Teachers’ professional development in an online community: critical factors emerged from the project IPEC

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As a geographical context …
University of Aveiro

• created in 1973
• about 13,000 students
• graduate and pos-graduate courses
  • teachers education, arts
  • sciences, math, ...
  • engineering
  • health
  • ...
• member of the

  European Consortium of Innovative Universities
Summary

- The problem
- Presentation of the project IPEC
- Methodology
- The work developed by the community
- Interaction facilitating and barrier factors
- Research and practice articulation factors
- Final comments
The problem

- Teaching as a complex activity
- Close articulation between teachers and researchers is needed (Alarcão and Canha, 2008, Costa, 2003, Ratcliffe et al., 2003, Eylon et al., 2008)
- Big efforts: EPSE, CSIP, ILF, Tapped-In, ...
- ... there is still a long way to do (Lai et al., 2006)
The problem

- Factors that hinder the articulation between researchers and science teachers (Loureiro et al., 2006):
  - resistance to change,
  - isolation and culture of individualism
  - inadequate teachers’ professional development (TPD)
  - …

Need of rethink strategies for TPD

Communities of practice (CoP) may be useful (Lai et al., 2006)
The problem

Teaching Practices

Interaction

Researching Practices

How to improve?

project ipec
Main assumptions of the project:

- There is a gap between educational research and practitioners.
- It is important to promote interaction between those communities.
- Research needs to focus on studies developed by researchers and practitioners.
- Role of ICT and online CoP.
Presentation of the project

- **The Community** (May 2006 – September 2008)

  - 30 science teachers and 10 science education researchers
  - online communication technologies and face-to-face meetings

  - Curricular modules about Sustainability
    - Group 1: exploration of a park of nature / study of human occupation of the territory
    - Group 2: analysis of the environmental impact of a granite quarry
    - Group 3: evaluation of a school energetic management
    - Group 4: study of processes of management of human’s residues

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Methodology

- Qualitative, exploratory and case study
  - the case: IPEC community

- Data gathering
  - interviews (focus-group – initial and final perceptions)
  - questionnaire (online, about barriers perceptions)
  - documental analyses (teachers’ final reports, minutes)

- Data analyse
  - content analysis, descriptive statistics
For example, in the group 2

**Preparation for the fieldtrip**

3 lessons of 90 min.

- Internet search;
- Presentation and discussion of the searches;
- Discussion of methodological issues relevant to the field trip;
- Preparation of equipment for the field trip.

**Thematic**

Sustained exploration of geological resources

**Central-Question**

What tactics have been carried out at Quarry Quinta do Moinho to a sustainable exploitation of its resources?

**Sub-question**

- How to characterize the Quarry Quinta do Moinho on the geologic feature?
- How to characterize the Quarry Quinta do Moinho on the materials produced?
- How to characterize the Quarry Quinta do Moinho on human occupation of the territory?
- How to characterize the Quarry Quinta do Moinho on landfill of inert waste?
The work developed by the community

- For example, in the group 2

**Fieldtrip 1 afternoon**

- **Central-Question**
  *What tactics have been carried out at Quarry Quinta do Moinho to a sustainable exploitation of its resources?*

- Realization of the proposed activities in the field trip guide (for example: “Characterize the quarry's rock in view of its mineralogical composition, texture and colour.”)
- Collection of materials (rock and water samples, produced material, ...) and photographic record of the most relevant issues
- Presentation to the class of the observations made, the conclusions reached and the doubts that remain

- **Debate / discussion about the information shared by all working groups**
The work developed by the community

• For example, in the group 2

- Realization of practical activities for the identification of the rock samples collected / Conducting laboratory activities of water analysis
- Preparing a document that synthetises the most relevant issues worked by each group during the previous phases
- Presentation to the class of the conclusions reached in the activities, responding to the sub-questions of each group

After the Fieldtrip
2 lessons of 90 min.

Debate / discussion

Answer to the Central-Question: What tactics have been carried out at Quarry Quinta do Moinho to a sustainable exploitation of its resources?
Interaction facilitating and barrier factors

- THEMATICS FROM THE TEACHERS’ NEEDS
- DIFFICULTIES OF TECHNICAL NATURE AND IN REMOTE COMMUNICATION
- ADAPTING TO NEW WAYS OF WORKING AND BREAKING ROUTINES
- BLURRED ROLES OF DIFFERENT STAKEHOLDERS
- LACK OF TIME / INTERRUPTIONS
- LACK OF PRE-REQUISITES
- SOCIAL BARRIERS – INITIAL INHIBITIONS AND FEARS, …

- FACE-TO-FACE MEETINGS (DECISION-MAKING) AND ONLINE DISCUSSIONS (REFLECTION)
- NATURE OF INTERACTIONS, DYNAMICS AND PERSONAL STYLES (MUTUAL RESPECT AND TRUST, SHARING IDEAS AND QUESTIONING, NO FEAR OF TRIAL, REFLECTION, ACTIVELY ENGAGED)
- (SHARED) LEADERSHIP
  - NEEDED FOR THE INTERACTION
  - SHARED AMONG RESEARCHERS AND TEACHERS
  - FEATURES - ENTHUSIASM, KEEP THE INTERACTION, FEEDBACK, CRITICAL SENSE, INTEGRATE AND BUILD BRIDGES
- ROLES OF RESEARCHERS
  - LEADERSHIP, PRESENCE, FACILITATORS
- TIMELY FEEDBACK AND CONTINUED INTERACTION
- PRIOR PERSONAL KNOWLEDGE

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Research and Practice articulation factors

- disclosure of problems emerging from practices
- planning
- reflection
- implementation
- evaluation
- collaboration

- sharing information, materials and experiences
- negotiating and reflecting, individual and in group
- discussing teachers' own work
- researchers as facilitators

Personal and professional development and articulation between research and practice

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Final comments

• Contributions of IPEC:

✓ contribution for answering to the teachers’ needs
✓ decreasing of teacher’s isolation
✓ promotion of TPD
✓ articulation between research and practices, which contributed to innovation at school level
✓ multiple communities of teachers, with possible impact on the learning of a large number of students
Final comments

• Limitations of IPEC:

✓ short contribution for an in depth theoretical framework
✓ difficulties in the interplay between theory and practice (at least in some groups)
✓ small interaction between the various groups
✓ the load time required for "nurturing" these communities
Thank you for your attention!
References

References


- Marques, M. M., Loureiro, M.J. & Marques, L. (s.d.). Planning innovative teaching practices in a community of practice: a case study in the contexts of the Project IPEC. Paper accepted to publication at International Journal of Web Based Communities, Special Issue, x(x), xx
