ICTs to Improve Learning and Research

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Overview
Part 1: Information
1. EERA Network 16
2. ICTs in theories and research on teaching and learning
3. Model 1: ICTs in traditional education and research
4. Model 2: ICTs to individualise teaching and learning
5. Model 3: ICTs enabling optimal education and research
6. Questions and discussion

Part 2: Your own learning and research

1. EERA Network 16
ICT in education and training
a. Ljubljana, September 1998
c. ... to study and improve ICT-supported education,
learning and training at all levels of attainment and in
different professional environments
d. ... educational, instructional, (meta)cognitive, social
and motivational processes, performances and effects
e. ... longitudinal research, benchmarks at different
levels, integrated innovation and evaluation designs

Annual Report 2013, Istanbul
• teachers and technology
• ICT and pedagogy
• computer supported collaborative learning
• blended learning
• ICT and social networks
• ICT and special educational needs
• learning with tablet computers
• teacher students and ICT
• E-learning
• multimedia and serious games
http://eerasw16.mixxt.eu

2. ICTs in theories and research
on teaching and learning

a. Internet; mobile; any place; any time; any device
b. Teaching differentiation: information sources; content;
difficulty level; self-regulation; individual/group; time;
place; device; performance; evaluation; progress
c. Learning differentiation: see Teaching
d. Importance of achievement / certification structure
e. Importance of validity of learning (cheating, plagiarism)

ICT-based learning and research: EERJ

<table>
<thead>
<tr>
<th>Model</th>
<th>Assumptions or goals</th>
<th>Applications or examples</th>
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<tbody>
<tr>
<td>1</td>
<td>ICTs to assist or replace traditional education and research</td>
<td>parts of textbooks, assessment by systemic monitoring, large-scale surveying</td>
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<tr>
<td>2</td>
<td>ICTs to promote differentiated teaching and/or self-regulated learning</td>
<td>teaching user/group/category learners, learning=question, explore, evaluate in collaboration, register, evaluate, communicate</td>
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<td>3</td>
<td>ICTs to explore, specify, and check optimal educational conditions including criterion- and norm-based indicators to realise optimal, self-regulated learning</td>
<td>assist differentiated, diagnostically based education, continuous support of teaching and learning across learning environments, theory and research are multidisciplinary and longitudinal</td>
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T. Mooij, ECER/ERC, Porto, Sept. 2014
ICT-based learning and research

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<tr>
<th>Model assumptions or goals</th>
<th>Articles EERJ (in press)</th>
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<td>Model 1: ICTs traditional</td>
<td>Steffens (student at school)</td>
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| Model 2: ICTs differentiated teaching and / or self-regulated learning | Steffens (student at home)  
  • Andrade  
  • Cebrián Robles, Serrano Angulo, & Cebrián de la Serna  
  • Raposo Rivas, Cebrián de la Serna, & Martínez-Figueira |
| Model 3: ICTs optimal educational conditions | Mooij, Dijkstra, Walraven, & Kirschner |

3. Model 1: ICTs in traditional education and research

a. Education & ICTs not really integrated (Steffens: school)  

b. Personal, social, pedagogical, psychological, curricular, home, school, societal variables  

c. Same age: differences in psychological development  

d. (Former) experiences at school, home, other situations  

e. Cross-sectional evaluation (class/school- or norm-based)  

f. Consistency curricular progress and (inter)national level?  

Age-based at-risk groups

Risk --- OK --- Risk  

Age mean  

a) General IQ  

b) Language performance  

c) Arithmetic performance  

d) Social behaviour  

e) Emotional behaviour  

f) Motor behaviour

4. Model 2: ICTs to individualise teaching and learning

• ICTs to accommodate single users, small groups or classes, or specific schools or categories of learners  

• Learning by questioning, exploring, evaluating, and investigating in collaboration with teachers / learners  

• ICTs promote registration, evaluation, communication  
  ➢ Steffens: ICT Use and Achievement: student at home  
  ➢ Andrade: Dialogue and Structure: self-regulation  
  ➢ Cebrián Robles et al.: Federated eRubric Service  
  ➢ Raposo Rivas et al.: Electronic Rubrics to Assess Competences

5. Model 3: ICTs enabling optimal education and research

a. Educational differentiation // differentiation learners  

b. Beginning characteristics learners (appropriate placement)  

c. Teaching and learning & ICTs:  
  • adapted to individual / small group / group  
  • clarity necessary/prescribed and own/creative tasks  
  • differentiation in self-regulation and teacher assistance  
  • double diagnostics (criterion, norm, both integrated)  
  • immediate evaluation and feedback in flexible settings
Environmental influences on a pupil’s development (example of three-level model)

Towards norm- and criterion-based learning: systemic innovation

• Age- or norm-based: specific tasks, criteria, adaptations
• Criterion- or content-based:
  - series of tasks according to psychometric criteria
  - curriculum: absolute evaluation, continuity in progress at own individual level of competence
• Both: double diagnostics
• Development of education // ICTs
• Multilevel, multidisciplinair, longitudinal
• Examples school transformation model 3: Mooij et al., EERJ

6. Questions and discussion

Questions?
  a. Theoretical?
  b. Models?
  c. Methodological?
  d. Practical?

Part 2: Your own learning and research

Model 1: ICTs assist/replace traditional education/research
Model 2: ICTs promote differentiated teaching and/or self-regulated learning
Model 3: ICTs enabling optimal educational conditions incl. criterion- and norm-based indicators to realise optimal, self-regulated learning

Answer in small groups

Report to all

General discussion and conclusions
References 1


T. Mooij, ECER/ERC, Porto, Sept. 2014

References 2


T. Mooij, ECER/ERC, Porto, Sept. 2014