2nd ITERATION REPORT

I-curriculum visited in Barcelona five different schools in order to compile data for the 2nd iteration stage. The selection of these schools has been made randomly among those of different neighbourhoods of Barcelona city (4) and outskirts (1). This type of selection was chosen because the aim of the second iteration is to test the I-curriculum framework in regular schools.

The schools visited are listed in the table below. All of them are public institutions:

Schools & website	*Location, neighbourhood and Address*	*Contact Person*	*What s/he does*	*Telephone Number*
IES SECRETARI COLOMA http://www.xtec.es/centres/a8047421/	- Barcelona - Gracia - Secretari Coloma 25	Mª Carmen Diez + Joan (inglés)	Technology subject coordinator in the ESO + English teacher using ICT in class	93-2853491
IES SERRAT i BONASTRE http://www.bcn.es/serratibonastre/	- Barcelona - Sant Gervasi - Marqués de Santa Anna 4	Jaume Oliver + Joan Jarque	Head of studies in ESO + Technology teacher	93-2174142
IES PRÍNCIPE DE GERONA http://www.xtec.es/centres/a8033894/	- Barcelona - Horta – Guinardó - Trav. Gracia 357	Enrique Alonso	Technology teacher	93-4362608
IES JOAN BOSCÀ http://www.iesjoanbosca.org/pages/jb00.htm	- Barcelona - Les Corts - Av. Esplugues 40	Raul Allende	Technology subject coordinator in the ESO	93-2033458
IES MARGARIDA XIRGU http://www.xtec.es/ies-margarida-xirgu/	- Hospitalet de Llobregat - Collblanc - Trav. Collblanc, 56	Joaquim Sampere	Technology subject coordinator in the ESO	93-3339448

The general tendency in the schools visited is to follow operational ICT literacy in the core subjects, while leaving to the non-compulsory subjects (variable credits) other dimensions of the proposed I-curriculum framework.

We contacted the head of the ESO[1] studies of each of these schools in order to know what the schools are currently doing regarding ICT curriculum. They directed us to the heads of the ICT implementers in the school (mostly teachers of the subject called "Technology") or to teachers that are working with ICT in their subject.

The schools that agreed to participate completed an interview[2]. We negotiated to do a classroom observation with the purpose of knowing:

I. what the lesson is about, description of the tasks, and what the meta-skills teachers are pursuing
II. what students are actually doing
III. how teachers assess and give feedback to the students.

In the following section we report briefly the most relevant aspects of the ICT program in each school. After that, we present a general conclusion for testing, upgrading and analysing the I-curriculum proposed framework.

[1] ESO : Secondary Compulsory Education
[2] The interview has been made following the instrument provided by Germany and some points responding to the UK table, which is semi-structured.

- **SCHOOLS REPORT SECTION**

As stated, we have randomly selected only public schools. We focused on low secondary level (first cycle: 12-14 year-old students). The experiences observed and the teachers' report on what they are doing correspond to regular traditional courses. They use ICT to follow subject contents and to respond to assignments of other core subjects.

The school follows the current curriculum[3]. ICT literacy is promoted primarily in the "Technology" subject. Also the schools visited offer non-compulsory courses (variable credits) on different tools use, such as Drawing with Computers, Flash programming, Dreamweaver, etc. These subjects are decided by the teachers in the planning of the year course.

1) IES SECRETARI COLOMA

This school is located in a Barcelona neighbourhood in downtown. The socio-economic situation of the school is medium level. Most of the students have a computer at home and this influences their skills when working with ICT in class. The percentage of immigrants is low; therefore, there are no problems regarding cultural differences.

The website of the school is currently under construction: http://www.xtec.es/centres/a8047421/.

In this school they were doing a test posed by the regional authorities (Generalitat de Catalunya) about ICT competencies, so the school decided to direct us to a regular classroom on the subject "English". In this classroom the teacher has introduced ICT as a way to work on the subject. He follows different projects available in the www.xtec.es. For instance, he followed one of these projects the last trimester (www.xtec.es/iesronda/13projec.htm). Nowadays, he is leading a web quests project (which is the experience we observed), available at http://www.xtec.es/crle/02/webquests/english/2index2.html .

- **INTERVIEW DATA:**

The interviews were made to both the coordinator of the "technology area" and the English teacher who used ICT in the classroom observed.

Allocation of Contents in the curriculum	How to use text processing tools, spreadsheets, data bases, presentations, graphic design, informatics theory and linguistic issues. -> Technology subject. Maths programmes -> Maths subject Telematic projects or web quests -> Language subjects Sound credit -> variable credit "Special enigma," a game for all the students -> April 2004. (free activity to do at home)
Equipment (hardware/ software)	Two computer rooms with 7 computers each + 1 server. All the computers are "frozen." Software: MS Office, Wordbench, Autocad, simulators, Internet applications.
Information retrieval: *a) What use was made of ICT and in which way (formally: use of search engines etc.)?* *b) How was information selected? How was its accuracy*	a) Primarily they learn the basic literacy on operational level during the technology subject (divided into four years, one per course). In this subject they learn how to use MS Office, Autocad (last course), and in the last two years some aspects about how to do a guided web search. The websites used to search for

[3] Responding to question 1 proposed in the German instrument. To check the national curriculum, please check the "Spanish curriculum report."

measured? *c) How did collaboration take place? How (and with whom) were results exchanged? How were ideas exchanged?*	information are www.edu365.com and www.google.es . b) The information selection criteria was given by the teachers as the searches are guided activities. They observe that year after year the students improve their search skills although they recognise that this is mostly because of their use outside of school (at home). c) Tasks are performed in groups of two. They only present the tasks to the teacher that evaluates the products.
Task development: *a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)* *b) How did collaboration take place? How (and with whom) results were exchanged? How ideas were exchanged?* *c) How was the presentation designed regarding the audience's needs?*	a) Mostly they do reports in text files. Sometimes they include images but it is up to the students. b) Collaboration takes place among peers. Teachers interact as guides, solving problems, directing the activities, and correcting the assignments. There is not a real information exchange. c) They do not address audience needs because the products are always directed to the teacher.
Assessment and feed-back	Assessment is done analysing the products, if they correspond to the requirement, completeness, correctness, presentation, richness and appropriateness.
Global approach: *a) Were search strategies transferred and how? Were development strategies transferred and how?* *b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future?* *c) What were the main problems? How to solve them?*	a) The students transfer operational skills to the other subjects mostly in the presentation of reports or assignments. Most skills transferred are the skills they use at home, such as messenger, e-mail, etc. b) In baccalaureate there is information exchange and public presentations but not in the ESO level. Reflection on ICT influences for life is done in the baccalaureate level. c) Main problems identified were: - How to control a group when working with the computers. - Diversity of levels in the same group.

- **OBSERVATIONAL DATA:**

The students were searching for logos of enterprises in the USA. Once they had discovered what company they were checking, they had to review what the environmental politics of this enterprise was. After that, they had to generate a table with all the companies and evaluate them on environmental issues. Students decided if it is responsible to go on consuming their products, and the advantages and disadvantages of rejecting or buying them.

At the moment of the observation they were either reflecting on the advantages and disadvantages or finishing the web search.

Subject	English compulsory subject (foreign language)
Teacher	Joan – English teacher
Aims of the activity	To search on the web for information about how to be a responsible consumer (Web quest) – Then they have to create surveysand reports, search for images, generate personal opinions to discuss with classmates, etc. Main aim: Practice English language. ICT are only a facilitator for this purpose.
Equipment (hardware/software)	Computer room (15 computers) Internet – web quests from the Xarxa Telemàtica de Catalunya (www.xtec.es)
Number of students and rate	14 (2 students per computer)

Time of the activity	1 hour
Time of the subject	One year course.
Moment	They were in one of the last sessions of the course. This activity is up to the teacher and they are doing it once a week with half of the group. They do three hours per week of foreign language classes.
How is it used?	They mostly use Google in searching for information. In the web quest there are some indications of where they can search or advice for starting.
Role of the teacher	Guide. He proposes the tasks and solves doubts about linguistics. The feed-back is horizontal, among classmates too.
Skills of the teacher	User level. He only uses MS Office pack and the Internet. He's not an expert but tries to improve the classes with sources available on the Websites of the Generalitat and Xtec. Thus, he can vary the content more than in the past when he had to follow the textbook only. He finds it important that students can work on real things (as the web quest observed) in order to motivate them and make them realise the importance of knowing English for their life. ICT is not his interest but considers that with this activities they can improve their searching and synthesis skills, producing reports and reflecting on transversal issues related to values and other aspects.
Role of the students	Collaborators; they help others and are helped. Working in small groups and performing common exchange activities with the whole group helps them to work horizontally.
Skills and meta-skills development	Searching skills, selection skills, synthesis and reflection skills, creation and reporting skills, critical thinking skills, linguistic skills, writing expression skills, awareness.
Assessment	Based on products. He observes the progress in class and takes it into account but the main factor is to correct the exercises. Although it is a language class, he takes into account the maturity of the reports, that everything including linguistic aspects has been done correctly.
Innovations	ICT are used in a traditional core subject to make it more dynamic. While students are working on subject contents, such as orthography, grammar, vocabulary, etc., they can accomplish real learning just working on interesting things. Thus, the cultural and critical level are present in this experience in producing products with ICT and English language to create questionnaires, do reports, give opinions, search for data on the Web, etc.

2) IES SERRAT I BONASTRE

This school is located in a wealthy neighbourhood The socio-economic situation of the school is high-medium level. Most of the students have a computer at home and this influences their work with ICT in class. The immigration rate is low (under15%); therefore, there are no problems regarding cultural differences, although this phenomena has grown in the last years.

The website of the school: http://www.bcn.es/serratibonastre/.

- **INTERVIEW DATA:**

The interview has been made to the technology subject teacher and the head of studies. The observation was done in a "non-compulsory" subject led by the technology teacher interviewed.

Allocation of Contents in the curriculum	How to use text processing tools, spreadsheets, data bases, presentations, graphical design, enterprise management simulation -> Technology subject. Cad and drawing design supported by computer credits -> variables

	History and language subjects -> sometimes use the Internet to enlarge on some unit or do exercises. Catalan culture -> instead of religion they do web quests related to Catalonia. The use of ICT in core subjects is up to the teacher.
Equipment (hardware/ software)	4 Computer rooms with 12/10/15/15 computers + 1 server. Software: MS Office, Autocad, Openoffice (draw), GIMP, Internet applications.
Information retrieval: *a) What use was made of ICT and in which way (formally: use of search engines etc.)?* *b) How was information selected? How was its accuracy measured?* *c) How did collaboration take place? How (and with whom) were results exchanged? How were ideas exchanged?*	a) Primarily they do the basic literacy on operational level during the technology subject (divided in four years, one per course). In this subject they learn how to use MS Office, Autocad (last course) and in the last year they learn how to create and manage an enterprise using the computer. When using the Internet the searches are guided. The websites used to search for information are www.xtec.es and www.google.es . b) The information selection criteria are given by the teachers as the searches are guided activities. They observe that year after year the students improve their search skills although they recognise that this is mostly because of their use out of school (at home). c) Tasks are performed in groups of two, or in the variable credits individually. They only present the tasks to the teacher who evaluates the products.
Task development: *a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)* *b) How did collaboration take place? How (and with whom) results were exchanged? How ideas were exchanged?* *c) How was the presentation designed regarding the audience's needs?*	a) Mostly they do reports in text files. Sometimes they include images but it is up to the students. In the variable credits they present the tasks saved in the same format that they are working with, or in drawing design in jpg. b) Collaboration take place among peers. Teachers interact as guides, solving problems, directing the activities, and correcting the assignments. There is not a real information exchange. c) They do not differentiate because the products are always directed to the teacher.
Assessment and feed-back	Assessment is done analysing the products: if they correspond to the requirement, completeness, correctness, presentation, richness and appropriateness.
Global approach: *a) Were search strategies transferred and how? Were development strategies transferred and how?* *b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future?* *c) What were the main problems? How to solve them?*	a) They transfer operational skills to the other subjects mostly in the presentation of reports or assignments. Most skills transferred are their own skills related to their use at home, such as messenger, e-mail, etc. b) In baccalaureate there is information exchange and public presentations but not in the ESO level. Reflection on ICT influences for life is done in the baccalaureate level. c) Main problems identified were: - What kind of software is available for education - Equal access to software - Problems of acquisition of software. - Basic things, such as creating folders, were difficult for students. Conversely, the use of tools, creation of products or search using the web was simple for them.

- **OBSERVATIONAL DATA:**

The students were doing drawings of 4 different kinds using the software “Open Office” which is similar to Corel Draw. They had to create the proposed drawings and create advertisements for different topics (e.g. an ad for a restaurant with the drawing of a

chef). In the following session they had to bring their own proposal and, after receiving the teacher approval, complete it.

Subject	Variable credit "drawing and design supported by computer"
Teacher	Joan Jarque – technology teacher
Aims of the activity	To draw using the computer. Learn how to create ads and murals. To create images of their own to incorporate into their own products in other subjects or during their life.
Equipment (hardware/software)	Computer room (15 computers) Open office – draw
Number of students and rate	10 students (one per computer) 1 of them was a special education student who followed the class with the help of a support teacher.
Time of the activity	1 hour
Time of the subject	One trimester.
Moment	They were in one of the last sessions of the course. The last assignment was about their own proposal.
How is it used?	They used the computer to draw. Some of the students used the windows media player to listen to music while performing the activity.
Role of the teacher	Guide. He proposed the tasks and solved doubts about the tools or the task. The feed-back was horizontal, among classmates too.
Skills of the teacher	Technology teacher. He knows pretty well all the MS Office pack and is able to teach Autocad, Internet search and Drawing and designing using the computer. He is mainly focused on procedural tasks and his aim is that all the students will know how to draw when finishing the credit. Mainly, he teaches at an operational level.
Role of the students	Collaborators; they help others and are helped, although the individual nature of the organization of this subject requires that they collaborate informally and use their own initiative. They are only responsible for their own tasks.
Skills and meta-skills that aims to develop	Creation skills, creativity and visual design skills.
Assessment	Based on products. He observes the progress in class and takes it into account but the main factor for assessing is the richness of the product.
Innovations	There were no real innovations. The most interesting point in this school was the concern of the teacher to introduce students to software that can be used in PC's and Macs. He is worried about the software that all the schools are using for education and tries to use freeware in order that students can access it without costs.

3) IES PRÍNCIPE DE GERONA

This school is located in a Barcelona city neighbourhood. The socio-economic situation of the school is medium. Most of the students have a computer at home but the percentage of immigrants (over 30%) influences the classroom academic level. Diversity in the class is an issue to take into account in this school.

The website of the school is: http://www.xtec.es/centres/a8033894/. On this website you can check the products done by the students, such as their own web pages, flash products, etc.

- **INTERVIEW DATA:**

The interview and the observation have been made with the coordinator of the technology area.

Allocation of Contents in the curriculum	How to use text processing tools, spreadsheets, data bases, presentations, graphical design, informatics theory

	and linguistic issues. -> Technology subject. Maths programmes (clic and Wis) -> Maths subject Languages programmes (clic, Galí and web quests) -> Languages Informatics (basic knowledge and tools use) -> variable (but the school has decided that although it is of free election, all the students have to chose it) Web pages creation (dreamweaver) -> variable credit Flash -> variable credit
Equipment (hardware/ software)	3 Computer rooms with 10/15/9 computers + 1 server Linux Proxy-WEB and contents controller. For baccalaureate there is one computer per each class, and the library has 8 computers of free access for all the students. All the computers are frozen. Software: MS Office, Autocad, Dreamweaver, Flash, paint shop pro, Internet, School-webpage (to upload products).
Information retrieval: *a) What use was made of ICT and in which way (formally: use of search engines etc.)?* *b) How was information selected? How was its accuracy measured?* *c) How did collaboration take place? How (and with whom) were results exchanged? How were ideas exchanged?*	a) Primarily they do the basic literacy on operational level during the technology subject (divided in four years, one per course). The Informatics variable credit completes the operational literacy. In these subjects they learn how to use MS Office, Autocad (last course) . When using the Internet the searches are guided in the first cycle. After that the students can search by themselves. They use all types of websites. The main website is www.google.com . The youngest learn how to navigate through image searching. b) The information selection criteria is given by the teachers as the searches are guided activities. The criteria for selection is different depending on the kind of problem to solve. They observe that year after year the students improve their search skills. c) Tasks are performed in groups of two. They make presentations for the class in Power Point, present assignments to the teacher and upload their products of the variable credits to the school website. Then, there are three levels of information exchange: with the teacher, among the peers, and with everybody that wants to check the school website. The information exchange is done by MSN messenger and by e-mail by the students voluntarily. There is little counselling demand via e-mail with the teachers.
Task development: *a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)* *b) How did collaboration take place? How (and with whom) results were exchanged? How ideas were exchanged?* *c) How was the presentation designed regarding the audience's needs?*	a) For the core subjects tasks they do reports in text files with images included. In the variable credits they present different types of products: web pages done with dreamweaver, flash films, images created by them or Power Point presentations. They use video, image, audio and text to create their products, so the multimodality is present in this school. An example of students' product is: http://iespgirona.xtec.es/%7Eevidal/flash/flash1.swf b) Collaboration take place among peers and with the teacher. Teacher interacts as the guide, solving problems, directing the activities, and correcting the assignments. Communication is at a horizontal level and the teacher is one of them. The information exchange is made by e-mail or through the class context proposing sources, etc. c) The students adapt their products to the audience for whom they are doing the product. If it is an internal Power Point presentation for peers, they try to use more images and less text, making an oral presentation. For their webpage they try to follow net-etiquette criteria as it is public for everybody. For the teacher they present the

	requirement and explanation related to the task, the resources, etc. Students improve year after year.
Assessment and feed-back	Assessment is done analysing the products, if them correspond to the requirement, completeness, correctness, presentation, richness and appropriateness. The observation of the progress the students make during the course is highly taken into account for the assessment. The assessment is done under a qualitative approach and continuously.
Global approach: *a) Were search strategies transferred and how? Were development strategies transferred and how?* *b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future?* *c) What were the main problems? How to solve them?*	a) They transfer operational skills to the other subjects mostly in the presentation of reports or assignments. Most skills transferred are from their use at home, such as messenger, e-mail, etc. b) (See previous part of task development) The implications ICT have for the students' life are not treated in the ESO but in the baccalaureate. Language is not worked on directly, but the students who choose variable credits related to the use of tools buy informatics magazines and improve on their own. c) Main problems identified were: - Difference of levels in the same group. The solution for that problem is to propose tasks that do not require a synchronous development and to have ready some extra tasks for the people with more advanced level. It is important to calculate the medium level in order to have ready the extra tasks and adapt the assignments to the groups' capability. - Assessment is difficult when working in pairs. It is difficult to determine if both students are learning the same or if one is doing all the work.

- **OBSERVATIONAL DATA:**

The students were doing image treatment to use it for their web pages. This activity is part a non-compulsory subject (variable credit) named "Website creation".

Subject	Website creation (variable credit)
Teacher	Enrique Alonso – Technology teacher
Aims of the activity	To create images with different grades and effects.
Equipment (hardware/software)	Computer room (10 computers) + 1 computer for the teacher + server Paint Shop Pro (for task development) + Net-support school Pro (to show the task on all the computers – the teacher works from one computer and everybody sees it)
Number of students and rate	14 (2 students per computer)
Time of the activity	1 hour
Time of the subject	One trimester course.
Moment	They were in one of the last sessions of the course, learning how to treat images to improve the creation of their own website (main product of the course). It is a 6 hour task.
How is it used?	They used the Paint Shop Pro with images provided by the teacher, available in their own directory for this credit.
Role of the teacher	Guide and classmate. He proposes the tasks and solves doubts; moreover, he contributes to their creations.
Skills of the teacher	Expert. He has written books about programming. He tries to make literate all his students in order that they will have the skills to be able to improve on their own after finalising the ESO.
Role of the students	Collaborators; they help others and are helped. Working in small groups and performing common exchange activities with the whole group helping them to work horizontally.
Skills and meta-skills	Image treatment skills, work development ability, ability to adapt the

that aims to develop	product to the audience, reflection skills, own interest development.
Assessment	Based on products. He observes the progress in class and takes it into account but the main point is the task completion and the final product. The teacher has to observe a lot in class in order to assess correctly.
Innovations	Students are able to create products based on their own interests and this is a high motivating factor for them to develop ICT skills. They see the usability of this subject for their own future lives and most of them get encouraged to pursue informatics studies or related studies after finalising the ESO.

4) IES JOAN BOSCÀ

This school is located in another Barcelona city neighbourhood in which the socio-economic situation is medium level. Most of the students have a computer at home. The low percentage of immigrants does not influence the class development.

The website of the school is in the address:
http://www.iesjoanbosca.org/pages/jb00.htm.

- **INTERVIEW DATA:**

The interview and the observation have been made with a teacher of the technology area .

Allocation of Contents in the curriculum	How to use text processing tools, spreadsheets, data bases, presentations, graphical design, informatics theory and linguistic issues, hardware terms, relation between computer-user-products. -> Technology subject. Maths programmes -> Maths subject Drawing using computer -> variable credit
Equipment (hardware/ software)	2 computers room with 15 computers + 1 server + Projector + Internet connexion. Software: MS Office, Dreamweaver, paint shop pro, Internet, 2 School-webpages.
Information retrieval: *a) What use was made of ICT and in which way (formally: use of search engines etc.)?* *b) How was information selected? How was its accuracy measured?* *c) How did collaboration take place? How (and with whom) were results exchanged? How were ideas exchanged?*	a) primarily they learn the basic literacy on operational level during the technology subject (divided in four years, one per course). In these subject they learn how to use MS Office. Use of the Internet takes place mainly in the second cycle. They use all types of websites. The main website for searching is www.google.com . The youngest learn how to navigate using different types of searching (advanced search, images, etc.) b) There are no specific defined criteria when selecting information, but teachers try to assure its value according to their own opinion, encouraging students to find the best information required, instead of taking simply the first option. c) Tasks are performed individually, as now they have one computer per student (in this subject). But sometimes they use the network within the classroom to share information between students. They also share results by presentations in Power Point and assignments to the teacher.
Task development: *a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)* *b) How did collaboration take place? How (and with whom) results were exchanged?*	a) For the core subjects tasks learners do reports in text files with images included. The learning process is based on a project/report students have to develop around a matter of another subject. They also have to develop a presentation in Power Point at the beginning and at the end

How ideas were exchanged? *c) How was the presentation designed regarding the audience's needs?*	of the course, so they use image, audio and text to create it. As for the use of video, although they sometimes have used it, it isn't very usual because of technical problems. b) Collaboration its not considered as a priority goal, as the general thought is that every student has to have his/her own computer in order to really acquire ICT competences. That's why this year the school has obtained one computer per student. Then, all tasks required for the subject can be developed individually. On the other side, there is the teacher, who interacts as the guide, solving problems, directing the activities, and correcting the assignments. The information exchange is made through the class context proposing sources, or occasionally through the work net. c) The students adapt their products to the audience for whom they are doing the task. For the teacher they present the requirement and explanation related to the task, the resources, etc. Students and teachers agree on the topics of their tasks and the way they develop them. As tasks required for informatics subject are related to other subjects, students sometimes present them in these other courses and they adapt their work to them.
Assessment and feed-back	The assessment is done under a qualitative approach. There is no exam. Assessment is done analysing the products, if them respond to the requirement, completeness, correctness, presentation, richness and appropriateness. The observation of the progress the students do during the course is highly taken into account for the assessment. It is a continuously assessment, as teachers are continuously giving feed-back to learners on their work.
Global approach: *a) Were search strategies transferred and how? Were development strategies transferred and how?* *b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future?* *c) What were the main problems? How to solve them?*	a) There are difficulties to assure students transfer ICT strategies to other subjects, because of a lack of coordination between teachers. Although students use informatics subject to work around other subjects, informatics teachers often don't really know if these tasks are finally applied to it or are just done for informatics. Instead of this, there are some students who apply informatics to other subjects and sometimes teachers from other subjects give some feed-back to informatics ones. b) The implications ICT have for the students' life is not treated in the ESO, because teachers have the view that, for young students, ICT aren't really 'new', simple 'technologies, as they have born close to it. c) Main problems identified were: - Lack of innovative motivation by teachers. Most teachers don't really know how to use ICT, so they simply prefer to avoid them in their lessons. Other ones think that ICTs are very expensive and sophisticated tools that need too much care, so they are afraid to use them. - Teachers coordination. There is an important lack of coordination between teachers in general, and between informatics teachers. There in no consensus about the introduction of ICT in the school. - Classroom arrangement. Computers are arranged in a way that forces students to look at the wall as the teacher speaks. (all computers are distributed around the room and the teacher is in the middle). Now, they are planning to change the current design of the computer labs.

	- Lack of time. Informatics subject is within Technology subject, and it has only an hour/weekend.

- **OBSERVATIONAL DATA:**

The students had to elaborate a presentation in Power Point. This activity is inside the compulsory subject of Informatics (a part of Technology subject).

Subject	Informatics (compulsory subject, as a part of Technology subject)
Teacher	Raul Allende – Informatics teacher
Aims of the activity	To create images with different grades and effects
Equipment (hardware/software)	One computer room (15 computers) + 1 computer for the teacher + server + Projector.
Number of students and rate	15 (1 students per computer)
Time of the activity	1 hour
Time of the subject	One trimester course
Moment	They were in one of the last sessions of the course. They were revising what they had learned about Power Point jointly with other ICT knowledge (texts, images, internet search, etc.). They had to present it al the end of the course.
How is it used?	They use the Power Point and also the Internet to get information and images.
Role of the teacher	Guide and mate. He proposes the tasks and solves problems; moreover, he contributes along with the student.
Skills of the teacher	Expert. He tries to make literate all his students in using different programs (Power Point, Photo Shop, etc.), but also hardware terms and functions, in order that students understand the internal functions of the computer.
Role of the students	Autonomous, as they work individually. But they are also collaborators, as they help others and and give their views.
Skills and meta-skills that aims to develop	Image treatment skills, work development ability, ability to adapt the product to the audience, reflection skills, own interest development.
Assessment	Based on products. The main point is the task completion and the final product.
Innovations	Students are able to create products based on their own interests (with some teacher restrictions), and this is a high motivator factor for them to develop ICT skills. Moreover, the teacher gives to students the possibility of relating all the tasks for Informatics subject with other subjects so students can save efforts.

5) IES MARGARIDA XIRGU

This school is located in Hospitalet del Llobregat, in the outskirts of Barcelona. The socio-economic situation of the school is low-medium level. Most of the students are immigrants (high percentage of South-American students). Most of the students do not have a computer at home, which influences ICT skills development and literacy in the school.

The website of the school is: http://www.xtec.es/ies-margarida-xirgu/.

INTERVIEW DATA:

The interview and the classroom observation were with the coordinator of the technology subject.

Allocation of Contents in the curriculum	How to use text processing tools, spreadsheets, data bases, presentations, graphical design, informatics theory and linguistic issues. -> Technology subject.
Equipment (hardware/ software)	2 computer rooms with 15 computers + Proxy-WEB. Software: MS Office, Autocad, paint shop pro, autosketch, Internet, School-webpage.

Information retrieval: *a) What use was made of ICT and in which way (formally: use of search engines etc.)?* *b) How was information selected? How was its accuracy measured?* *c) How did collaboration take place? How (and with whom) were results exchanged? How were ideas exchanged?*	a) They do the basic literacy on operational level during the technology subject (divided in four years, one per course). The Informatics variable credit completes the operational literacy. In these subjects they learn how to use MS Office. When using the Internet the searches are guided and supervised by the teacher. They use all types of websites. The main website for start searching is www.google.com . Students learn different ways of searching through the net (by images, advanced search, etc.). b) The information selection criteria is given by the teachers, who decide if contents are relevant and valid. Also, as teachers follow book activities, they use links suggested in it. c) Tasks are performed per groups of two. They present assignments to the teacher. In second cycle, they also make presentations for the class in Power Point. The information exchange is mainly done in classroom, as most of the students don't have internet connexion (or even computer) at home.
Task development: *a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)* *b) How did collaboration take place? How (and with whom)were results exchanged? How were ideas exchanged?* *c) How was the presentation designed regarding the audience's needs?*	a) They do reports in text files with images included. When working contents of Technology (apart from informatics ones), they also create presentations in Power Point and drawings. The use of video, image and audio depends on each student group, as teachers state their students have real difficulties just in processing texts (most of them don't have a computer at home). b) Collaboration takes place among peers and with the teacher. They work in pairs, and sometimes also in little groups. In fact, only the secondary level makes presentations to the whole group, not the primary level. Teacher interacts as the guide, solving problems, directing the activities, and correcting the assignments. The communication is horizontal and the teacher is one of them. The information exchange is mainly done in the classroom, as most of the students don't have internet connexion at home. c) The students adapt their products to the their audience, mainly the teacher, as it isn't very common to make presentations to the whole group. So they follow the requirements and explanations given by the teacher and the book.
Assessment and feed-back	Assessment is done by analysing the products; they should correspond to the requirement, be well presented, be complete, correct, and appropriate. The observation of the progress of the students during the course is highly taken into account for the assessment, as teachers understand that students who don't have computers at home have greater difficulties. The assessment is done under a qualitative approach and continuously.
Global approach: *a) Were search strategies transferred and how? Were development strategies transferred and how?* *b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future?* *c) What were the main problems? How to solve them?*	a) Learners transfer operational skills to the other subjects mostly in the presentation of reports or assignments. But it is difficult for teachers to assess this transference in students who don't have a computer at home. b) The implications ICT have for the students life is not treated in the ESO as a subject content, although they sometimes talk about it in the context of students' questions. c) Main problems identified were: - Difference of levels in a group. The solution for that

	problem is to give more support to those students who have bigger difficulties. This often involves reducing the level and goals of the subject. - Book dependence. Teachers make an important use of the subject book, and sometimes when developing the activities the web pages suggested by the book don't exist. To prevent this, teachers review resources before developing the activity. - Student interests. Students only have interest in learning about e-mail, messenger and leisure use of informatics, but it is difficult for them to pay attention when they are asked to do a more 'formal' task.

- **OBSERVATIONAL DATA:**

The students were learning how to format a text document. This activity is inside the compulsory subject of Technology.

Subject	Technology subject (compulsory subject)
Teacher	Joaquim Sampere – Technology coordinator
Aims of the activity	To give format to different text documents.
Equipment (hardware/software)	Computer room (15 computers) + 1 computer for the teacher
Number of students and rate	15 (2 students per computer)
Time of the activity	1 hour
Time of the subject	One trimester course.
Moment	They were in one of the last sessions of the course and were learning how to give different kinds of format to texts.
How is it used?	They used the Word tools.
Role of the teacher	Guide and fellow classmate. He proposed the tasks and solved problems.
Skills of the teacher	Advanced ICT skills. He taught students in basic ICT skills. He also had skills in managing different levels between students.
Role of the students	Collaborators; they helped others and were helped. While the teacher was with one student, the others worked among themselves.
Skills and meta-skills that aims to develop	Accuracy while doing a task, processing texts.
Assessment	Based on products. The main point is the task completion and the final product. He also observed progress in class and took it into account. The teacher has to observe a lot in class in order to assess correctly.
Innovations	Anything to remark.

- **CONCLUSIONS:**

The I-curriculum proposed framework has some barriers to take into account. The implementation in the current core subjects curriculum has space to promote operational level skills, mostly. The operational ICT skills are mainly included in the core subject named "Technology",. Also, the timing constraints of the mentioned subject oblige the teachers to include digital literacy at operational level most of the time, which don't allow teachers go beyond this level.. Relating the current situation observed with the I-curriculum framework we can state then that they are working under an operational approach, with some experiences under a more cultural approach in the variable credits or inside core subjects, but by decision of individual teachers.

As an opportunity to the framework implementation, there is the possibility to decide and introduce variable credits (which are more flexible in terms of organisation of contents and timing) that allow the teachers to develop meta-skills and skills in cultural and critical levels. Thanks to the operational literacy done in the technology subject, it

is easier to develop meta-skills in other areas, either compulsory or not;. the variable credits are an interesting space and an opportunity to promote innovative activities based on the framework proposed. By implementing I-curriculum framework in the variable credits and promoting activities such as “web quests”, telematics projects, or other activities supported by ICT, we think that the approach would have opportunities to approach the cultural level.

The implementation of ICT in core subjects, such as languages, maths, nature sciences, etc. Thus, the I-curriculum framework gets meaning in the transformational approach as ICT are facilitators of learning and wholly integrated in the education curriculum.

The current core curriculum is not flexible enough as the teachers interviewed have stated. This hinders the opportunities for developing ICT-based meta-skills: teachers are pressed to complete the programme and have no time to introduce innovations.. At the end of the term the students complete an ICT competencies test provided by the local authorities; some teachers have stated their concern on the difficulty that the students have on successfully complete tasks relatively easy, such as creating folders, saving files, etc. On the other hand, most of the students who have Internet access at home show command when communicating in Internet, and searching in the Web.

This might cause, according to the teachers, a digital gap among students in the classroom related to their equipment at home: those who have Internet access, those who have only the computer, and those who lack any equipment; the teachers should manage this e-diversity in the classroom.

Teachers found no linguistic-based issues related to vocabulary, terminology, specific language, etc; for instance, some teachers stated that in the first course they introduce some basic vocabulary, which students learn progressively.

Among the constraints for using ICT in the classroom, teachers mentioned the following:

- divergences on the educational software used (which includes commercial products)
- not enough budget for acquiring the educational software
- the shortage of equipment
- the monitoring of the classroom when using ICT tools
- the different skill levels in the cohort of students
- lack of consensus on the assessment criteria of ICT-based learning activities
- lack of motivation for creating teams of teachers
- the classroom schedule constraints

Generally speaking, in the schools visited, teachers believe that there is a lack of ICT skills out of the technology area. However, it is noticeable, that in one of the schools visited, teachers used new ICT-based learning activities (web quest, etc) that would promote digital literacy; there are opportunities for the implementation of more advance activities (cultural and transformational) as I-Curriculum promotes, beyond the day-to-day constraints of the curriculum and the mainstream school practice.

Appendix A: Data synthesis matrix

This matrix presents the data provided by both methods and aims to show relevant aspects of uploading the I-curriculum framework. In italics are the items proposed by the UK; the other items come from the German instrument.

In brackets you will find the number of schools in each item that correspond to the level and section in which it appears.

	Transformational	Integrating	Operational
Exchanging and sharing information; Communication and collaboration			
- *Do you teach this aspect?* - *How do you evaluate and assess this aspect?* - *Are you required to teach this aspect by school, regional, or national requirements?* - *What are your aspirations to teach this aspect?* - *Does student learning in these areas transfer to their other learning, classes, subject, etc***?**	There are public product editions on the school websites to promote quality products and learn the importance of creating quality, multimodal, rich, and useful products trying to present the contents adapted to the audience (1)	Apart from the national curriculum, there are some variable credits that try to give skills to students in order that they can improve in producing other assignments and for their future life. (5) Although there is exchange in presenting a report or tasks to the teachers, the students have to present their product in a classroom presentation and publish their final product on the school website. (1)	Uses are embedded in curricular action within the Technology subject (5) Communication and exchange is mostly done presenting assignments to the teachers. There is not a real exchange planned but some students do it on their own. (4) The collaboration is mainly among peers. They work in pairs and the teacher interacts as a guide. (4) The collaboration is among peers and they help each other when required. The work is individually planned and teacher is a guide. (1)
Researching: Finding things out			
4. In the information retrieval phase of the project: a) What use was made of ICT and in which way (formally: use of search engines etc.)? b) How was information selected? How its accuracy measured?			Searches are guided and the criteria for searching are given by the teachers. Most of the times they use www.google.es or other websites related with the Catalan educational authorities or services. (5) To measure if the search has followed the criteria established, the teachers assess the products (5).
Developing ideas and making things happen			
1. Could you in brief describe the project's content? 2. How was it organised (relating to its internal formal organisation: forms of researching, information exchange, presentation etc.)? 5. For the development phase of the project: a) What use was made of ICT and in which way (formally: use of graphical software, cutting (in case of films), etc.)? How were ideas exchanged? c) How was the presentation designed regarding the	The products are rich multimodal products of different types depending on the type of variable credit that students are following. They use the Web to search for contents, images, audio, etc. and create original products adapted to the audience to be published. Thus, they can realise the importance of appropriate searches depending on the concrete needs and the time available (1)	To know how to use image, web or/and film designs supported by computer to work on contents or interests (3) To reflect on transversal issues within the use of ICT as facilitators of knowledge building (1)	To Know how to use the tools – text processor, spreadsheets, data bases, drawing, image treatment – within the technology core subject (5) The products are text reports (combining images if the students want if they are working with image creation software) to be reviewed by the teacher (4)

	Transformational	Integrating	Operational
audience's needs?			
Working practices and attitudes			
6. The project as a whole: a) Were search strategies transferred and how? b) Were experiences and views on ICT exchanged? How and with what effect? Did the project lead to reflection on the role of technology now and in the future? c) What were the main problems? How to solve them?			Problems encountered: What kind of software is used for education (1), control when using ICT in class (1), difference of levels in a same group (3), assessment criteria (1), difficulties to motivate teachers to use ICT (5), lack of organization (1) and infrastructural problems (2). These problems affect all the levels. Whether tudents have a computer or computer plus internet access at home creates different skill levels among them. This difference increase year after year. (5) Percentage of immigrants is not a problem when using ICT in class – only when this relates to having a computer at home or not (5) There is no reflection on ICT effects for life in the ESO level -in Baccalaureate yes- (5)