Chapter 19
Competence-based Education in the Italian Context: State of Affairs and Overcoming Difficulties

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19.1 Introduction

As reported in the first Italian Referencing Report to the European Qualifications Framework (ISFOL 2014), Italy has officially adopted the definitions of *knowledge*, *skills* and *competence* given by the EU Commission in the context of the European Qualifications Framework:

- 'Knowledge' means the outcome of the assimilation of information through learning.
- Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is described as theoretical and/or factual.
- 'Skills' means the ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- 'Competence' means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. Competence is described in terms of responsibility and autonomy.

However, although the notion of 'competence' has come onto the scene in its full glory, teaching by competence is still difficult, especially in the upper secondary school. Much has changed on paper, while in class, the modifications are not so clearly observable; a fact that inevitably evokes a quote from the novel 'The

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Leopard' (*Il Gattopardo*) (Tommasi di Lampedusa 1958): 'Everything must change so that everything can remain the same'.

To present the state of the Italian situation and the national debate around the application of the competence-based education (CBE) in schools, this chapter will briefly recount the evolution that the Italian school system has gone through in the last two decades, quickly describe the current school organisation, discuss the relation between school evaluation and CBE and examine in detail how the notion of competence is formally introduced in the Italian schools. Finally, it will discuss the efforts of introducing CBE in schools, overviewing the main ideas of a recent project aimed at pushing CBE in the first 2 years of high school. Special attention will be given to the VET area.

19.2 A Short Story of the Recent Italian School System Evolution

The Italian school system legislation has undergone several changes since the turn of the millennium: in the last 15 years, Italy has been ruled by seven different governments, four of which have performed a school system reform (Berlinguer in 2000, Moratti in 2003, Gelmini in 2010 and Giannini in 2015).

Before the new millennium, the Italian school was organised in kindergarten (not compulsory), 5 years of elementary school (primary), 3 years of middle school (first level secondary school or lower secondary school) and 5 years of 'superiori' (second level secondary school or upper secondary school). Superiori were divided into Licei (*Classico* and *Scientifico*), technical institutes and professional institutes – the last two belonging to the vocational area. Licei were aimed at forming the managerial class. The state dictated compulsory programmes for each discipline and each school level.

A first radical modification happened with the D.P.R. n. 275/1999, which stated that each individual school, while respecting academic freedom and cultural pluralism, should 'design and realise educative and training interventions, adapting to different contexts and in line with the objectives of the national education system': a concept that is known as 'Autonomia Scolastica' (school autonomy). School autonomy was meant to create educational and training interventions aimed at the development of the individual. It also aspired to adapt schools to local contexts, needs and economy, while respecting some general national guidelines. The final goal was to ensure the educational success.

Every year, schools must publish their formative objectives in the 'formative plan' (*Piano dell'Offerta Formativa*, POF), and every decision taken in the context of autonomy must be determined during meetings of teachers board and school board. By virtue of autonomy, schools can establish agreements with universities, organisations and associations to achieve specific objectives set by the POF, temporarily exchange teachers among them, perform didactic research, introduce methodological and curricular innovation and flexibly manage teaching periods. They are also responsible for training and upgrading the school staff.

The same leftist government introduced shortly after a second important modification known as Berlinguer reform (Law n.30 2000). In an egalitarian attempt, it transformed all the technical institutes into Licei, ending up with 40 different sorts of them. At the same time, it created a bridge between primary and lower secondary. The last was reduced to 2 years, and the following 2 years were to be common for all 'Licei', elevating the compulsory education age from 14 to 15 years. The new law gave rise to a vivid discussion throughout the country. Echoes of such discussions are reported in (Fiore 2001).

The reform also adopted the Bologna Process recommendation and changed the university organisation, converting it to the European setting based on bachelor plus master and on the credit system. Previously, the universities had no notion of bachelor's degree and granted a title after a 5-year course for most disciplines, with some based on a 4-year course.

The school part of the Berlinguer reform was short lived, as soon after its approval the Italian Constitution was changed (Constitutional Law n.3 2001). In this change, regions were granted the power to legislate in the field of vocational education and training, subject to the general rules of education, in an attempt to provide a stronger link between formative effort and territorial needs. The discrepancy between the new constitutional mandate and the old centralised approach, which had persisted through the Berlinguer reform, made it unavoidable to change again the school legislation. In the meantime, there had been a government change, with a conservative alliance in power. The following Moratti reform (Law n.53 2003) undid most of what Berlinguer had done for schools while keeping intact the modification of the University system. The middle school remained articulated on 3 years (as there had been no time to apply the Berlinguer reform, it was never actually reduced to two as planned). The plethora of Licei disappeared, and they were reduced to eight branches: artistic, classic, economic, linguistic, music and dance, scientific, technological and human sciences. It was attempted to constitute an education system articulated in high schools and vocational institutions of equal dignity, having different paths, as far as curricula and methods are concerned, but converging in seeking to ensure citizens lifelong learning. The compulsory schooling was raised to 16 years, with the obligation to have some additional form of education (such as training on the job) upto 18 years.

The vocational system was aimed at achieving educational, cultural and professional profiles that were valid both in Italy and in the whole European Union. The reform obliged the state to define a common core of content, skills and competencies set by 'essential services levels' (*Livelli essenziali di prestazioni*, LEP) and by 'minimum educational standards' (*Standard Minimi Formativi*, SMF). The details were delegated to the regions, each of which has the power to organise them, with the effect to enhance the local differences that characterise Italy, where most of the south is affected by an historical and endemic underdevelopment (see e.g. Braga and Checchi 2010; Benadusi et al. 2010). Flexible and personalised educational initiatives were to be collected in a personal portfolio describing the educational, cultural and professional profile (*profilo educativo, culturale e professionale* – PECUP). The PECUP was connected with the workshops for developing, deepening and

recovering learning (*Laboratori di Approfondimento, Recupero e Sviluppo degli Apprendimenti*, LARSA). This novelty was not welcome to the labour unions, which lobbied to make the PECUP an option (Sandrone 2008).

In a short interim (2006–2008) between two conservative governments, the leftist government Prodi, with Minister Fioroni, introduced two interesting novelties: the competencies recommendation (D.M. 139 2007 – this point will be discussed in more detail later) and the test of the National Institute for the Evaluation of the Education System of Education and Training (*Istituto Nazionale per la Valutazione del Sistema Educativo di Istruzione e di Formazione*, INVALSI). The test is administrated to students at the end of the lower secondary school with the aim to compare the schools throughout the nation.

The following reform, by Minister Gelmini (D. M. 9 2010), actuated by the conservative political alliance, institutionalises 'the model of competence levels' to be compiled by class councils at the end of the compulsory schooling period and decrees its use by the regional training institutions. Also, it introduces facilities to make it easier for students to change type of school during the first two years of the second cycle.

The last reform (Law n.107 2015, 'La buona scuola', leftist government Renzi, Minister Giannini) deals with several internal organisational issues but does not modify the overall didactic system, except for the introduction of compulsory working stages in the technical and vocational institutes.

In spite of philosophical and political differences, there is an ideal continuum among these major reforms of the Italian education system, which is the attempt to find inspiration from the directives of the European council. The notion of 'competence' is taken from there, as well as the idea that the school and university system should be transnational. Certification of skills in university courses was a crucial issue the Berlinguer reform and was refined by the Moratti reform that introduced the European Credit Transfer System (ECTS) and promoted lifelong learning. The Gelmini reform takes the move from the European Qualifications Framework for lifelong learning (EU Comm 2008) and attempts to enable mobility and to make lifelong learning more palatable. Certification of competence levels becomes compulsory for both primary and secondary school, even though, as discussed later, not without problems. A detailed, critical account of the Italian reforms between 2000 and 2010 is available (Briguglio 2011), which concludes its review by saying that 'talking of competencies is still like moving on an unstable terrain'.

19.3 The Present Organisation of the Italian School System

At present, the Italian education and training system is divided into:

- Preprimary school (ages 3–5), non-compulsory, lasting 3 years;
- First cycle of education, divided into primary school (5 years) and lower secondary school (colloquially known as middle school, 3 years)

- Second cycle of education, including upper secondary school (5 years) and vocational education and training (*Istruzione e Formazione Professionale*– IeFP, 3 or 4 years)
- Higher education, made up of university education, higher level arts and music education (*Alta Formazione Artistica e Musicale* – AFAM) and higher technical education (*Istruzione Tecnica Superiore* – ITS)

Full-time education is compulsory and free for 10 years for all children between usually 6 and 16. It includes the first cycle and 2 years in the second cycle. At the end of the compulsory education, schools must compile a 'competence balance' for the pupil (more on this point later). Oddly, the end of compulsory schooling (at the end of the 10th school year) does not lead to obtain a title (titles are given at the end of the 8th and of the 13th years).

The Italian VET offering is very fragmented. In high schools, it is based on two different pillars: technical instruction and professional instruction. The first is homogeneous throughout the country and it is based on a 5-year curriculum, which ends with a final exam (*Maturità*), which gives access to university. The second is delegated to the regions, and it is structured in a first 3 years chunk ending with a qualification title. A fourth year provides a 'Diploma': after the fourth year, students who want to continue their studies have access to a specialisation year or to an integration module which enables the access to a university.

The already mentioned body called LARSA allows passing from technical instruction to professional instruction.

Students in the professional track, who decide not to continue after the end of the compulsory schooling, can fulfil their right/duty to education, which extends to the age of 18, through apprenticeship, continuous training or private training. The VET offering is completed by Higher Technical Education and Training (*Istruzione e Formazione Tecnica Superiore* – IFTS), organised by the regions, often by using European Social Fund initiatives, and post-upper secondary and post-higher education vocational training. The whole Italian formation system is described in (ISFOL 2015). The VET framework is discussed in (Nicoli 2011).

19.4 School Evaluation and the Role of Competence

As said, the school autonomy introduced wide decisional margins regarding the educational and organisational choices. The risk of autonomy is self-reference. To avoid it, it was deemed necessary to introduce monitoring and evaluation, which were based on two principles: school improvement and school accountability.

The first is based on self-evaluation, complemented with an intervention of by external experts to help the teacher team to identify, through a reflection on the obtained results and on the strengths and weaknesses, those elements that characterise the school, both positively and negatively.

The second refers to a comparative evaluation (national and international) among institutions, regions and relations between institutions and regions. The aim is to statistically detect and quantify problems and added value and to find out situations of possible danger or excellence.

This second approach was delegated to the already mentioned Italian National Service for School Evaluation (INVALSI), which runs national standardised tests that were designed to obtain data useful for local and global comparisons.

Initially, the intent was purely statistical and the tests were not aimed at testing the individuals but the collectivity. In the school years from 2003/2004 to 2006/2007, the tested disciplines were Italian, mathematics and science. The surveys were carried out at the end of the second and fourth classes of primary school, the first year of lower secondary school and the first and third of upper secondary school. Starting from 2007 to 2008, the surveys focused only on Italian and mathematics, and classes are held in the second and fifth year of primary school, the first and third of lower secondary school and second year of upper secondary school.

An important novelty was introduced in 2009 (D.L. 213 2009), when, while continuing with the global tests, the assessment of the individual student was introduced at the end of the third year of the lower secondary school and is used as part of the formal student evaluation at the end of the first cycle. This turned out to be an essential ingredient, since it makes it impossible to ignore or overlook it. The individual test, along with the Italian and math tests, asks students to complete a questionnaire with the aim to collect data on their context (personal and family study habits and attitudes towards situations in school life).

The INVALSI tests are based on multiple-choice questions and on questions requiring a textual answer (short answer, unique open answer and articulated open-ended answer). Every single test lasts less than 60 min. The tests are inspired by the International Comparative Studies (OECD-PISA – see http://www.oecd.org/pisa/, IEA-TIMSS and IEA-PIRLS – see http://www.iea.nl/home.html) and do not aim at detecting specific knowledge or skills learned in school but are rather oriented at detecting competence, i.e. to examine how the student is able to use what he has learned in school to solve new and nonroutine problems, which may be encountered in everyday life, but were probably never discussed in school in that form. This feature is essential to avoid checking the simple mnemonic notions or the mechanical repetition of procedures (which unfortunately schools do much too often).

The questions require the deployment of more or less complex reasoning skills. For being so different by the traditional school assessments, the INVALSI test does not enjoy a good reputation neither among the pupils, nor, often, among the teachers. The national press echoed these moods. Trinchero (Trinchero 2014) offers a detailed discussion of the INVALSI tests and collected the most frequent objections. The most relevant among them are the ideas that such type of evaluation:

- Belongs to the Anglo-Saxon tradition and it is foreign to the national culture
- Does not respect the local specificity, being equal on the whole national territory

- Does not take into account the multiple intelligences 'à la Gardner' Gardner (James and Gardner 1995)
- Measures the product and not the process
- Is biased by a 'luck' factor
- Is too difficult
- Can be cheated
- Pushes a teaching method that prepares to this sort of tests

Actually, the last objection is seen by Trinchero as a merit, since preparing for the test means pushing a competence-based approach that becomes an agent of change (for the better) of the Italian school.

A similar role is played by the already cited OECD-PISA. It is a well-known international comparative survey, which takes place every 3 years in order to assess to what extent students who approach the end of compulsory education have acquired some skills considered essential for an informed participation to society, as well as to continue learning in education or work. Students' age is 15, which on the Italian average corresponds to the second year of upper secondary school: the last year of compulsory education. The areas investigated are reading skills, mathematics and science. Analysing PISA results, Checchi (2004) evidenced the impact of family on students' competencies, showing that a stimulating environment is strongly correlated with better acquisition of competencies. He also showed that students in the VET system have significantly worse performance in transversal competencies than students in non-VET schools and correlates that with a self-selection process that originates from the family environment. Finally, he reports a strong competence dependence on the territory, arguing that poorer regions with a less active job market end up preparing worse students, perpetuating the economical gap among regions. It has to be noted that Checchi's results are relative to pre-2009 PISA assessments, when the participation of the regions to the test was on a voluntary basis.

Since 2009, all Italian regions have their own representative sample, unlike the previous year. Analysis performed on the 2009 test does not contradict Checchi's results. Borrione (Borrione et al. 2011) published an extensive study on the results of PISA 2009 for the Piemonte region (located in the Italian northeast, bordering with France). Apart comparing the regional results with the other Italian regions and with other countries, they analyse various components (e.g. educational vs. professional institutes, immigrants' performance, etc.). In the very interesting last section, they investigate what school-related factors affect the success of the pupils. For instance, they try to find relations between the number of teaching hours in a discipline (e.g. math) and the success in the test, with negative results. They find instead a positive relation between a stimulating cultural environment at home and good test results. The most interesting part of the analysis is the one relative to metacognition. They discover a clear correlation between positive test results and the adoption of metacognitive strategies, such as the understanding the goals of learning and controlling what has actually been learned, returning on unclear concepts. The best scoring pupils are those who do not try to *store information* or to *link content*

between them but who seek to 'check if they understood' and plan properly their own study. With respect to these findings, they quote Michel De Montaigne (De Montaigne 1899), who wants his ideal student to be 'an able man rather than a learned man'. They conclude their analysis by stating that a school that will promote success is not one that offers much content, but rather a school that teaches 'how to study', helps students to control their own learning, stimulates the pleasure and the curiosity of reading and promotes the diversity of readings and develops the inclination to explore the world around us. Also, an effective school builds a good classroom climate, which is an important prerequisite for the establishment of learning. The role of the family is important in creating a positive attitude towards study and culture and in trying to create the conditions and the right environment for learning.

Actually, the quote of De Montaigne could continue, as he stated that one should choose a tutor with a 'well-made rather than a well-filled head (…) both these qualities should be required of him, but more particularly character and understanding than learning; and he should go about his job in a novel way'. A wonderful summary stating that to prepare competent students, competent teachers are needed, who use new ways to teach.

19.5 Formal Introduction of Competence in the Italian School System

In 2006, the EU member states developed the provision of 'key competences for all' as part of their lifelong learning strategies. To this aim, 'Key competences for Lifelong Learning – A European Reference Framework' was developed and approved as Recommendation of the European Parliament and of the Council in 2006 (EU Parliament 2006). It defines the well-known set of eight key competencies and describes the essential knowledge, skills and attitudes related to each of these:

1. Communication in the mother tongue
2. Communication in foreign languages
3. Mathematical competence and basic competencies in science and technology
4. Digital competence
5. Learning to learn
6. Social and civic competencies
7. Sense of initiative and entrepreneurship
8. Cultural awareness and expression

The member states adopted the European Recommendation and introduced the notion of CBE in their legislation but often with some modifications. This is the case of the Italian legislator. The already mentioned Fioroni Ministry Decree (DM 139 2007) introduced the key competencies in the school system but with

Table 19.1 Comparison between the EU key competencies and the Italian framework

Recommendation of the European Parliament and of the Council – Dec. 2006	Italian D.M. 129, 27 Aug. 2007		
Key competencies for lifelong learning	Cultural axes	Citizenship key competencies	
Communication in the mother tongue	*Languages axis*	*Communicate*	
Communication in foreign languages			
Digital competence			
Mathematical competence and basic competencies in science and technology	*Scientific and technological axis*	*Mathematical axis*	
Social and civic competencies	*Historical axis*	*Collaborating and participating*	*Acting autonomously and responsibly*
Cultural awareness and expression			
Learning to learn		*Learning to learn*	
		Acquiring and interpreting information	
		Finding links and relationships	
Sense of initiative and entrepreneurship		*Inventing and designing*	
		Problem solving	

relevant variations. To comply with the principle of 'school autonomy', the decree provides some recommendations, but then it leaves to the schools much freedom about how to implement them.

The decree splits the competence body into two sets: 'Assi Culturali' (AC, cultural axes, defined as 'cultural dimensions') and 'Competenze Chiave di Cittadinanza' *(*CCC, citizenship key competencies). AC broadly covers four disciplinary areas: languages, science and technology, mathematics and history. Each of them is articulated in three to four key competencies. CCC comprises eight key competencies, so that the total number of competencies foreseen by the Italian law is 22 (12 + 8), against the eight of the European recommendation. Apparently, in spite of the humanistic culture that is dominating Italy, the legislator forgot the lesson by the mediaeval philosopher William of Ockham: 'Entia non sunt multiplicanda praeter necessitate' (entities must not be multiplied beyond necessity).

Table 19.1, adapted from (Zanchin 2012), attempts to map the four AC and the eight CCC against the eight EU competencies.

The underlying message is somehow odd, as it suggests that the competencies related to the cultural axes are strongly linked to a disciplinary approach and have nothing to do with the other areas, while the EU spirit is the opposite: for instance, *every* teacher should be able to evaluate the ability to communicate in the mother tongue, not only the one who teaches the local language! Hence, the Italian declination of competencies, rather than pushing for an interdisciplinary approach, reinforces disciplinary teaching.

Other notable points are that the EU version mixes math and science, while the Italian one takes them apart, and that digital competence has completely disappeared from the Italian declination. Even the wording is ambiguous, as the axis notion hides the competencies in the details, leaving them in full evidence only in the CCC. The cast of the disciplinary dimension on the competence concepts clearly assigns the AC responsibility to the corresponding disciplinary teachers, while the CCC are sort of 'nobody's child', and are perceived as ancillary and less important, even though in 1999 a proposal was discussed (but not approved), to introduce a new discipline called 'Cittadinanza e Costituzione' (Losito 1999). Such interpretation is confirmed by the already cited Gelmini reform (D.M. 9 2010), which prescribes that the (base) competencies must be certified at the end of the 10-year period of compulsory schooling: CCC are not part of this certification! Hence, the hidden message is that 'they're not really important': what really matters is the disciplinary approach. Things are even worse than that. The competence certification is a due act, but it is performed in parallel to the classical, yearly student evaluation, which is typically based on the *knowledge* acquired by the student. Competence evaluation does not have any impact on the student's career, up to the point that many schools comply with the norm, but the competence certificate is not even delivered to students and families, ending up in an archive. Most students and families do not even know that the certification exists! In such scenario, most teachers are not eager to dedicate much time to this activity, so that in the end the 16-year 'competence' balance is (almost always) nothing but a trivial mapping from the result of traditional, content-based disciplinary assessments onto the corresponding 'competence box', as could be confirmed by several anecdotal observations of such behaviours.

To reinforce the message, as if it was not clear enough, the Ministry wrote that 'competence must be anchored to the mastery of content and of the heuristic disciplinary procedures … as opposed to the thesis that abstract transversal competences (which are always only nominal) make the learning content irrelevant' (free translation from the rather convoluted reform text). It is not by chance that we quoted Tomasi di Lampedusa in the opening…

In the midst of this 'let's pretend to' setting, teachers are constantly told that they should incorporate competencies in their teaching. A decree of 2012 says, 'The EU key competencies framework is the horizon at which the Italian school system aims' (D.M. 254 2012). Written and non-written indications are vague and contradictory: those who attempt to get a deeper understanding often end up being lost and confused. Moreover, as Pelleray states (Pellerey 2010), a suitable semantic and operative framework is lacking. Teachers understand that they are requested to adapt to a new paradigm, yet they do not understand how to get there (Parmigiani et al. 2014) and often not even where is 'there'. Bottani (Bottani 2007) even mentions a 'pedagogical tsunami' caused by the big but largely incoherent amount of work done on the notion of competence.

Another Italian problem is the structure of teacher formation. After having taken a master's degree, the future teachers must go through a specific postgraduate education. The specific form of these courses has been continuously changing ever

since 1999, when the *Scuole di Specializzazione per l'Insegnamento Secondario* (Advanced School for Secondary Education – SSIS) was first introduced. They became *Tirocinio Formativo Attivo* (TFA) in 2010 and *Percorsi Abilitanti Speciali* (PAS) in 2012. Without discussing the detail of this evolution, it can be observed that they all share a bipartite structure, with some teaching of pedagogical-didactic disciplines, and still a considerable amount of subject content (as if a disciplinary Master was not enough). Such structure ensures that the identity of teachers rests, even today, more on discipline than on specific aspects of the profession. The grouping on 'disciplinary classes' is prodromal of the difficulty of dialogue that often later occurs among colleagues teaching different disciplines and of the poor attitude of the average Italian teachers especially in the upper secondary school, to cooperate and pursue the learning objectives across multiple disciplines, which is typical of competence-based teaching (Batini 2015).

The resistance to a transition to competence-based education is not uniform throughout the whole school system. In the primary school, interdisciplinary teaching is favoured by the fact that there are only two teachers per class, rather than one per discipline, and the concept of competence is not foreign for most teachers. In the lower secondary school, the INVALSI test had a clear effect of giving a motivation and a push towards teaching by competence. In the VET world, the notion and need of competence are familiar to many teachers. Where the situation is really dramatic is rest of the upper secondary school (*Licei*), where the notion of competence only enters in the mentioned 16-year balance – with all the discussed problems. An important element emerging from various focus groups run with a upper secondary school teachers groups is the fact the final exam (*Maturità*, at the end of the secondary cycle) still has an old-fashioned imprinting and is definitely not based on competence, and, in large part, it assesses the acquisition of knowledge: hence, teachers obviously feel obliged to prepare students for that. This happens even though, already in 1998 (D.P.R. n. 323 1998), the article 1 of the law about the maturity exam mentioned the word 'competence', even though its definition was not yet crisp: 'The analysis and verification of readiness of each candidate aims at determining the general and specific knowledge, competence intended as the possession of skills, also of applied nature, and the acquired logical and critical processing capacity'. Also Roger Abravanel, known for pushing meritocracy in the Italian society (Abravanel 2008), identifies a weakness in the way the maturity exam is defined and performed and invokes the introduction of an INVALSI test also at the end of the secondary cycle (Abravanel 2015).

According to the interviewed teachers, another hurdle comes from the fact that the university admission exams are essentially based on checking bare knowledge. The consequence is that it is extremely rare that teachers even think of dealing with competence in the last 3 years of high school.

A heuristic indication of these trends emerges from a search for books on the Italian site of Amazon.com. Selecting books by using the keywords 'competenze' together with 'medie' (middle school), one finds (as of August 2015) 500 titles. 'Competenze Superiori' reaches 250 hits (mostly, if not all, for the first two years) and 'Competenze Primaria' 275. Considering that the number of books per class in

the primary schools is much less that for secondary ones, this naïve indicator confirms that the 'competence' concept is much less fashionable and accepted in high schools than in primary and middle school.

Hence, several years after the explicit introduction of the notion of competence in the laws which rule the Italian school system, a change in didactical practices is hardly detectable, at least in the Italian upper secondary schools.

19.6 Competencies in the Italian VET System

In this uncertain landscape, VET is getting less fuzzy indications. The guidelines for VET education – *Linee Guida per il passaggio al Nuovo Ordinamento per Istituti Professionali* (D.P.R. 87 2010) contain a section (1.5) where there is strong and unambiguous indication that education should be competence-based. In particular, it is stated that competencies are developed while solving problems and fulfilling duties which involve practical applications of knowledge and know-how, possibly while cooperating with others. Teachers must hence be aware of this while projecting didactic activities, which should have a strong laboratorial imprinting, and should cooperate among them and with students. The recommendation proceeds dictating that teaching should in large part project-based and gives rather detailed indications about competence evaluation. The document presents then an 80-page attachment, where competence, knowledge and abilities are reported for every professional profile and every discipline of the first two years of professional schools. Along this direction is also the attempt to define on a national basis the certification of competence. To reach this goal, the government defined a national repertoire of the professional qualifications and the minimum standards for achieving the certification. The issue and its implications are discussed in (Tessaroli 2014). However, as already mentioned, after giving the general guidelines, VET education is in large part delegated to the local governments of the 20 Italian regions. The central offices (ISFOL, Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori) monitor the formative actions and produce annual reports (e.g. Bassani et al. 2015), which interestingly is also available in the form of OpenData (Bassani 2015).

However, the devolution to the regions ends up in a rather fragmented set of initiatives, generally having only local coordination. This implies that also the research in this area is far from being well established, sound and homogeneous: often initiatives and experimentations lack formal research reports and do not take the form of scientific papers. Frequently, results are presented and discussed in local thematic workshops and meetings, which do not publish proceedings in the form of papers; in many cases, only the presenters' PowerPoint slides are available. It is hence very difficult to have a global overview of the whole Italian arena. However, the following part of this section attempts to summarise some of the recently published results.

A detailed comparison among the competence models used in the Veneto region, the Italian national model and the French model is presented in (Nicoli 2012).

The comparison takes into account several dimensions. Among them are the following: how competence is defined, how close to the European model is the implementation, how competence are structured, what is their list and how they relate to content, how they are evaluated and certified, which methodology helps their introduction and what support is given to teachers. In summary, it is stated that the Veneto model is far better than the national one and that it is not too far from the French model, which is considered to be the best among the three.

A very interesting case study (Bischof et al 2012) compares a VET offering in the field of mechanical industry between Italy and Germany. Training of students of an institute in the Lombardia region and one in Sachsen (Germany) is evaluated in parallel, in a wide study. The investigation shows that better theoretical and practical competencies are achieved by students in the German system, even though there are some lights also in the Italian one.

Yet another comparison among the Italian and other European systems has been presented (Browne and Laurenti 2007). It is a much less deep work that takes into consideration the competence models in Italy (and in particular in the Piemonte region), France and Spain in the domain of the mechanical industry. The conclusion is that the three systems actually converged, thanks to the inspiring indication of EU.

The Ufficio Scolastico Regionale per la Lombardia published (USR Lombardia 2013) the output of an experimentation run over the previous few years in a school-work alternation context. The outcome is a set of methodological indications for competence-based teaching. It is presented in the form of a set of cards, which guide teachers though various phases. First, the target competencies are made explicit and then every teacher prepares his/her own teaching plan. The teaching plans for the same class are put together and reviewed by every teacher to check for overall consistency and equilibrium among disciplines. Corrections are made and another review is carried on. Teaching activity is then started and constantly monitored. Periodic adjustments and replanning are performed.

An extensive report (Careglio 2013) reviews some experimentation performed in the Regione Piemonte. The report also includes a theoretical contribution (Trinchero 2013), which deals with situated competence and gives some principles. It states that one should take into account the fact that the learning process is nonlinear, intentional, social, constructive, self-reflexive, situated and contiguous to other processes, which happen in ordinary life. Starting from this, Trinchero then establishes a template for competence evaluation. The report then gives account of about 20 good practices for competence certification, which were experimented in the field in various schools in the region, both in VET and non-VET education. Activities are described with the common structure defined by Trinchero, which includes target competencies, target students, activity description, phases and time plan, list of learning materials, expected results and evaluation grid.

A recent paper (Parmigiani et al. 2014) reviews the instructional and assessment strategies for competence development in the Italian upper secondary school. The work is performed in the Liguria region, with the involvement of 23 schools, 16 of which in VET (eight technical and eight professional institutes). The research questions were: Which didactic and evaluation strategies are deemed to be important

by teachers? Which ones are by the students? Which strategies are employed in practice? Results indicate that the strategies most used in VET are guided discussions, group work and project work. Role-play is used in professional institutes but rarely in technical ones and mostly in foreign language teaching. Non-VET schools tend to privilege metacognitive reflection. The authors report that female teachers use formative contracts more frequently than male ones. Finally, they observe that teachers are in general interested in competence-based didactic strategies but that often they have difficulties in understanding how to put them into practice.

An investigation on the PISA results limited to the 'Scuole Professionali' has been carried out by the INVALSI (Mattei et al 2009). The output of the study, which involved 21 schools in seven regions, collects and reports an extensive set of interesting analytical data but is lacking a global analysis, so that it is not clear what one can conclude from the work.

Bellini and Ravotto proposed (Bellini and Ravotto 2009) and experimented (Ravotto and Bellini 2010) the adoption of the European Certification of Informatics Professionals (EUCIP) certification programme in the Italian VET (technical and professional instruction) for the information and communication technology-related professions. EUCIP is a professional certification and competency development scheme, aimed at informatics professionals and practitioners. It consists of a core certification as well as specialised certifications for a range of competencies, which are set out in an array of job-specific profiles. It is promoted by the Council of European Professional Informatics Societies (CEPIS), a non-profit organisation seeking to improve and promote a high standard among informatics professionals in recognition of the impact that informatics has on employment, business and society.

19.7 Efforts to Facilitate the Introduction of Teaching by Competence in High Schools (In General)

A number of pedagogists are working for disseminating ideas and good practices in Italy through the publication of books, e.g. Castoldi and Martini (2011), Trinchero (2012) and (Batini 2013) and special seminars, courses or other events held in the schools.

An attempt to facilitate the introduction of teaching by competence led to a project called eSchooling (Chiozzi et al. 2014) (Ronchetti et al. 2015), which was launched in 2013 by Telecom Italia, the largest Italian telecom operator, together with three other partners: an editor (Edizioni Centro Studi Erickson SpA) and two small companies (Memetic Srl and ForTeam Srl). An interdisciplinary research team comprising pedagogical and learning theories experts, computer scientists and technologists supported the effort. The project was directed at the first two years of the upper secondary school. The target was believed to be important because it presents a formal obligation to deal with the competence notion even though the

duty often eluded, as discussed above. Moreover, while Information and Communication Technology (ICT) has been applied over the last two decades to various aspect of school life (e.g. with Learning Management Systems, Learning Object Repositories, Interactive Whiteboards, Teacher's Electronic Diaries), it seems that no relevant effort has been dedicated to using ICT to favour and support CBE, which means that there might be a business opportunity. The projects goals were to deliver deploy and experiment in schools a cloud solution to support all the actors (teachers, students, families and school managers) in the transition to and in the application of CBE.

The legislative constraints prescribe that:

1. For every class, every teacher has to prepare, at the beginning of the school year, an overall plan of what they intend to do. The plan must include the competencies they intend to develop.
2. At the end of compulsory schooling, which usually coincides with the end of second year of high school, a competence balance document has to be prepared. As already mentioned, this document is often archived even without a communication to the family.

The software, a web app living on the cloud, begins by helping the teacher to prepare the initial plan. It provides a taxonomy of competencies, starting from the European key competencies and decomposing them into lower granularity (sub-competencies). The teacher can include them in her/his plan simply by browsing the taxonomy and selecting the relevant competencies he/she intends to develop. Once this operation is done, not only the plan has been prepared but also the system has learnt the teachers' declarations. It uses them later, during the school year, to proactively remind the teachers about them and to invite them prepare activities, which typically span over several teaching hours. A wizard assists in this phase, requesting the teacher to identify sub-competencies related to the activity. Activities usually include educational resources, which can be accessed and shared over the Internet or in the eSchooling repository and generally end with an assessment. Since eSchooling knows about the sub-competencies related to the activity, it can propose rubrics, an evaluation technique especially suited for competence evaluation, e.g. (Goodrich 1996) and (Panedero and Jonsson 2013). eSchooling rubrics can be used as proposed by the system or modified by the teacher. The resulting evaluations are kept in the eSchooling databases. These data play an important role, as they can generate graphs, such as radar plots, which are shown to students for prompting metacognitive reflection, to families as a monitoring and diagnostic tool, to school directors to oversee the students performances at individual and at different aggregation levels and to monitor the adoption of CBE by the teachers, e.g. in terms of use of the number of competence evaluations tracked, activities recorded into the system, etc.

Moreover, the system can detect discording evaluations on the same competence: each competence, being transversal, can be evaluated by more than one teacher, and it may well happen that two different teachers and up with radically different evaluations. In such cases, the system can proactively solicit interaction among the

involved teachers, indicating the problem. Hence, instead of finding such discrepancies at the official overall evaluation meetings (at midyear and at the end of the school year), when it is too late, they are immediately discovered. The alerted teachers are suggested to meet and discuss the issue. This also breaks the isolation in which teachers typically work and favours cross-disciplinary cooperation.

At the time of the final competence balance, the system elaborates a 'draft proposal' based on the collected evidence. Since possible conflicts were already indicated during the year and the proposal is based on the evidence coming from all teachers, reaching consensus is, at least in principle, easier and quicker.

The eSchooling solution hence helps teachers in:

1. Defining learning objectives related to key competencies to guide their teaching
2. Planning competence teaching
3. Designing and assigning activities in the CBE spirit
4. Accessing and sharing educational resources
5. Accessing and sharing best practices
6. Performing competence evaluation
7. Cooperating with colleagues

The project is fully aligned with the final recommendations of the European project, KeyCoNet – Key Competence Network of School Education, which was released in December 2014 (Looney and Michel 2014). The most relevant of these are:

1. 'Teachers need to have clear guidelines, access to appropriate tools and materials and exemplars of effective practice'.
2. 'ICT should address both the technical and pedagogical aspects in depth. Investments in research and development as well as in identifying effective support tools will be important'.
3. Among other factors, CBE involves:
   (a) A greater emphasis on interactive learning environments, presenting learners with open-ended problems and challenges. Learners may debate and test ideas, work in teams and access online platforms for collaboration
   (b) New approaches to assessment, including classroom-based formative assessment and summative assessments that provide information on learners' understanding of interconnections and processes (rather than fragments of knowledge) or ability to perform complex tasks
   (c) Relevant use of ICT to support collaborative work, provide access to educational resources, track learner progress and assess higher-order thinking.
4. 'Teachers are often isolated in their classrooms and have few opportunities to exchange ideas and insights. Teacher networks (…) may support the development of learning communities and may also stimulate innovation'.
5. 'Qualitative and quantitative data on learner and school performance will help school leaders to identify what is working well and where adjustments may be needed'.

Also, the eSchooling approach turns out to be coherent with most of the educational design principles for CBE, as outlined by Wesselink et al. (2007) and later by Sturing et al. (2011). Some of these principles are:

1. The identification of labour market/society relevant competencies and representative (vocational) core problems, inherently often multidisciplinary, as a starting point for curriculum design
2. Monitoring competence development via ongoing assessment for example by using assessment rubrics
3. Designing and learning in authentic learning tasks both in and outside school that integrate knowledge, skills and attitudes
4. Stimulating self-reflection and responsibility for students
5. Requiring teachers to adopt a variety of teacher roles, that is, the teacher is not only a knowledge expert in a specific discipline but also a coach of student learning, and, finally, paying explicit attention to a lifelong learning attitude and stimulating learning to learn.

The project was accompanied by an experimentation intended to validate it. The experimentation had limitations, which resulted in some shortcomings, which are discussed by Mana et al. (2015), and will need to be extended to ascertain to what degree the project is actually effective in facilitating the introduction of CBE in high schools. At present, a follow-up of the project is being dedicated to VET schools which also incorporates the management of project-based learning.

19.8 Conclusions

The Italian situation is, with respect to teaching by competence, rather complex. In spite of official declarations and formal requirements, the spirit of CBE has not yet pervaded the whole school spectrum. In particular, the inheritance of a cultural system that has been, and still is, solidly anchored in disciplinary approaches with a strong separation between different disciplines, which constitute an important hurdle. The problems are bigger where the discipline separation is more marked: hence, the worse situation is the one of the last 3 years of the non-VET upper secondary schools (*Licei*). The introduction of nationwide competence-based tests having a weight in the formal evaluation of students performance at the end of the middle school has helped introducing, at least in part, CBE in the middle schools. In elementary schools, where the disciplinary fragmentation is mitigated by the presence of only two teachers, CBE is implemented in a more natural way. The same holds for vocational schools, which historically are closer to the world of work, but while being present, the competence approach is less deeply rooted in the *Licei*.

To solve the problems, it would be necessary to have a more crisp and convinced indication by the politics, which, as discussed, is often ambivalent and ambiguous on CBE. Concrete acts should imply a radical change in the ‘Maturità’ exam, which the teachers who would be prone to adopt CBE find to be a deterrent. Such change

could at least include a test similar in spirit to the INVALSI test, which is run at the end of middle school.

Also, another big obstacle is the fragmentation of teaching: in high school, it is quite common to find teachers who teach a very specific discipline and hence have only very few (e.g. two) hours per week per class. Obviously, running CBE activities in such a short time is very difficult (Grazioli 2010). Moreover, such granularity makes it very complex to put in place interdisciplinary collaboration (as the number of 'heads' grows and communication grows factorially with that number). Fragmentation has another important impact: an effective introduction of CBE would be most effective if performed by all, or at least most, teachers of the same class. Individual teachers trying to introduce CBE in isolation in their own discipline encounter resistance by colleagues and cannot use an interdisciplinary approach.

Reduction of the fragmentation would have an important enabling effect. Of course, all this is very difficult. For the time being, one must rely on 'evangelisation' of individuals (at least where the problems are less dramatic) and on projects such as eSchooling. An important role could also be played by school managers, who by making good use of the school autonomy, could push CBE. The last school reform (Giannini), which was approved in the Summer of 2015, gives managers some more power to actually direct their schools, so, at least in principle, this could be good news.

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