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Para citar esta obra:
Peers interaction, joint activity organisation and the uses of ICT for the construction of knowledge in school

María José Rochera, Rosa Colomina, Javier Onrubia
University of Barcelona, Spain
Theoretical background

- A socioconstructivist approach to the teaching and learning processes with ICT
  - Learning with ICT both as an individual process of knowledge construction and a social process supported by students and teacher
  - The relevance of joint activity for the construction of knowledge in school: the relationships among students/content-tasks/teacher and the evolution of joint activity during the teaching and learning processes

Theoretical background

- **ICT as a mediating tool** of the joint activity among students/content-tasks/teacher. ICT as psychological instrument
  - ICT as a mediating tool of the intrapsychological processes
  - ICT as a mediating tool of the interpsychological processes

- The importance of the teacher’s assistance for the knowledge construction in teaching and learning processes that integrate the working group and the use of ICT
Aims

- To identify and describe the uses of ICT that emerge and develop in joint activity among students in two face-to-face (F2F) educational situations.

- To identify some of the characteristics of the teacher’s educational intervention for mediating the processes of knowledge construction in peers interaction.

- To evaluate the potential of a model of analysis of educational influence in a context of learning and teaching that integrate ICT in order to understand the knowledge construction among students.
Methodology

- Observational approach, qualitative analysis, case study methodology

- Two face-to-face educational situations of compulsory education in Spain (Primary and Secondary Public School)

- No purpose of contrast between them
Methodology

Instructional sequence 1 (IS1)

- 6th grade class of primary public school (12-y-olds)
- Project Edumet. “Climate and weather”
  - Cooperative learning in groups of 4 students in the classroom
  - Cooperative learning among different schools (through a web)
  - Learning of scientific methodology
  - The use of ICT
- 4 phases of project (20 sessions along 4 month)
  - Presentation of schools participants
  - Joint construction of a meteorological data base
  - Investigation
  - Conclusions exchange

www.edebedigital.com/proyectos/228/
Instructional sequence 2 (IS2)

- Secondary public school students (14 y-olds) and their teachers Project “To Know Barcelona”
- Final assessment of secondary school, based on collaborative group work
- Groups under the supervision of teachers

4 phases of project (19 sessions along 2 weeks)
- Presentation of project
- Preparation and realization of one itinerary in group through the city of Barcelona
- Small group collaboration
- Oral presentation of work in front of the school assessment committee
Methodology

- The model of analysis of joint activity and the uses of ICT in an Instructional sequence

  - Units of Analysis
    - Instructional sequence (IS)
      
      *A complete sequence of teaching learning process: planned and actual development of IS*
    
    - Joint activity segments (JAS)
      
      *The forms in which joint activity is organized along the IS*
    
    - The uses of ICT
      
      *The forms in which ICT is used within each joint activity segment*
Methodology

- **Procedure of data collection**
  - **Planned instructional sequence**
    - Interviews with teachers and students
    - Instructional planning documents and other teacher made didactic materials and pupils’ products
  - **Actual development** of instructional sequence
    - Electronic interactions trace files
    - Audio and video classroom recording. Narrative notes
    - Interviews with teachers and students
Methodology

- Procedure of data analysis
  - Analysis of planned design of instructional sequence
    - instructional phases, instructional activities
    - technological resources available and uses of ICT
  - Analysis of actual developmental of instructional sequence
    - A static analysis
      Joint activity segments (JAS) and uses of ICT in the joint activity segments
    - A dynamic analysis
      Evolution of JAS and uses of ICT in the JAS during the instructional sequence
Results

- I. ICT as mediating tools for the knowledge construction

- II. Teacher as mediator of the knowledge construction in the working group
Results I. ICT as a mediating tool…

- 1. ICT as a mediating tool between students and the content/task of learning
  - 1.1. ICT as instruments to perform tasks (or learning content) between students in the classroom
    - ICT as cognitive tools (IS1&IS2)
      - The students elaborate a text and messages (Word) and a diagram (Excel) in JAS of data elaboration in working groups
    - ICT with instrumental use (IS1&IS2)
      - The students copy the data from the paper to the data base in JAS of collecting and storing data in working group
Results I. ICT as a mediating tool...

1.2. ICT as instruments to look for or select the relevant contents (S2)

*The students look for and select the relevant information from the web about the Barcelona’s city in JAS of assisted realization of students’ products*
Results I. ICT as a mediating tool…

- 2. ICT as an instrument to present and communicate the meanings about the contents
  
  - 2.1. ICT as an instrument for cooperation and communication between students from the same small-group (IS2)

  Two pairs of students from the same small-group exchange information through the intranet in JAS of assisted realization of students’ products
Results I. ICT as a mediating tool...

2.2. ICT as an instrument for cooperation and communication among students from different schools (through the web Edumet) (IS1)

- **ICT as a communicative tool**
  
  *The students publish messages in the forum Edumet in JAS of data elaboration in working groups*

- **ICT as a collaborative tool**
  
  *The students from a school construct the meteorological data base in JAS of collecting and storing data in working groups*
Results I. ICT as a mediating tool…

- 2.3. ICT as an instrument to present and communicate the meanings about the curricular contents or ICT contents by students to teacher (in assessment situation) (IS2)

- ICT as an amplifying instrument to the student actions

Students use ICT for the oral presentation of their learning product as a result of their team work JAS of presentation of the products to the assessment committee

Tabla de fase 1
Results II. Teacher as a mediator…

- The different uses of ICT by the teacher in order to help the students
  - ICT as an instrument to establish the activity setting
  - ICT as an instrument for the presentation of communication of learning content
  - ICT as an instrument of regulation and control

- The teacher’s help depends on the relationship and the articulation between the ICT-supported activities and the tasks without ICT
Conclusions

- The complexity of instruments of mediation for the knowledge construction in joint activity among students along the instructional process

- The multiple and different uses of ICT in joint activity among students during the instructional sequence

- The responsibility of students in the uses of ICT for the knowledge construction
Conclusions

- The relevance of context of activity along the instructional sequence for understanding the knowledge construction between students
  - The sequence of forms of joint activity segments among students and the uses of ICT in these forms of joint activity among students
  - The nuclear role of teacher’s assistance for the construction of joint activity and uses of ICT in peer interaction
  - The importance of planned instructional sequence and the helping of teacher during joint activity among students when students need helping
Conclusions

- The methodological importance of carrying out an analysis that allows...
  - To study the students’ interaction as well as student-teacher interaction
  - To study the uses of ICT in relation to the joint activity
  - To consider the joint activity and the uses of ICT along the temporal dimension of the teaching and learning process
  - To respect the characteristics of the particular ICT supported teaching and learning contexts
Conclusions

- In order to improve our understanding of the impact of ICT in education we need a deeper study of:
  - The differences of uses of ICT among students who participate in the same instructional sequence
  - The difference between the planned uses and the eventually developed uses, identifying a likely ‘uner-use’ of some potentialities
  - Uses that are likely to either be conservative or innovative of educational practices
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María José Rochera, Rosa Colomina, Javier Onrubia
University of Barcelona, Spain

mjrochera@ub.edu

http://www.ub.edu/grintie

Thank you for your attention!

Funded by the Comision Interministerial de Ciencia y Tecnología
(grant number: BS02001-C02-01)