring Report 2002 estimates that a minimum of 15 to 35 million teachers will be required by 2015 (may be an underestimate based on the ravages of HIV/AIDS)
- Two-thirds of the world’s 60 million teachers live and work in developing countries
- Teaching is no longer viewed as an attractive profession
- Critical need to invest in teacher education

The Qualitative Challenge: Education for the Knowledge Society

- Knowledge has become a principle force in social transformation
- Leaders of virtually all countries have professed their desire to transform their countries into learning economies and knowledge societies
- Reciprocal relationship between technological and social innovations
- Teaching for 21st century skills

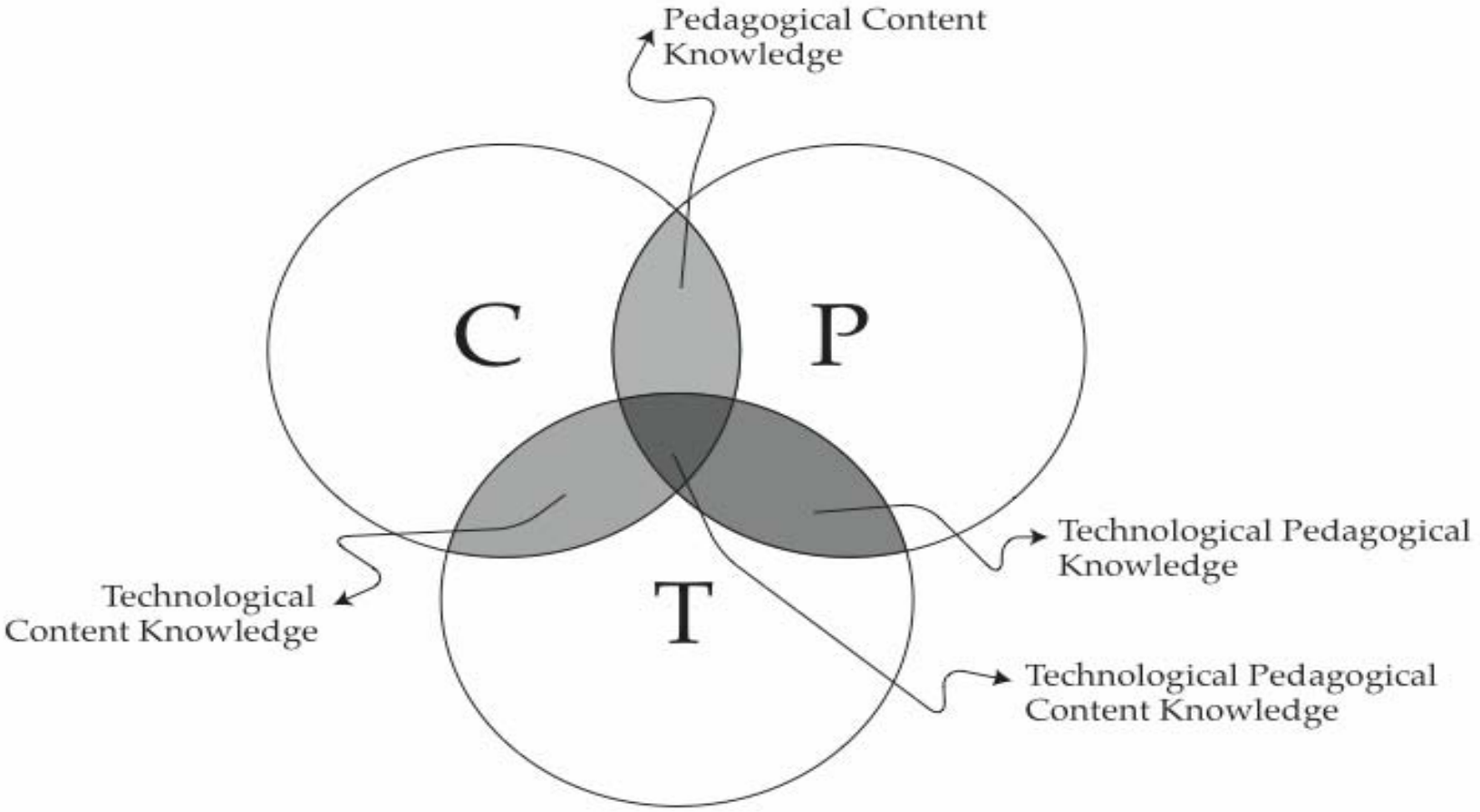
Research: e-learning as a solution for long standing problems

- Improving teachers' domain-specific knowledge through new tools
  - Online materials (Fisher, 2003)
  - Web-based portals (Linn et al, 2004)
  - Simulations (e.g., Nunes et al., Sao Paulo)
  - Telementors (e.g., O'Neill et al, 2003)
  - Video cases of exemplary practices (e.g.,http://ikit.org/mvt)
  - Interactive WWW technologies (e.g., collaborative blogs, Wikis)

Research: e-learning as a solution for new problems

- Innovation in teacher education to prepare teachers to design creative curriculum for teaching students 21st century knowledge and skills (e.g., collaboration, team work, creative problem solving, leadership, high levels of literacy, working with knowledge)

- Integration of pedagogical content knowledge and technology

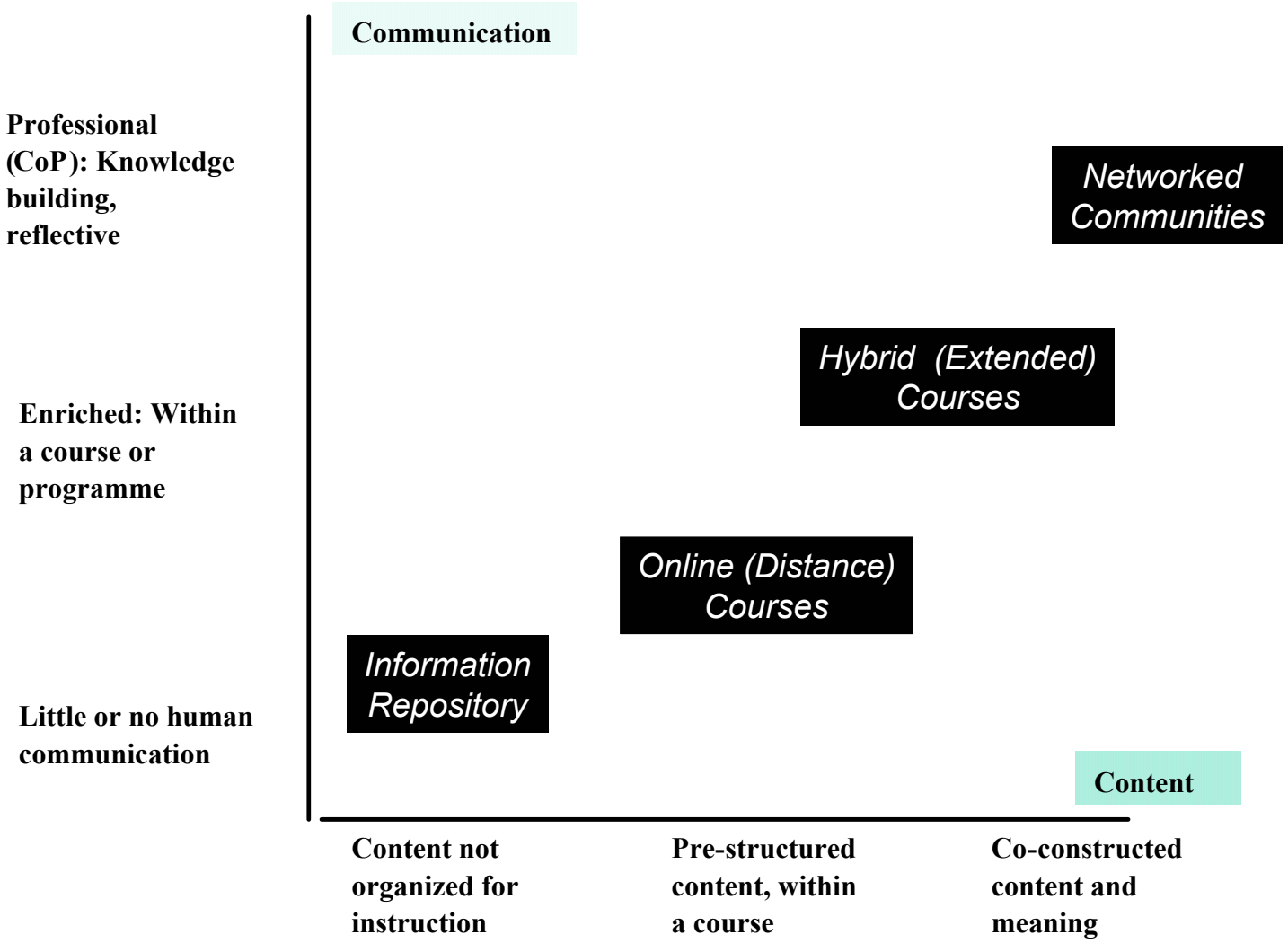

Pedagogical Content Knowledge
C
P
T
Technological Content Knowledge
Technological Pedagogical Knowledge
Technological Pedagogical Content Knowledge

Essential Conditions for E-Learning in Teacher Development

- Shared Vision (stakeholders)
- Access (MIT - computer)
- Skilled Teacher Educators (model new approaches for learning)
- Professional Development (lifelong learning)
- Technical Support (ongoing)
- Content Standards and Curriculum Resources (explosion of information - teacher not the main source)
- Teaching for Deep Understanding (new approach for teaching and learning)
- Assessment (formative and summative)
- Support Policies (time, incentives)

Our Approach

- Ecological approach to the study of change: The concept of information ecology as "a system of people, practices, technologies, and values in a local environment" (Nardi & O'Day, 1999, p. 49)
- Pioneers' and early adopters (Rogers, 1995)
- Research results (multiple teaching approaches and research methodologies for the seven continents)


Communication
Professional (CoP): Knowledge building, reflective
Networked Communities
Hybrid (Extended) Courses
Enriched: Within a course or programme
Online (Distance) Courses
Information Repository
Little or no human communication
Content
Content not organized for instruction
Pre-structured content, within a course
Co-constructed content and meaning

Information Repositories

- Quick development
- Inter-changeability
- Individualized learning

Concerns

- Access to high quality, culturally relevant content
- Not used even by those who create them

Online courses

- Participate in the course using the Internet and the Web
- Content pre-structured by the teacher
- Some communication with the teacher
- Communication with peers via e-mail or other communication tools that may be embedded within the Web environment
- Content Management Systems

What is a Hybrid Learning Environment?

- Students use online resources and tools and also meet face-to-face on campus as members of the same class or program
- The Web has become the technology of choice
  - Electronic versions of lectures, handouts, learning assignments, exemplars and/or artifacts, links to supplemental learning resources
  - Tools for collaboration, discussion, and joint problem solving

Why Is Hybrid Learning Important?

- Time
  - Flexibility, savings, convenience
  - Extended opportunities for engagement
- Twenty-first century skills
  - Exchanging real-time data
  - Deliberating alternative interpretations
  - Using collaborative tools for progressive problem solving
- Emphases from learning sciences on
  - Learners and learning
  - Knowledge
  - Assessment
  - Community

How Hybrid Learning Environments Work

- The integration of domain-specific knowledge and pedagogy with technology
- The transformation of pre-service teachers' beliefs about learning and teaching
- The conduct of learning in real-world contexts

The Web-supported teacher educator's classroom

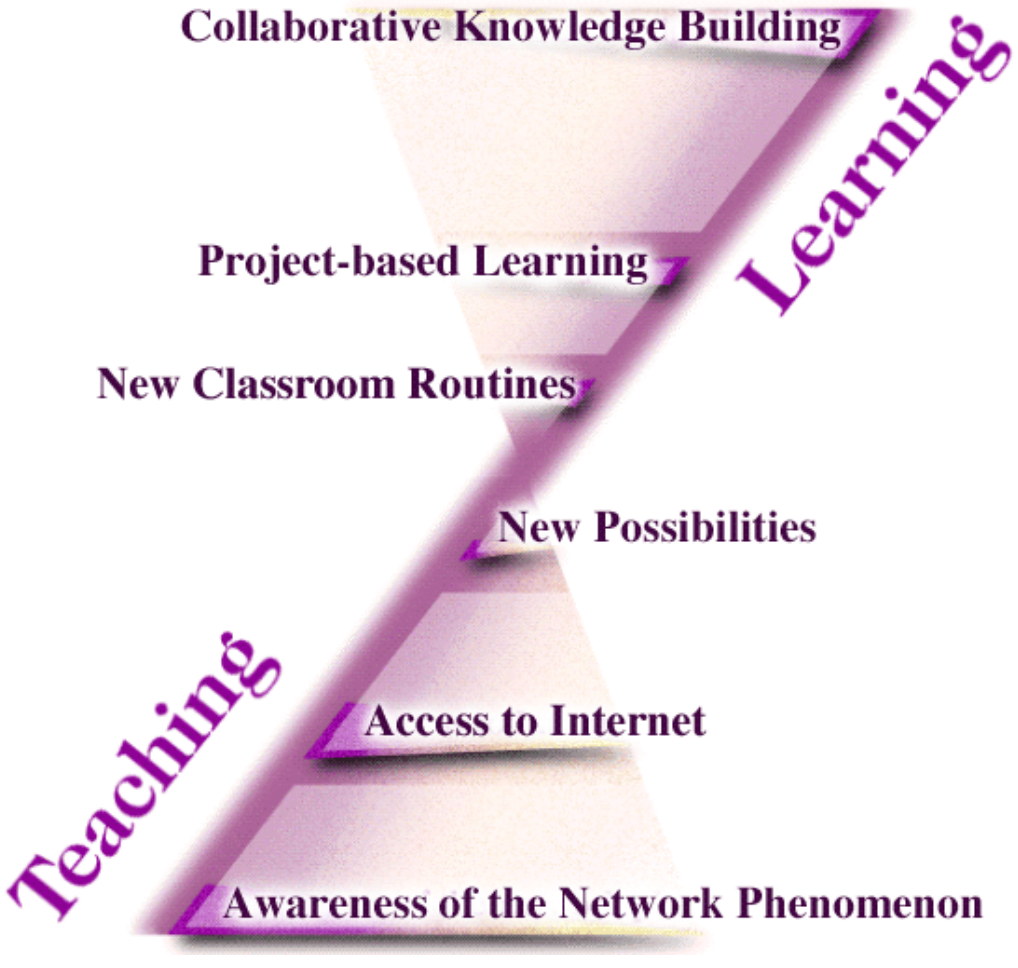
- Learning materials put online are dynamic
- Learning contexts are linked
- Discourse extends beyond the walls of the classroom
- Teacher educators uncover the potentials and challenges of pre-service teachers interacting online for reflection purposes
- Teacher learners become online contributors to school learners' and to their peers' learning

Requirements

- Network Access
- Visioning and resource allocation
- Faculty Awareness and Support
- Student Recruitment
- Retention and learner satisfaction

Teacher Networked Communities

- Webs of relationships growing from computer-mediated conversations
- A group united by a shared sense of purpose, concerns
- Teachers who share a common connection
  (e.g., teachers working in the same school or district)
- Teachers who differ in certain ways
  (e.g., teachers in different geographical locations)



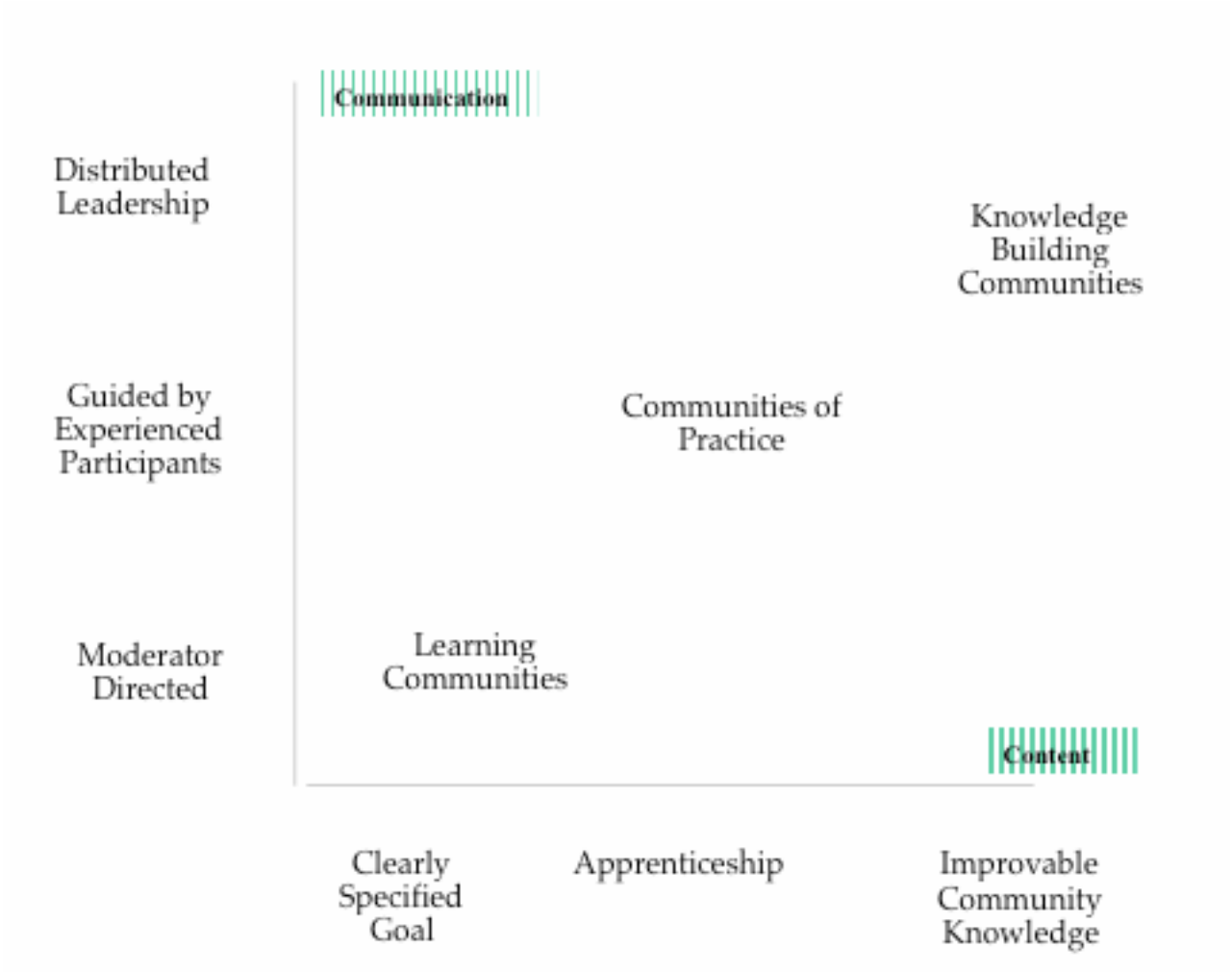
Stages in teachers' adoption of ICT (Laferriere et al, 1997)

Characteristics

Characteristics	Formal	Non-formal	Informal
Organization	Universities/normal schools	School/District/ Professional association based	School/District / Professional association/interest based
Goal	Accreditation	Learning specific content or strategies	Becoming a member of a community of practice
Content	Mainly structured curricula	Negotiated	Constructed meaning through dialogue and shared activities
Structure	Course/program completion	Completion of the specified goal	Sustained participation as a manifestation of interest
Access	Local and national standards	Curricular and pedagogical resources	Teaching communities and their shared repertoire of resources
Knowledge	Declarative Knowledge – knowing that	Knowing that and knowing how	Tacit Knowledge – knowing how
Leadership	Course instructor	Moderator probably pre-ordained	Guidance based on experience
Timeline	Course/program	Limited	Potentially ongoing
Community	Class/course	Learning community	Community of practice

Informal and Non-formal Teacher Networks

- To support teacher development for 21st century skills
- To improve teacher learning
  (from transmission to socio-constructivist approaches)
- To share experiences, resources, teaching strategies
- To provide informal/non-formal modes of learning
- To encourage cross-sector collaboration for mentoring
  (teachers, pre-service teachers, teacher educators)


Communication
Distributed Leadership
Knowledge Building Communities
Guided by Experienced Participants
Communities of Practice
Moderator Directed
Learning Communities
Content
Clearly Specified Goal
Apprenticeship
Improvable Community Knowledge

Learning Communities

- Groups are organized around a task and members work for a set period of time.
- Goal is to use communal diversity to achieve deeper understanding of issues, find solutions, or complete a task that would be beyond an individual's capabilities.
- Allows for brief but intense interactions in which an individual identifies strongly with the task, partners, and supporting organization.
- Product is generally a static, inert report.

Communities of Practice

- These are larger groups with shared goals that provide members with richly contextualized and support for learning.
- Focus is on the evolution, preservation, and reproduction of the common or shared understandings of the group.
- Knowledge is shaped as a consequence of modifying practice.
- Product comes in the form of participatory knowledge.

Knowledge Building Communities

- The focus is on the production of external knowledge or cultural artifacts about practice.
- Knowledge is to be recorded and shared, but may be separated from its immediate use or context. (ideas, theories exist as semi-autonomous artifacts)
- Product is dynamic, living documents for the purpose of allowing reuse, improvement and rising above.
- Community knowledge and collective responsibility drives individual knowledge building and vice versa)

Examples

Learning Communities

I*Earn

Communities of Practice

Tapped-In

Knowledge Building Communities

Knowledge Society Network

L’école éloignée en Réseau

Institute for Child Study

Essential Conditions Networked Communities

- Initial Face to Face Contact to Establish Trust
- A Collaborative Software Environment
- Begin with a Specific Goal
- Ensure a Growth Mechanism
- School/District/National Recognition

Challenges of E-learning for Teacher Development

- Understanding the gap between the potential and reality of technology

- Understand key planning and policy issues in use of e-leaning for teacher development such as:
  - Access
  - Adoption: new pedagogical models and tools
  - Effective uses
  - Assessment at the micro, meso and macro levels

Implications for policy makers

- Focus on capacity building for hybrid learning environments and teacher networks
- Keep in mind that Web-supported innovation has two facets: information access and collaborative work
- Initiate innovation-oriented educational research & development programs that emphasize twenty-first century knowledge and skills, blended learning environments, and partnerships
  - Design experiments

Barriers

- Research Culture and Practitioner Culture Divide
- Cost ?
- Transition from a teacher-centred or a learner-centred to a knowledge-centred environment

UNESCO Resources

- www.unesco.org/education