Competency frameworks for the use of ICT at School: from the ISO IEC 19796-1 Standard to the Unesco ICT-CST Italian localization

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Abstract

Which are the concrete competencies for the third millennium teacher invested with the hard mission of educating the 21st century citizens? The present article features the main international frameworks on teachers' ICT (Information and Communication Technologies) competencies. These frameworks have been analyzed from a procedural point of view; the procedures considered are the ones which characterise the Instructional design process as described by the ISO IEC 19796-1 standard.
The main focus of the article is on the framework developed by Unesco with the ICT-CFT (ICT – Competencies Framework for Teachers) project; we also discuss how the variety of competencies identified by the international frameworks may be brought back to the UNESCO framework.

1 Teachers' ICT competencies

There is a number of international experiences that have put their attention to the development of an ICT competencies profile for teachers and educators. It is more and more evident that these professional figures have to use ICT tools in their everyday didactic in order to improve both their teaching and the learning of their students. The competencies frameworks proposed in the present article are: the E-learning Competency Framework for Trainers and Teachers developed by the EifEL Foundation (European Institute for e-Learning), the professional profile designed by EUCIP (European Certification of Informatics Professionals) for the IT Trainer, the Competency Framework for e-Learning Designers & Developers and the Competency Framework for e-Tutor developed by the Institute of IT Training (IITT). These frameworks lay out the ICT competencies according to a procedural point of view, the same considered by the ISO IEC 19796-1 standard. The ISO documents identify the following as the macro-processes that interest the Instructional design activity: Needs Analysis, Framework Analysis, Conception/Design, Development/Production, Implementation, Learning Process, Evaluation/Optimization.

In the following we discuss a first research result in order to point out which elements of the frameworks taken into consideration are coherent with the ISO processes.

Needs Analysis

In this article we refer to a unique process named "Needs Analysis" putting under this the two ISO processes "Needs Analysis" and "Framework Analysis".

The Needs Analysis process outlined by the ISO standard matches some of the competencies outlined in the Key Area A of the EIfEL Foundation framework; in particular in the processes "Provide guidance to learners and staff for the effective use of KILT", "Prepare participants for the learning event" or in the Key area E, "Promote accessibility for learners".

The EUCIP IT Trainer profile refers to the Needs Analysis phase in the chapter "Training Needs Analysis" and in the chapter "Health and safety".

The British Institute of IT Training (IITT) refers to this moment of the Instructional design activity when it describes the competencies due for the processes: "Task Analysis", "Training Needs Analysis".

Conception/(Learning)Design

The Conception/Design process outlined by the ISO standard matches the Key Area A, "Prepare a learning event" of the EIfEL Foundation framework;

in particular the processes "Provide guidance to learners and staff for the effective use of KILT", "Prepare participants for the learning event" and "Design learning programmes".

The EUCIP IT Trainer competencies profile considers the design phase in the chapters "Training Programme Design" and "Incisive competence level" – paragraphs "Managing business change" and "Project Management essentials".

The IITT considers the design phase: 1) in the chapters "Develop Overall Instructional Strategy", "Develop Strategies to meet Learning Objectives", "Prepare Design Document", "Prepare Project Plan" of the Competency Framework for e-Learning Designers & Developer, s and 2) in the chapters "Plan how e-tutoring will be employed" and "Establish the technical facilities necessary to support e-tutoring" of the Competency Framework for e-Tutors.

Development and Production

We grouped together two ISO processes, precisely the "Development" and "Production" processes. EifEL refers to these two processes in the Key Area A: "Design learning programmes", "Develop KILT- based learning resources" and "Select and implement learning resources".

The EUCIP IT Trainer profile refers to this moment of the Instructional Design activity in the chapter "Incisive competence level" – paragraphs "Image editing", "Multimedia editing", "Writing technical documentation and procedures".

In its Competency Framework for e-Learning Designers & Developers IITT identifies six phases with references to the Development & Implementation process: "Develop technical specification", "Prepare course content", "Develop user interface", "Assemble script", "Prepare media elements", "Prepare software modules" and "Integrate components".

Learning Process

The process named "Learning Process" by the ISO IEC 19796-1 standard, refers to the phase of course delivery.

The EifEL framework refers to this process with the Key Area B "Run a learning event" and the Key Area C "Support learners".

EUCIP labels this process as "Training Delivery", from the course introduction to the management of the learning setting, passing through the learners scaffolding process.

IITT considers this phase of the learning process in the "Competency Framework for e-Tutors", where the e-tutor's competencies are outlined: "Establish

relationships with new learners", "Communicate appropriately with learners", "Provide administrative support", "Provide learners with technical and subject matter expertise", "Initiate activities that will facilitate learning", "Provide learners with support and encouragement", "Use Web pages for communication with and between learners", "Use e-mail for communication with learners", "Use bulletin boards and discussion forums for communication with and between learners", "Use text, audio and video conferencing for communication with and between learners".

Evaluation

The ISO IEC 19796-1 standard labels the evaluation phase "Evaluation/ Optimization": the reason is that in this process are comprised both the assessment of learners and the evaluation of the course in itself.

The EifEL framework refers to this process with the Key Area D "Assess learner progress" and Key Area F "Evaluating learning programmes".

EUCIP considers this processo in the chapters "Knowledge and skills assessments" and "Training evaluation".

IITT, in the Competency Framework for e-Tutors considers this process in the chapters "Assess learners' performance" and "Evaluate and continuously improve e-tutoring support".

Cross-sectional competencies

Some competencies described by the various frameworks looks as cross-sectional respect the ISO IEC 19796-1 standard.

For example, the EifEL Key Area E comprises competencies related both to the Needs Analysis process and to the Deploy and Evaluation processes.

2 More competencies frameworks

It's possible to find in literature other frameworks outlining ICT teachers competencies: the BECTA Self Review Framework, developed by Becta, the british agency for the innovative use of technologies in teaching; the FREMA eLearning Framework for Education and Research developed by a number of actors such the british Joint Information Systems Committee (JISC), the australian education Department, the New Zeland MOE, the Netherlands SURF Foundation; the Common European Framework for Teachers' Professional Profile in ICT for Education developend within the european uTeacher project.

3 The concept of competence in the Unesco ICT-Competency Standards for Teachers

Differently from the frameworks analysed in the previous paragraphs the framework designed by Unesco is composed by a series of "modules" and not by a list of one-dimensional competencies. The modules outlined by Unesco describe in a bi-dimensional way competencies and skills of the teachers. The two dimensions are: 1) the different approaches for ICT integration in education and 2) the components and the protagonists of the educational process.

The result of this project is a matrix of skill sets which allows to analyse the different competencies according to 1) the strategic goal of the teacher or to 2) the components of the educational process (which can partially overlap the processes described by the Standard ISO).

The three different approaches to technologies in educational field – which correspond to the strategic objectives of usage of ICT – are recognized by Unesco as follows: "Technology Literacy"; "Knowledge Deepening" and "Knowledge creation".

The six components of the educational process outlined by Unesco are: "Policy and vision", "Curriculum and assessment", "Pedagogy", "ICT", "Organization and administration" and "Teacher professional development". By crossing the three approaches to the usage of ICT in education with the six components of the educational system, a curriculum framework is generated as it can be seen in the following chart (figure 1).

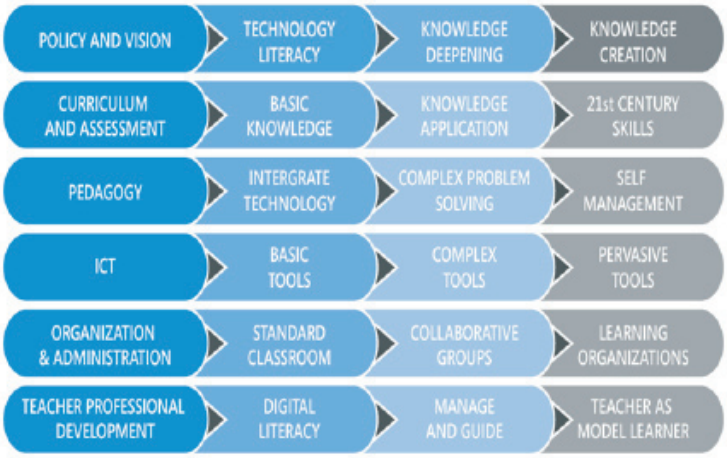

Fig.1 – Chart of the competencies described in the Unesco Standard ICT CST

Although Unesco ICT-CFT Standard doesn't follow a precise logical order

in the description of the competencies, we have found out, comparing Unesco documents with the other frameworks, that the different components of the matrix outlined by Unesco are very close to the various processes in which the other frameworks are divided into.

4 Unesco standard and instructional design process

The six components of the educational process outlined by Unesco (Policy and vision, Curriculum and assessment, Pedagogy, ICT, Organization and administration and Teacher professional development) refers – althought not explicity - to the Instructional design processes described by the ISO/IEC JTC1/SC36 standard. During the Needs Analysis phase teachers consider the elements related to the specific context and the national context (Unesco > Policy & Vision); In the Design phase teachers refer to what Unesco oulines as "Curriculum & Evaluation"; in the Development and Implementing phase teachers use the competencies described by UNESCO in the components "ICT"; during the Learning process, teachers refer to the competencies outlined by UNESCO in the component "Pedagogy". Moreover UNESCO underlines as relevant the phase of teachers updating putting this phase on the same line of the other school processes.

It is possible to use the competencies described by the frameworks previously mentioned to refine the competencies areas identified by INESCO. This framework appears as the more complete one, able to capture both the processes of the Instructional design activity, and the pedagogical goals that every teacher has when he or her decides to use ICT tools with learners.

5 Localization of UNESCO's ICT Competency Standards for Teachers

CAs it can be seen in picture 1, the authors of the Italian translation of Unesco Standard haven't decided to process a literary translation. It has been necessary to localize the whole text, written in English, in order to understand the document in his depth and to make it – as Unesco itself aims to – a tool through which teachers can analyze their competences, through which education providers can describe their syllabi, to make it the base on which the governments design their education policies. The localization process, which follows the literary translation one, consists in "rewriting" a document being aware that it has to keep its structure and specific contents, adapting the vocabulary to the different nomenclatures of the various foreign languages and to the cultural points of view to which it aims.

"Localization" is a term which is usually used in the information technology field, where it is mainly related to software or websites and to their linguistic

adaptation in order to make them suitable and understandable to the target country. Nowadays there is a new market which needs localization process, that's to say that of the multilingual e-contents for distance learning and for teacher education.

On the one hand it is necessary to localize the layout of virtual learning environment – LMS and CMS – by translating the application user interface (menus, date format, text direction on the screen) and the graphic elements; on the other hand it is very important to localize the contents. The global availability of multilingual training resources (such as Merlot) brings us to think over the concept of localization of educational and training contents. The possibility of re-using these resources depends on the possibility of the linguistic and cultural mediation that transforms the contents making them customized, thus more efficient. This is the field of work in which the authors of this paper are involved into: the translation/localization of Unesco ICT CFT Standard.

Localization and globalization seem to be complementary processes. Localization is the process through which the meaning of a text is being built: the localization process allows different users of a text– with different linguistic and cultural backgrounds – to understand and share the content with its nuances and richness. When the users act in an international context they will necessarily use the globalized language if they want to communicate, to show their understanding and their engagement in the field and to shoe the awareness of the topic they are talking about. This will only be able thanks to that previous process of localization they went through.

The localization process has been necessary in order to make the Unesco Standard an efficient and useful tool. In this phase the demand of documents aimed to an international reading public has been crucial: people need do read documents in their own mother tongues, in the national languages: the linguistic barriers quoted by Bert Esselink (Esselink, 2000) often are also psychological barriers and only a good localization of the content can allow the user to handle the documents without feeling frightened or disappointed.

The main significant phase in our team work has been the translation/localization of some particular English expressions into the Italian language, but the most difficult aspect has been the heterogeneous cultural background of the reading public: the various target groups of readers have different level of confidence with internationalisms, anglicisms and technical expressions. The translator/localizator is thus asked to choose whether to translate such expressions in the target language or not. The most challenging point is to understand which the suitable words are (sometimes single words are not enough, periphrases are needed) and to point out if they allow to transmit the proper and more suitable value of the original content.

An example is given by the English expression learning organization, which

doesn't have a corresponding Italian translation (*l'organizzazione che apprende* wouldn't mean anything): in order to allow the readers to better understand its meaning we have decided to keep the English expression in the various charts of the Unesco documents, whereas it has been necessary to unfold its meaning through a long explanation during the text (*[...] comunità di apprendimento all'interno delle classi dove gli studenti sono continuamente impegnati nella costruzione delle proprie abilità di apprendimento [...], le scuole si trasformano in learning organization volte a favorire l'apprendimento e al loro interno tutti gli attori sono coinvolti in tale processo*).

Another example is the term administration. At first it seemed that the Italian equivalent *amministrazione* could fit into the Italian text. In the localization phase, then, we realized that the English expression administration was meant to describe the setting of the classroom, of the learning tools and of laboratories, that's to say the general features that classrooms must have in order to facilitate the pedagogical integration of ICT in the teaching practice; the choice has been that of translating the expression in Italian using the periphrasis *gestione dell'ambiente didattico*.

The two examples given here show how difficult and unique each translation/localization attempt is: it is not possible to elect a coherent translation strategy and to follow it for the whole process. At the same way it is also difficult to choose whether to use internationalisms or not. Each term has to be analyzed in its original context and in the target context, for this reason it is a good practice to attach to each localization job a report aimed at motivating the strategy used during the various phases of the process, and trying to explain that every choice that has been taken is to be analyzed according to a metacognitive approach.

5 Conclusions

The Unesco Standard aims to be a framework of reference that is helpful to describe the whole set of competencies that a teacher must have in order to become an efficient 21st Century skilled teacher. The key competencies of the 21st Century rely on the ability of knowledge management through information and communication technologies and through a responsive usage of software and productivity tools.

Unesco's documents are a global framework of reference which can be used in every culture and exploited by every repertoire that will develop within the various cultures: both in a behaviouristic oriented culture and in a constructivist oriented culture the Standard will fit to their needs.

In conclusion of this papers the authors would like to introduce the EPICT (European Pedagogical ICT Licence) point of view that summarizes the main

aspect of ICT competencies for the 21st century teachers: being able to use the technologies in order to reach 1) pedagogical goals by developing – as underlined by Unesco – a high quality workforce that can face innovation and advance social and economic development and 2) educational goals by driving young people and students in general in the process of acquiring competencies of reliable, cooperative, open-minded and free of prejudices behaviour that will lead them to become responsive citizens of the global multiethnic society of the third millennium.

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LINKS

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