Improve ICT teaching in Italian teachers' education: a proposal

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Abstract

This paper starts with an historic summary of teachers' education in Italy in the last decades and point out European recommendations in the same field. In the second paragraph it analyzes TALIS data about Italian teachers' digital skills, comparing them with European countries data and with European Commission teaching models. Then the paper makes a proposal on how to improve Italian ICT teaching, suggesting a strong collaboration with best countries and universities in ICT field. The methodology proposed is the observation of other universities ICT teaching methodologies and techniques and the submission of surveys both to teachers and students. Then the collected data have to be studied and analyzed in order to propose a new, structured ICT teaching methodolgy for teachers and professional education trainers.

Keywords

ICT, theachers, digital skills

1. Theoretical framework and goals

The reflection and proposal presented in this paper are developed from the work of Pier Cesare Rivoltella about digital technologies in everyday life and in the didactical context.
Our lives are already permeated and influenced by digital technologies: they have made our lives easier, more comfortable, for example helping us organizing our time and allowing us to maintain relationships that we could not without tecnhological tools. Despite what a lot of people think, digital technologies don't replace anything, but rather they enriches our possibilities of interaction in real life situations.
This words can be referred as well to the didactic context: digital technologies, their use and integration in didactical methodologies and the use of technological tools is not proposed in order to replace the figure and role of the teacher as we know. The general debate, to which the proposal in this paper derives, wants to develop teachers' digital skills and competences to allow them being more flexible in their everyday work in the classroom and to overcome the idea of a fixed school in place and time in favor of a flexible organization that can provide personalized methodologies for each student.

The goal of this paper is to propose a strong reflection about Italian's ICT teaching framework and to stimulate the quest of a national, integrate solution to the low standards of teachers' digital skills.
This quest can be the beginning of a necessary renewal process at the national level in ICT learning processes for future teachers and education trainers.
Achieving these objects can mean not only a scientific leading role to its territory to Foggia University, but it can also help to consolidate the growth path of Foggia University at a national level, especially in ICT and new tecnhologies.

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2. Italian teachers' education: an historical frame

In Italy the academic education for teachers of kindergarten, primary and middle school became mandatory in the 90s through the creation of the degree course in *Scienze della formazione primaria* (Primary Education Science, SFP) [1, 2].

Meanwhile the Higher Education for high school teachers became mandatory as well through the establishment of the *Scuola di Specializzazione all'Insegnamento Secondario* (Advanced Institute for Secondary Studies, SSIS) [1, 2]; since A.A. 2011/2012 the SSIS was replaced by the *Tirocinio Formativo Attivo* (Active Training Internship, TFA) [3, 4] and then by the *Formazione Iniziale e Tirocinio* (Initial Training and Internship, FIT) which was abolished by 2019 Financial Law [5, 6].

The main goal of all these formation courses was to train teachers and to let them acquire specific professional skills, especially didactic methodologies and techniques, in order to help students to achieve the specific learning results planned in the Italian set of rules. In the text of *Decreto Ministeriale* (Ministerial Decree) 249/2010 [4] it was also made clear that teachers have to achieve some additional objectives: linguistic competences (english level B2 at least), inclusive teaching competences and digital skills .

The Italian Government decided to flank these starting skills (to be achieved before the beginning of their working activity) with a permanent and structured update course for licensed teachers (law "Buona Scuola", L. 107/2015, c. 124 [5]) to enhance the quality of Italian educational system and to aligne it to the best European countries' standards.

2.1 Recommendations from European Community

The European Community made clear the importance of learning ICT [7] which integrated the digital skills among the Key Competences for life long learning (2008) [8], recommending their critic and responsable use, to help teachers to evalue ICT opportunities but also limits, deficiencies and risks.
The main aim of this approach is that teachers have to become digitally skilled and learn how to master the ICT in order to guide their students in the achievement of competences and knowledges.

Key Competences were updated in 2018 [9 new] with a Council recommendation. As written in the recommendation, the principles are the strong interrelation among formal, non-formal and informal learning and the introduction of new and innovative teaching and learning methodoogies [9] to achieve the best didactic experience both for teachers and students.

There is a profound change in the meaning of digital competence, which is divided into media literacy and information and data literacy, with a great enrichment of abilities linked to this competence [10].

3. State of art of teachers' digital skills: a comparison between Italy and Europe

A lot of Italian and international studies identified as a critical point that often, in Italy, tecnhological devices (such as tablets, computers, interactive whiteboards etc.) applied to teaching methods are considered only as support to a traditional pedagogical teaching model by teachers. This teaching model are also characterized with a great distance and asymmetry between teachers and students and a top-down style in transmission of knowledge [11, 12, 13].

It is underlined from various sides that Italian education in ICT field is structured in a way that doesn't allow teachers to fully understand the potentialities of digital instruments. This happens in ICT educational courses both before and after future teachers begin their working careers [14, 15].
Indeed the courses often show softwares and technologies only through written presentations to future teachers. These presentations just describe theoretically the way in which softwares and technologies work, framing them in a closed scheme rather than putting them into a practical context, in which the future teachers can test by themselves how to use these instruments [16, 17].

Of course according to European Key Competences of life long learning there is more than learning how to use softwares and technological tools.
Digital competence means be deeple aware about the general principles, mechanisms and logic that underlie the evolutioning digital technologies.
This is very important, because in this way teachers can allow their students to achieve a full comprehension of digital technologies, their development and even the risks connected in using them, which goes further than being able to use digital devices.

3.1 TALIS 2018 data

The OECD Teaching and Learning International Survey (TALIS) 2018 [18] observed that 47% of Italian teachers let their students use often or always ICT for class projects (OECD average is 53%), but only the 36% felt prepared to use ICT during their lessons at the end of their University education.

Notwithstanding the 68% of teachers attended professional development activities during the 12 months previous the survey - which included using ICT in teaching - 17% among them identified ICT as the the field in thei professional skills set they need to enhance the most [18].

An average of 31% of Italian school principals stated that the lack and inadequacy of educational digital technologies in their schools prevent the supply of higher quality education to the students (OECD average is 25%) [18].

It is clear the presence of a mental and practical barrier against ICT [19] that compromises in an extremely relevant way the possibility of a higher level of education for Italian students, who are consequently affected by the critical issues found in their teachers' educational courses.

Teachers' formation needs are often determined by the competent Minister or by schools themselves. Schools start from the single teacher's perceveid needs and then decide to turn to one of the various Italian institutions which run refresher courses for teachers, such as Universities, training agencies or organisations approved by *Ministero dell'Istruzione, dell'Università e della Ricerca* (Minister of Education, University and Research, MIUR).

Teachers themselves think that their most needed skill is education in ICT practical use and tecniques [20], theorised, for example, in Mishra and Koehler's TPACK model [21]. In this model, the knowledge of single disciplines content and didactic pedagogical methodologies are supported by *technological knowledge*, which is intended as knowledge of technologies in technical mastery way - and mostly as new media processes and languages comprehension.

3.2 Digital Competence Framework for Educators

It is worth to mention the job developed by the Joint Research Center (JRC) in 2017 for the European Community, which published the Digital Competence Framework for Educators (DigCompEdu) [22], in which are identified the educators' required competences to effectively complete technologies in the profession.

The 22 basic competences stated from DigCompEdu are collected into 6 topics. In every topic there is the essential presence of ICT new technologies to achieve the final goal: to facilitate the students' acquisition of digital skills.

DigCompEdu underlines how digital competences are acquired, according to the progressive model of skills development in using the ICT, characterized by six levels of learning (from A1 to C2): A1 is *awarness*, that corresponds to a basic use of technologies in setting lessons, communications and basic administrative aspects; A2 is *using*, where teachers become more aware in exploring ICT possible uses, even to improve themselves as educators; B1 is *integration*, when teachers integrate technologies even in creative ways and in various contexts of their professional activities; B2 is *competence*, where experienced educators add criticism in using the very instruments of ICT practises.

The last two levels are C1 *leadership* and C2 *innovation*, that are reached by leader educators and pioneers, who use the ICT in their everyday work routine and in a wide range of educative situations. They can get good to the point of project and experiment new and innovative instruments and pedagogical models themselves.

4. How to improve Italian teachers' ICT skills. A proposal

After this comparative analysis, a consideration is necessary. If the Italian higher education courses for teachers don't change, teachers won't be able to improve their own digital skills and consequently those of their students.

4.1 Research

This paper would suggest, first of all, the research and observation of virtuous examples among the ICT teaching excellences in European Universities, and then to identify the best practises in teachers (in general,

educational trainers) ICT learning among them. The research should especially focus on Scandinavian [13, 23] and Anglosaxons Countries, which are European leaders in digitization of society [24, 25]: according to 2019 Digital Economy and Society Index (DESI) [26] Finland, Sweden, Danmark, Ireland and United Kingdom are in the European Countries top 10 in digitization of society (Italy is fourth to last).

When these best practises are found, they should be observed *on field* to study the methodologies applied, especially through the *shadowing* tecnhique. The degree of satisfaction of the students is a crucial fact to find out which are the best practises. It can be inferred by submitting interviews and surveys both to expert formators and the teachers who attend the courses, along with ex ante and ex post self evaluation tests.

4.2 Data analysis and implementation

The data collected from this study should then be contextualized and adapted to the Italian educational and social system in general, and especially to the context in which the Foggia University is and works. Foggia University is the perfect subject to accomplish this task, because it is avant-garde in studies and experiences connected to ICT use in teaching/learning processes [27, 28]. Looking at its size and innovation attitudes, it is the ideal laboratory to identify and implement new ICT teaching methodologies which aim to aligne teachers' digital skills to European standards.

The data collected will subsequently be reworked through qualitative and quantitative analyses, in order to design and build a structured teaching model in ICT field for future teachers and professional educators.
The model should be characterized by *learning by doing* and *self doing learning* methods, already experimented in University of Foggia [29]

The model should therefore be implemented and tested in Foggia University educational offer, with ex ante and ex post evalutation and self evaluation test of the future teachers' competences, in order to verify the acquisition of new competences and to evaluate their entity.

5. Conclusion

The debate about new technologies in the didactic field is more concentrated about learning environments and dynamics rather than the developed digital society in which the students live in and the development of the role of the teacher.
The academic world should focus on the students' needs rather than what the teachers feel to need in order to be not left behind in their everyday work.
This means to make an effort in rethinking the way teachers' education is proposed and provided. The teachers don't have to teach how to use digital tools to their students, who are digital natives; they should teach to be critical towards digital tools and technology, in order to give to the students the skills they need to become producers of digital contents rather than just users, or they will be cut out from the global communication [30].

The implementation of ICT teaching in teachers' education is more than just providing new skills and knowledge to future teachers, it is allowing students to become full and aware future digital citizens.

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