

## **The Use of New Technologies in Teachers' Professional Development: New Ways to Enhance Personal Capabilities?**

*Valeria Pandolfini*<sup>1</sup>

---

*Abstract:* This article aims at contributing to the debate on teachers' professional updating, focusing on the theme of teachers' training in the use of new information and communication technologies (ICTs), intended both as a classroom teaching instrument, and a form of mediation in teachers' training process, in order to determine how education, continuous training and Welfare State are actually and effectively macro-resources or positive transition factors at an individual level, and whether available resources allow developing personal capabilities, or become risk factors restraining professional growth. These aspects allow considering teachers' training in new technologies a driving element for developing their professional capabilities according to the theoretical model proposed by Amartya Sen (1984), introducing concepts like functioning, capability, resource and freedom of choice, and referring them to an empirical level through an analysis of a lifelong learning experience the Italian Ministry of Education (MIUR) proposed to the Italian teachers.

*Key words:* teachers' professional development, ICT, capability approach, lifelong learning

---

---

<sup>1</sup> Department of Anthropological Science (Di.S.A.), University of Genoa, Italy, e-mail: [Valeria.Pandolfini@unige.it](mailto:Valeria.Pandolfini@unige.it)

## **1. Teachers, Lifelong Learning and ICTs: The European and Italian Context**

The most recent literature dealing with teacher's continuous training process particularly emphasizes teachers' need to achieve "21<sup>st</sup> century skills and competencies", an expression through which national and international organizations and institutes point out the qualifications a teacher must achieve in order to properly meet the new requirements expressed by the Society of Knowledge (Midoro, 2005).

Among teachers' required "new competencies", considering the ever-growing use of information and communication technologies (ICTs) in teaching and learning processes, the ability to avail themselves of the use of multi-media technologies has become a priority (Fischer, 2003). Consequently, the new documents and guidelines issued by the European Commission<sup>2</sup> point out the need for teachers to achieve basic computer skills, ability to use the new on-line working and communication instruments, as well as advanced competencies as regards the intertwining between didactics and technologies (that is to say, related to the didactic resources available in the Web, and to the impact of ICTs on disciplines and learning processes). The main orientation being to make ICTs become not only the "tools of the trade", but also and above all, innovative and innovating methods and practices (Olimpo, 2004) aimed at improving and enhancing both the service supplied to students, and teachers' professional competencies. Therefore, new technologies are increasingly considered not only a training/educational instrument (by teaching to use them correctly), but rather an instrument through which it is possible to carry out training activities, and innovate traditional lifelong training/educational systems through an optimization of the potentialities they provide.

Basing on these assumptions, our observation field extends as far as including the wider scenario of teachers' professional updating, in which training in the sphere of technological innovation represents only one, though essential element. The importance of this matter is confirmed by the orientations expressed by the European Council of Ministers for Education which, in line with the Lisbon Strategy, has promoted the initiative

---

<sup>2</sup> Among the main projects, we wish to mention "Improving the Quality of Teacher Education" (European Commission, 2007) and "European Principles for Teacher Competences and Qualifications" (European Commission, 2005).

“Education and Training 2010” (Council of the European Union, 2003), the first purpose of which consists in improving teachers’ training (whether basic or continuous), as they are the main actors not only in managing, but also in innovating educational and training systems. Their professional updating and development is considered a “strategic lever in connection with the quality of the whole educational system” (Lisimberti, 2006, p. 72), the most important resource for the innovation and the reform of the school system (Trainito, 2000). It becomes an essential step in teachers’ development process, which allows them being more gratified by their work, and contributing more effectively to the change of the whole autonomous structure of the school (Scanagatta, 2004). The European directives have turned in Italy into institutional actions: in 2009, the Ministry of Education, University and Research (Ministero dell’Istruzione, dell’Università e della Ricerca – MIUR) proposed a new regulation concerning teachers’ basic training<sup>3</sup> (the first step of a new regulation that places the theme of lifelong training for this professional category within the frame of the wider area of the legal status of teaching), which provides for enriching new teachers’ cultural and training stock with the knowledge and practice of new technologies.

On these grounds, we should therefore reflect on the impact of ICTs on Italian teachers’ professional activity (Iard, 2008; Fondazione Giovanni Agnelli, 2009), through an in-depth examination at two levels: a micro-level, that is to say, the learning process in which teachers are involved as students, and a macro-level referring to the educational policies, which are increasingly interested by the spreading of ICTs in our society (Kastis, 2007).

## **2. Lifelong Learning in a Capability Perspective**

The themes we have previously mentioned can be investigated in the light of Sen’s capability approach (1984), a theoretical perspective based on the core idea that society should aim at enlarging individual opportunities, i.e., the freedom to promote and obtain from each member of society the

---

<sup>3</sup> “Definition of the regulations on qualifications and basic training procedures for the teaching staff of the educational and training system, under Art. 2, paragraph 136, Law N° 244, December 24<sup>th</sup>, 2007”.

highest expression in terms of “well being and doing”, and namely, in terms of quality of life and freedom of choice (Poli, 2008). This perspective assumes continuous (lifelong) training as a part of the range of “functionings” to which an individual, as well as society, can attribute a value in terms of general “well-being”, in which skills are part of a wider concept of “capability”, that is to say, competencies and skills as an enlargement of one’s horizons of opportunities (Supiot, 2001).

To understand this approach, we should refer to its key concepts. First of all, quoting Sen (1993), *functionings* “represent parts of the state of a person – in particular the various things that he or she manages to do or be in leading a life” (p. 31). Functionings are not objects detached of the person; they are doings or beings, the achievements of which are valued by the person. To evaluate the well-being of a person requires to evaluate to what extent she has achieved (or has the effective freedom to achieve) the functionings she values. The concept of *capability*, instead, “reflects the alternative combinations of *functionings* the person can achieve and from which he or she can choose a collection” (Sen, 1993, p. 31). It addresses the scope of possibilities that, in a given situation and time, a person can effectively achieve. Therefore, the distinction between *functionings* and *capabilities* is between the realized on the one hand, and the effectively possible on the other hand; in other words, between achievements and freedoms. It is also necessary to distinguish between “positive freedom” (or “freedom to/of”), or actual freedom to act and choose so as to pursue one’s fundamental objectives, and “negative freedom” (“freedom from”), or the necessary assumption of absence of obstacles, barriers or any kind of constraint (Berlin, 1969). Therefore, stressing that a good functioning consists in the actual achievement of the opportunities an individual can benefit from, compatibly with his/her level of choice (Clark, 2005), we can intend the term *functioning* whether in a positive sense, as real fulfilment of individual *capabilities*, or negatively, as non-fulfilment or impediment. For this reason, Sen (1985b) underlines that “two conceptions of freedom exist: individual control on choice and effective power to do and to be” (p. 208).

There is a variety of factors influencing the way and the extent to which a person can change resources into *capabilities*. As Salais (2002) argues, “there is no need to think of capabilities as an intrinsically individualistic notion. On the contrary, for an individual the effective possibilities are not only framed, but very often given by the institutions surrounding her” (p.

325). This concept is clearly explained by Sen (1993), according to whom “a person’s ability to achieve various valuable functionings may be greatly enhanced by public action and policy and these expansions of capability are not unimportant for freedom for that reason” (p. 44). While negative freedom is usually attributed to individual agents, positive freedom is sometimes attributed to communities, or to individuals considered primarily as members of certain communities. So, in Sen’s opinion, the exercise of individual responsibility requires positive freedom to act.

The application of these theoretical assumptions in the sphere of lifelong training demands first acknowledging that, in consequence of the changes occurred in the “new economy of knowledge” (Thurow, 2002), work can be considered today less and less a mere instrument for obtaining a wage, and more and more a form of *agency*, that is to say, an individual’s possibility to pursue and achieve his/her purposes, which is essential for determining what and how much a person can do in relation to the dimensions he/she considers important for his/her well-being (such as, for example, independence and self-determination). Work becomes then a valuable functioning for persons, in terms of real freedom of choice. Likewise, conceiving lifelong learning as an instrument aimed at increasing personal capabilities, does not limit improvements exclusively to the sphere of work but refers to the multi-dimensionality of individual experience, and extends the possibilities individuals have at their disposal to effectively pursue their well-being purposes. Knowledge becomes, in this sense, a means for exerting freedom (knowledge as something one “can have”, “can exchange” or “can share”) because it is at the base of individuals’ choice opportunities (Colombo, 2009). So, we can consider training capabilities as a part of the broader concept of learning capabilities, which means developing positive freedom in life and in work. This process follows its own dynamics throughout a person’s life and career. It includes both freedom in the labour market (for example, freedom to choose one’s job) and freedom at work (for example, professional skills and lifelong learning, Salais, 2002).

Nonetheless, the development of capabilities cannot become a merely individual “matter”, but should be effectively backed by social institutions, which are expected to calibrate and distribute rights and resources to the members of the community. This issue is a topic of discussion between the neo-liberal and the capability approach as regards individual responsibility

and the connection between work and welfare. Neo-liberals consider that each individual is responsible for the achievement of positive freedoms: everyone is free to choose whether investing or not in his/her own human capital and, in terms of public policy, employability must be a strictly individual matter. In the capability approach, instead, explicit (specific) rules and collective infrastructures are needed to make employability and responsibility effective, and to guarantee equal capabilities. Far from disregarding personal responsibilities, the capability approach intends to provide individuals with effective means to develop them, recognizing that such means should be collectively designed and provided. Real and effective freedom requires both an institutional and a material framework. The former is defined by laws and constitutions. The latter depends on the environment in which a person is living. This approach implies therefore considering the aforementioned micro- and macro- analysis levels.

“More broadly, the purpose of welfare intervention is to provide people with the necessary capability that allows them to act freely and efficiently at work. So, from a capability perspective, training might be appropriately regarded as considering the existing opportunity structures made available by the company; otherwise it is not possible to measure whether individuals are able or not to discriminate amongst different possibilities. Indeed, the issue of adaptive preferences cannot be understood without proper consideration of the effect of company training policies in shaping people's perceptions of their own beliefs with regard to opportunities on this topic” (Lambert and Vero, 2008).

These arguments lead us, ultimately, to stress the impact of educational policies (especially those connected with teachers' lifelong learning) on the general development of a country. Examining this from a more specifically economic point of view, the new theory of development (Romer, 1994) affirms that technological progress rates are not exogenous (a typical assumption of neo-classic theory) but instead depending on investments in research, development and training. The economic development of a country would strictly depend on the amount of investments made in innovation and on their spreading speed. It is interesting to apply this approach to the area of teachers' lifelong training, and in general to the Italian educational system, which are both interested, as we mentioned in the opening of this article, by the recent technological innovations. The

question to be carefully considered concerns how and to what extent technological innovation determines an increase in economic development, since according to the neo-Schumpeterian approach to change, information and communication technologies introduce to a new age (Freeman, 1987), which at the beginning may seem inconvenient due to the necessary adjustments required during the starting stages, but is surely foreboding advantages (also from an economic point of view) in the long run.

### **3. "PuntoEdu Apprendimenti di Base": teachers on the Web**

"PuntoEdu Apprendimenti di Base" is a "blended" training course<sup>4</sup>, promoted by the National Agency for School Autonomy Development (Agenzia Nazionale per lo Sviluppo dell'Autonomia Scolastica - ANSAS) in partnership with the Ministry of Education, University and Research, addressed to Italian teachers of the secondary school and of the first two years of the upper-secondary school. The training process was devised and developed to answer the deficiencies in basic learning pointed out by the PISA 2006 survey (OECD, 2007) among the Italian students in the three areas of linguistics, mathematics and sciences.

This project aims at promoting among trainees the development of a community of practice (Wenger, 1998). The learning environment becomes an educational, training, cooperation, production and testing space. One of the most innovative elements in this training method consists in that teachers are not only asked to draw up an essay or carry out an exercise, but also to participate in a real "collaborative editorial project". Trainees are asked to produce a set of materials and carry out activities reflecting the "learning-by-doing philosophy" (Aldrich, 2005). A typical characteristic of this project is the area, called "Edulab", in which trainees, after having experienced individual learning through the use of the teaching materials made available, and after having participated in social activities through an

---

<sup>4</sup> The "blended" educational/training model is characterized by the alternation of in-presence and on-line training modules. This course is structured into 12 hours of in-presence lessons, and 25 hours of on-line lessons. At the end of the course, each trainee receives a certificate of attendance reporting a student's total attended hours, without any evaluation of results, in compliance with the provisions of the regulation on teachers' updating in force.

exchange of opinions in the thematic forums<sup>5</sup>, interact within small <sup>6</sup> working groups for the fulfilment of a shared task. This kind of activity is facilitated by the presence, in the on-line learning environment, of some typical tools and instruments of e-learning, which have been developed for the purpose of promoting collaborative learning among participants (Kaye, 1992; Calvani, 2006). These tools include: *textual chat*: allows communicating in real time through the Web; *bulletin board*: a virtual area in which the coordinator can include and share information of common interest; *calender*: an instrument through which the coordinator reminds events/meetings/deadlines to be respected; *forum*: an area which gives trainees the possibility to communicate in an asynchronous way, divided into *community forum*, a socializing environment for all registered participants, in which they have the opportunity to exchange opinions, ideas, working documents, and to take part in discussions not necessarily connected with the specific educational contents of the course, and *thematic forum*, an area devoted to sharing experiences and knowledge, developing meeting opportunities on the Web, where participants can discuss themes concerning their professional and training activity; *synchronous laboratory*: an area in which trainees can work and cooperate in teams and in real time; *repository*: a database, which collects the documents produced through the cooperation on line of the members of the different working groups.

Owing to its peculiarities, "PuntoEdu Apprendimenti di Base" offers an opportunity to assess whether the access to an on-line learning environment can be considered in itself a good *functioning* (using Sen's term) by improving the learning quality, and at the same time it is capable to turn into a conversion and transition factor to other forms of personal, social and environmental forms of well-being by overcoming individual differentiations (Robyens, 2005). This implies both an analysis of the existing educational and organizational policies, and an analysis of the exercise of personal choices, showing how the institutional systems are in a position to give substance to results. These issues are investigated basing

---

<sup>5</sup> The management of the interactions developing in Edulab is entrusted to a coordinator, a role which coincides with the author of the training process of which he/she is the reference point.

<sup>6</sup> The working teams include a maximum number of 15 participants.

on the opinions expressed both by the trainees<sup>7</sup> through an on-line questionnaire and some on-line focus groups<sup>8</sup>, and by the coordinators of the forums<sup>9</sup>, through e-mail interviews.

#### **4. ICTs and Didactics: An Indissoluble Connection between Theory and Practice**

One of the aspects of PuntoEdu course teachers seem to have particularly appreciated is its usefulness in providing innovative instruments and methods capable to improve and upgrade the everyday teaching activity they carry out at school (an opinion shared by 80% of those who filled the questionnaire). This positive opinion makes us believe that in general, the expectations of most trainees have been met. The following statements explain the main reasons that led them to attend the course: “to renew my professional behaviour” (83%), “to test the use of new languages and tools in my teaching activity in the classroom” (81%), and “belief in the advantages for my work I would have drawn from it” (52%). In particular, the most favourable opinions refer to the close connection between educational contents and activities carried out by teachers in the classroom. The focus groups reveal that PuntoEdu was a course experienced in terms of *personalization and contextualization of the educational/training offer*, as these characteristics are considered particularly important in keeping the motivation to attend the course high. Moreover, respondents often underlined that, due to the fact that today, the

---

<sup>7</sup> The subjects involved in the survey are teachers of the areas of linguistics and mathematics.

<sup>8</sup> The questionnaire was filled by 42 teachers, 20 belonging to the Italian language area and 22 to the area of mathematics, out of 1,639 total attending trainees. More than 50% respondents – prevalingly women (only one respondent out of five belonging to the male gender) – is more than 50 years old (only 7.1% is less than 40 years old). The on-line focus groups, in which trainees from both areas participated, were conducted in a synchronous manner and allowed participants, equipped with earphones and microphones, taking simultaneously part in the discussion from their workstation, involving six participants (four belonging to the Italian language area and 2 to the mathematics area). Though these contributions cannot be generalized at all, they can be however used for enriching the themes dealt with in the questionnaire.

<sup>9</sup> Seven coordinators out of 17 belonging to the Italian language area, and four out of 22 belonging to the area of mathematics answered the questions sent by e-mail.

things one learns have in practice no positive, visible and perceptible impact on one's job opportunities, demotivation (and in some cases, even school drop-out) rates are undergoing an *upsurge*. The answers given by the coordinators of the forums reveal the teachers discussed the contents of the training course following a line that can be summarized by the expression "from practice to theory". Participants' sharing of real lived experiences was the prevailing input for starting discussions and opinion exchanges on the theoretical aspects of the course, and confirms the actual effectiveness of the "learning-by-doing" method and the significant advantages resulting from it. Thus, the centrality of an exchange of opinions among teachers oriented to the practical aspects of education/training, that is to say the actual "spendability" of the educational contents in everyday working activities, strongly emerges.

By offering an opportunity to put into action effective ICTs appropriation processes, so as to enable teachers making a skilled use of the available technological resources, and changing them into personal working tools, PuntoEdu points out the need to radically rethink teachers' training pedagogy and problematize the relation existing between theory and practice, an inseparable pair in today's perspective oriented to an analysis of professional development. We note, today, that the focus of attention has moved on practice and "on the development of the capabilities to read theory through the experiences of teaching" (Smith, 2003, p. 203), being aware that teachers' professional knowledge "cannot disregard its connection with practice, but, on the contrary, *in* it and *through* it, it can really develop" (Grion, 2008, p. 97). In this regard, Korthagen, Loughran and Russell (2006) oppose the two terms *phronesis* and *episteme* to explain that the theory teachers' training feeds on comes out as the result of making them aware of the characteristics of specific situations related to the context. This awareness is essential for discussing and reflecting on the way in which one has to act in a particular situation. As a consequence, the organizational context becomes also, and above all, an educational context (Lanzara and Ciborra, 1999), a sort of eco-system, which - referring to Edith Penrose's teachings - must be capable to generate the necessary intellectual resources ensuring its very survival on the market, its growth, and its successful outcomes. This approach seems particularly appropriate to a reflection on the new scenarios characterizing teachers' training to the use of new technologies in didactics, so as not to reductively identify it as

mere ICT literacy. In fact, as PuntoEdu trainees significantly pointed out, it is necessary to put theoretical knowledge in direct relation with teaching practices, in order to develop strong operating competencies and skills.

### **5. Cooperation at the Base of Practice and Learning Communities**

Another element trainees seem to have particularly appreciated was the availability of real and virtual places in which they could test and exchange cooperative practices, for the purpose of enabling teachers, after they had explained their personal pedagogic visions, to work divided into small groups to analyze authentic cases experienced as particularly problematic in the school environment, through the sharing of educational philosophies and teaching strategies to be applied in school contexts. In particular, the possibility to exchange ideas with colleagues from different regions of Italy offered all participants an opportunity to know working realities other than theirs, and to reach the awareness that the problems and difficulties they thought had affected only their personal experience were instead shared also by other realities throughout the country. This circumstance has an even greater significance if we consider that 74% respondents who filled the questionnaire had mentioned as the main reason that had led them to attend the course the opportunity “to exchange ideas and opinions on the themes and the methods of the course with colleagues belonging to different contexts”. In addition, they expressed a very favourable opinion about the “on-line collaborative groups” (70%) and about the fact that, on the whole, the atmosphere they had succeeded in establishing within the groups was “cooperative” (83%) rather than “conflicting”, and “participative” (90%<sup>10</sup>) rather than “uninterested”.

The data emerged from this inquiry allow us identifying, within the experience of PuntoEdu, the possibility to optimize the potentialities provided by multimedia to promote cooperative and learning interaction (Parmigiani, 2005), thus overcoming the time and space limits set by traditional training courses carried out in a classroom. In the case study we have examined, these peculiarities have increased, on the one hand,

---

<sup>10</sup> These per cent values result from the sum of those who, within a semantic differential scale from 1 to 9, placed themselves in the 7, 8 and 9 range.

learning/training process personalization, and have enhanced, on the other, team work through *supportive communities of learning* (Sim, 2006) aimed at promoting a reflection on the consolidated models and assumption that condition teachers' personal teaching styles. The importance of these aspects further emerges if, in agreement with Bereiter (2002), we consider modern professions as "knowledge-building communities – KBC", which live and feed on "cognitive progress mechanisms", the drive of which consists in a shared culture, which belongs to all members who consciously commit themselves to the scientific progress of the community itself. In this sense, the experience of PuntoEdu can be positively judged, since it offered teachers the opportunity to benefit from the cooperative dynamics of the group, and allowed them expressing their personal opinions about teaching, the sharing of knowledge and the acquisition of awareness of their own educational/training process (Grion and Varisco, 2007).

#### **6. The Successful Outcome of the Training Experience: The Influence of Micro- and Macro-Factors**

In confirmation of the favourable opinions highlighted in the previous pages, 62% of the sample declared they were prepared to repeat, in the future, a training activity as that experienced with PuntoEdu. Yet, we must underline two critical points of this course identified by some teachers and forum coordinators, which affect its complete effectiveness and provide some useful elements for interpreting the not fully positive levels of satisfaction expressed by trainees as regards their training experience (28% declared to be "very" and "completely satisfied", 55% "rather satisfied" and "satisfied", and 17% "scarcely" or "not at all satisfied").

The first critical element concerns the scarce ICT literacy levels of many trainees. About one fourth of those who filled the questionnaire did not consider sufficient the activities aimed at making participants familiar with the use of the instruments and tools included in the platform, and 29% expressed the opinion that on-line training demands too advanced ICT skills. For this reason, the numerous trainees who were scarcely familiar or had no experience with the use of computers, declared they had to devote a great deal of their time and energy to solve technical problems or to test functions they had only recently discovered, rather than focusing on the

training and educational contents and on an effective exchange of materials and information with the other participants. This problem clearly affected trainees' results both in terms of learning and in terms of cooperative dynamics. Trainees' difficulties are also confirmed by the answers of the forum coordinators, which underline that the scarce participation level in the asynchronous discussions may be attributed to the incapability of many teachers to include a message in the forums, in spite of the help functions made available on line and the instructions provided by the coordinators at the opening of the forums. Nonetheless, coordinators recognize at the same time, trainees' high levels of motivation and their particular willingness to "put themselves into play" in using instruments they were not accustomed to. These aspects, however, did not always succeed in solving or minimizing these problems. Some teachers who participated in the focus groups admit they resorted, at home, to the help of their children or husbands/wives, who had better computer skills, for carrying out most of the foreseen on-line activities. Therefore, many trainees complained about the lack of preparatory computer literacy courses before the beginning of the training activity: if all trainees had had sufficient computer skills, they would have used the technological tools of the platform more effectively and efficiently, and would have been able to benefit from the potential advantages connected with the use of new technologies for both learning and socialization purposes. Though strictly related to the case study we have analyzed, and therefore not enough for making generalizations, it leads us to consider the often limited knowledge the teachers of the Italian school have of ICT instruments, which obviously becomes a hindrance to effectively taking advantage of training courses totally (e-learning) or partly (blended) supplied making use of ICTs. The inquiry we have carried out, while stressing the persistent digital divide characterizing the Italian school system, points out the need to improve all interventions aimed at strengthening the computer skills of the teaching staff. In the case of PuntoEdu, the promotion, outside the project, of an a-priori acquisition of basic computer skills would have likely contributed to counter trainees' scarce ICT literacy level, thus minimizing a critical and serious problem.

These drawbacks lead us to think that, to avoid that the use of ICT electronic media excludes a high number of subjects from having access to the courses because they lack of appropriate skills (thus affecting their effective usability), it would be necessary to offer all potential users the

possibility to learn the basic activities for using a computer, bearing in mind that, to allow a successful outcome of the training process, any technical and technological barrier should be removed and become a *non-problem* (Galusha, 1997)<sup>11</sup>.

The second critical point refers to the technological equipment available in the schools in which the courses were held, which was judged in general insufficient from both a quantitative and a qualitative point of view. Many teachers think that the number of computers made available in the classrooms was insufficient, and in some cases, they complain about Internet connection difficulties and about software inadequacy. Though almost all the respondents of the sample (93%) declared to have a computer at home, the inadequacy of ICT structures at the workplace points out the need to guarantee in schools appropriate conditions enabling all participants to benefit from training actions of this kind, and first of all an improvement and upgrading of the available ICT equipment. This critical situation seems even more serious if we consider that the schools where the courses were held are the same in which the teachers, at the end of the course, should put what they have learned during the training process into practice. It is therefore very difficult to predict whether these educational contents will have a positive practical spill over effect, since these schools do not guarantee the minimum conditions (PC availability and appropriate multimedia instruments) enabling teachers to effectively test the use of new technologies in didactics.

## **7. Exploring educational capabilities: point of view of teachers and pupils**

The experience of PuntoEdu points out that the relation between technological change and professional development of the teaching staff cannot be exclusively related to the way in which teachers make use of new technologies in their teaching activity, but requires, instead, considering the possibilities (in the sense of Sen's perspective) they have to receive an appropriate training. The professional updating of the teaching staff is a

---

<sup>11</sup> These considerations recall the main results emerged from other European studies concerning teachers' ICT training: the main critical issue is the lack of teachers' digital competences (see, for example, Galanoul et al., 2004 and Pedersen et al., 2006).

complex phenomenon heavily influenced by individual, system and economic factors. At an individual level, the most relevant element emerged concerns the insufficiency of the basic computer literacy level characterizing the investigated sample.

On this point, we must consider that promoting teachers' familiarity with the use of new technologies can potentially improve both the conditions in which they work and those in which they live. On the one hand, as "the global village effect is no longer a metaphor, but represents now the condition in which many schools operate" (Margiotta, 2003, p. 91), it becomes imperative for teachers to achieve a solid competence on new information and communication technologies. On the other, this need is particularly perceived since ICT systems characterize themselves as new instruments of individual productivity, thinking, communication, sharing and cooperation (Midoro, 1999). All this, if we extend our reflections to a wider perspective, points out that the future of Internet (and its social impact) will be influenced by an appropriate political and social programme which, establishing a principle of equality in having access to digital resources, should be capable to ensure that less skilled or less technologically sophisticated citizens are not excluded from the political, economic and social opportunities increasingly provided by Internet (Di Maggio, Hargittai, Neuman, and Robinson, 2001). Lacking such a programme, the risk is that media, whether traditional or new, reproduce and stress social and cultural inequalities, giving rise to new and sharp forms of iniquity and unequal development. It is, above all, a cultural matter of "education to the new media" (Sias, 2002, pp. 138-140). In fact, a massive propaganda aimed at spreading computers and ICT equipment is not the element which can guarantee a development of its use as communication means. The acquisition of the necessary cultural competencies for using media as instruments for the production of symbols and messages, is instead the element that creates the basic prerequisite for their success and development. A political and social commitment making explicitly reference to Art. 3 of the Italian Constitution<sup>12</sup> – the need of

---

<sup>12</sup> "All citizens have equal social dignity and are equal before the law, with no distinctions of gender, race, religion, political opinions, personal and social conditions. The Republic has the task to remove any economic and social obstacle that, limiting de facto citizens' freedom and equality, prevent the full development of a human person and the actual participation of

which is particularly felt - should result from the awareness that the Web represents, today, one of the places in which individuals' sociality finds an expression, and the right of access combines with the right of all persons to social growth. Therefore, it is more and more necessary to involve individuals in an extensive and wide-ranging ICT literacy process in a position to allow each person becoming an "information literate individual" (Bruce, 1997, p. 3), that is to say, a subject who, by efficiently and effectively browsing the Web, is able to use the information he/she needs to face the problem-solving and decision-making situations encountered every day in "real life" (Behrens, 1994, p. 310). Focusing on teachers, the effectiveness of these assumptions must be further stressed, considering they take a triple value as: a) support instruments to the organization and management of teachers' professional activity, which can help them making the activities carried out outside the classroom more effective; b) support instruments to their cultural activities, since Internet offers the opportunity to find useful teaching materials, to communicate/cooperate with colleagues and experts who are not within easy reach, as well as to participate in discussions and seminars on subjects of common interest without any space limits; c) instruments capable to improve and facilitate students' learning process. Therefore, what is particularly needed today, is a massive basic computer literacy process, in the awareness that only if teachers feel at their ease in using new technologies, they will be able to effectively incorporate them in their teaching practices (Wills and Alexander, 2000). If this condition is not met, there is the risk that, though international policies and investments to promote ICTs have increased the presence of computers in the schools, and the possibilities for students and teachers to accede Internet have spread (European Commission, 2003), ICTs are not used in an effective and efficient manner (compared to the enormous potentialities they can provide) (Cuban, 2001; Kozma, 2003).

On the other hand, focusing on pupils, we would need to pay attention to which capabilities are valuable for them both at the moment, both in the future, that is enabling his/her choices and capability enlargement. Regarding the first aspect, specifically referring to the use of ICT in the classroom, we would like to underline the potential wider positive benefits of ICT on pupils, such as increasing motivation and skills, concentration,

---

all workers in the political, economic and social organization of the Country" (Art. 3, Italian Constitution).

cognitive processing, independent learning, critical thinking, teamwork and more attention during lessons, being students more involved in the learning activities. All these aspects show how the use of ICT in the learning processes represents a way to enlarge opportunities of pupils' agency and to improve their well-being. Secondly, the fact that children need to have support from parents, society or others in terms of choosing which capabilities to exercise will lead us to consider what role education can play in the capability approach (Saito, 2003, p. 26), because it might be regarded as fundamental resources enabling people and structuring the effective opportunities of people to live a life they have reason to choose and value. There is hardly any doubt that being literate, knowledgeable and "having access to an education that allows a person to flourish is generally argued to be a valuable capability" (Robeyns 2005). We need to equip children with the skills they need to reflect rationally on alternative choices about how to live, so as to enable them to make better rather than worse choices about how to live their lives now and in the future (Brighouse, 2000). In this perspective, the place of education – or more precisely of an "autonomy facilitating" form of education (Brighouse 2000) - in this context may be thus considered as expanding capabilities of people ('valuable beings and doings') and providing young people with access to positive resources that are necessary to obtain, as well as ensuring their ability to make choices that matter to them (Otto and Ziegler, 2006). As a consequence, "it seems appropriate to argue that education which plays a role in expanding the child's capabilities should be a kind of education that makes people autonomous" (Saito, 2003, p. 28).

## **8. Conclusions**

The questions we have expounded up to now provide some useful elements for problematizing some of the issues we have dealt with in the opening of this contribution, referring in particular to Sen's theoretical capability approach, and for considering the opportunity to make use of new technologies in training courses addressed to teachers and aimed at promoting their use in classroom teaching.

The case study we have examined reveals, first of all, as emerged also from recent studies carried out on a national scale (Bertagna 2003;

Scanagatta, 2004), that teachers are aware of the need to effectively combine their knowledge with today's teaching and training practices, which have been completely renewed, compared to the past, by the massive use of ICTs. This is evidenced by the fact that all respondents acknowledged the introduction of new technologies not only as an essential element aimed at modernizing the school or as a new learning area, but also as an opportunity to improve teaching styles, capable to produce potential advantages from both a personal and a professional point of view. Teachers' training to the use of new technologies cannot be exclusively technical and specialized (though necessary, considering the scarce computer literacy levels characterizing the investigated sample). It should instead determine a "change in paradigm", that is to say, a different cultural approach, by conforming technology to the person, and not vice versa (Wills and Alexander, 2000; Rogers, 2000). In this sense, the added value of PuntoEdu consists in having proposed a training process that aims at integrating the use of technology with the teaching practice, rather than a training to technology which is an end in itself or is merely oriented to technological literacy (Ferri, 2008).

The philosophy underlying the project we have examined is based on the awareness that the introduction of new technologies in the school is neither sufficient in itself for changing teachers' orientations and practices, nor for improving the quality of teaching. Therefore, to make it happen, it is necessary to radically change the current teaching methods and integrate them with a mature use of ICTs (Fondazione Giovanni Agnelli, 2010). Teachers must achieve a culture in technology use enabling them to exploit the potentialities it provides. The proposal of a training course as PuntoEdu seems therefore to meet these requirements, by offering teachers an opportunity to "put themselves to the test" with technological instruments that should be extensively used in the classroom. In addition, the adopted innovative model, which alternates in-presence and distance training, highlights significant opportunities to personalize and contextualize the training process. The possibility to download, if there is the need, training materials in a digital format, as well as the usability of the platform at any time (day and night) and from any workspace (which allowed each trainee to choose the days and the time in which carry out the foreseen activities basing on personal needs), points out the flexibility of on-line training. Furthermore, this course encourages a "group dimension,

intended as teachers' collective work" (Colombo, 2009, p. 25). The attempt to promote teachers' progressive appropriation of a shared stock of strategies, values and abilities through their participation in common educational practices is, in our opinion, one of the key elements of PuntoEdu.

Considering that teachers' training has become a key issue in educational policies as an instrument aimed at improving the quality of education, we can affirm that PuntoEdu has the potential to raise the level of the Italian educational system, as it provides a high-quality access to the Web fully complying with individual needs and freedom. However, the ability to accede an e-learning environment is not sufficient in itself to reveal which *functionings* users can achieve for improving the quality of learning. It is indeed necessary to consider that the relation existing between possessing a "good" (e.g. access to an e-learning environment) and the *functionings* to achieve certain beings and doings (e.g. achieve quality learning) is influenced by three groups of conversion factors (Robyens, 2005): 1) personal conversion factors; 2) social conversion factors; 3) environmental conversion factors. The experience of PuntoEdu is exemplificative in this regard. First of all, it emerged that only the teachers who were more familiar with technological matters – usually young subjects, as both their achieved ICT knowledge level and their age are the factors characterizing this kind of teachers – could effectively benefit from this training course and optimize ICTs use in the learning process. Secondly, the influence of factors facilitating individual transformations from a social point of view, the so-called *social conversion factors*, could clearly emerge, notwithstanding the conditions in which teachers attended the training course. We refer in particular to the quality and quantity of ICT equipment available in schools, as well as the possibility or not to connect themselves to Internet at home. All these factors should be taken into due account in planning and designing a lifelong learning course, as each of them influences teachers' capabilities to ensure good *functioning* characteristics.

Finally, we should study how the rise of a "society that builds capabilities" can be made possible, "a society in which the term 'capability' takes a meaning, which is very close to that recurring in Sen's work" (Catarsi, 2003, p. 25), thus stressing the strict relation existing between capability increase and economic development conditions. As a

consequence, people become aware of the value of the concept of freedom (Sen, 1993), since in assessing the presence or absence of progress, we should wonder “whether the freedoms human beings are enjoying are promoted”, because “the achievement of development totally depends on human beings’ free action” (Sen, 1999). The question we should then consider consists in determining to what extent teachers’ professional development succeeds in promoting innovations in the Italian education system, and consequently, in increasing the productivity of an economic and social system. This assuming that the latter depends on the ability of its “creative class” (Florida, 2002) - the teaching staff belongs to - to innovate and create new knowledge. In this sense, PuntoEdu trainees, when the course usability conditions were met, had the opportunity to benefit from the innovations brought by the use of ICTs in the teaching practice, conceiving them (à la Schumpeter) (1942), as: “process” innovations (since they determine significant changes in the adopted teaching methods); “product” innovations (as they potentially turn into an improvement of the quality of living and working of this professional category, and of the service provided to students); finally, as “organizational” innovations (as they produce new organizational behaviours, for example, greater cooperation among colleagues). This ultimately brings us back to the notion of “creative destruction” (Schumpeter, 1942), according to which the dynamics of innovation are “destructive”, as they tend to replace old typologies with new, and at the same time “creative” ones, because this process allows expanding production itself.

To conclude, bearing in mind the aforementioned improvements that should be brought, the experience of PuntoEdu shows the effectiveness of using new technologies in training courses addressed to teachers in order to achieve a double purpose. Ensuring teachers’ necessary professional updating, and increasing in general the efficiency and effectiveness of educational services, which are more and more interested by change and innovation processes resulting from an ever-growing use of multi-media technologies, with a view to the potential progress of our country, from an economic and a social point of view.

## References

- Aldrich, C. (2005). *Learning by Doing: A Comprehensive Guide to Simulations, Computer Games and Pedagogy in e-Learning and Other Educational Experiences*. New York: John Wiley and Sons.
- Behrens, S. (1994). A conceptual analysis and historical overview of information literacy. *College & Research Libraries*, 55(July), 309-322.
- Bereiter, C. (2002). *Education and Mind in the Knowledge Age*. Mahwah: Lawrence Erlbaum Associates.
- Berlin, I. (1969). *Four Essays on Liberty*. Oxford: Oxford University Press.
- Bertagna, G. (2003). Il nuovo quadro di riferimento. La formazione degli insegnanti nella scuola della riforma. *Annali della Pubblica Istruzione*, 1(2), 5-25.
- Brighouse, H. (2000). *School Choice and Social Justice*. Oxford: Oxford University Press
- Bruce, C. (1997). *The seven faces of information literacy*. Adelaide: Auslib Press.
- Calvani, A. (2006). *Reti comunità conoscenza. Costruire e gestire dinamiche collaborative*. Trento: Erickson.
- Catarsi, C. (2003). *Competenza e capacità. Doppio movimento di socializzazione*. Milano: FrancoAngeli.
- Clark, D.A. (2005). 'Sen's Capability Approach and the Many Spaces of Human Well-Being. *Journal of Development Studies*, 41(8), 1339-1368.
- Colombo, M. (Ed.) (2009). *E-learning e cambiamenti sociali. Dal competere al comprendere*. Napoli: Liguori.
- Council of the European Union, (2003). *Education and Training 2010. The success of the Lisbon Strategy hinges on urgent reforms*. COM (2003) 685 final, Brussels. Retrieved January 4, 2010, from [http://ec.europa.eu/education/policies/2010/doc/jir\\_council\\_final.pdf](http://ec.europa.eu/education/policies/2010/doc/jir_council_final.pdf)
- Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge: Harvard University Press.
- Di Maggio, P., Hargittai, E., Neuman, W.R., Robinson, J.P. (2001). Social Implications of the Internet. *Annual Review of Sociology*, 27, 307-336.
- European Commission (2003). *eLearning: Designing Tomorrow's Education*. SEC (2003) 905, Brussels. Retrieved April 10, 2010, from [http://ec.europa.eu/education/archive/elearning/doc/mid\\_term\\_report\\_en.pdf](http://ec.europa.eu/education/archive/elearning/doc/mid_term_report_en.pdf)
- European Commission (2005). *Testing Conference on the Common European Principles for Teacher Competences and Qualifications 20<sup>th</sup> – 21<sup>st</sup> June 2005*. Brussels: European Commission.
- European Commission (2007). *Communication from the Commission to the Council and the European Parliament. Improving the Quality of Teacher Education*. COM (2007), 392 final, Brussels: European Commission.
- Ferri, P. (2008). *La scuola digitale. Come le nuove tecnologie cambiano la formazione*. Milano: Mondadori.
- Fischer, L. (2003). *Sociologia della scuola*. Bologna: Il Mulino.
- Florida, R. (2002). *The Rise of the Creative Class. And How It's Transforming Work, Leisure, and Everyday Life*. New York: Basic Books.

- Fondazione Giovanni Agnelli (2009). *Rapporto sulla scuola in Italia 2010*. Roma-Bari: Laterza.
- Fondazione Giovanni Agnelli (2010). *Rapporto sulla scuola in Italia 2010*. Roma-Bari: Laterza.
- Freeman, C. (1987). *Technology Policy and Economic Performance*. London: Pinter.
- Galanouli, D., Murphy, C., Gardner, J. (2004). Teachers' perceptions of the effectiveness of ICT-competence training. *Computers and Education*, 43(1-2), 63-79.
- Galusha, J.M. (1997). Barriers to learning in distance education. *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*, 5(3-4), 6-14.
- Grión, V. (2008). *Insegnanti e formazione: realtà e prospettive*. Roma: Carocci.
- Grión, V., Varisco B. M. (2007). Online Collaboration for Building a Teacher Professional Identity. *PsychNology Journal*, 5(3), 301-313.
- Kastis, N. (2007). Observing the e-Learning phenomenon: The case of school education. Analysing the transformative innovation of e-Learning. *eLearning Papers*, 4, May.
- Kaye, A. (1992). *Collaborative Learning Through Computer Conferencing*. Berlin: Springer-Verlag.
- Korthagn, F., Loughran, J., Russell, T. (2006). Developing Fundamental Principles for Teacher Education Programs and Practices. *Teaching and Teacher Education*, 22(8), 1020-1041.
- Kozma, R. (Ed.) (2003). *Technology, innovation, and educational change: A global perspective*. Eugene, OR: International Society for Educational Technology.
- Lambert, M., Vero, J. (2008). *Identifying French capability-friendly companies from a linked employer-employee survey on Continuing vocational training*. Paper presented at the Annual Conference Human Development and Capability Association, New Delhi, India, September 11.
- Lanzara, G.F., Ciborra, C. (1999). *I labirinti dell'innovazione*. Milano: Etas Libri.
- Lisimberti, C. (2006). *L'identità professionale come progetto. Una ricerca su insegnanti e formazione*. Milano: Vita e Pensiero.
- Margiotta, U. (2003). Lavoro cognitivo: strumenti e tecniche della formazione iniziale a distanza. La formazione degli insegnanti nella scuola della riforma. *Annali della Pubblica Istruzione*, 1(2), 91-113.
- Midoro, V. (1999). Come cambiano gli insegnanti e la loro formazione. Uno scenario futuro della professione dell'insegnante. *T-D Rivista di Tecnologie Didattiche*, 18(3), 4-11.
- Midoro, V. (Ed.) (2005). *European Teachers towards the Knowledge Society*. Ortona: Menabò.
- Ocse (2007). *PISA 2006. Science Competencies for Tomorrow's World*. Paris: Ocse.
- Olimpo, G. (2004). Scuola e tecnologia: la formazione degli insegnanti. *Nuova civiltà delle macchine*, XXII, 86-99.
- Otto H.U., Ziegler, H. (2006). Capabilities and Education. *Social Work and Society*, 4(2), pp. 269-287.
- Parmigiani, D. (2005). Tecnologie di gruppo. Gestire le dinamiche relazionali veicolate dalle tecnologie ai fini dell'apprendimento. *Form@re*, 35, May/June. Retrieved January 8, 2010 from [http://www.formare.erickson.it/archivio/maggio\\_05/3\\_PARMIGIANI.html](http://www.formare.erickson.it/archivio/maggio_05/3_PARMIGIANI.html)

- Pedersen, S., Malmberg, P., Christensen, A. J., Pedersen, M., Nipper, S., & Graem, C. D. (Eds.) (2006). *E-learning Nordic 2006. Impact of ICT on education*. Copenhagen: Ramboll Management.
- Penrose, E. (1959). *The Theory of the Growth of the firm*. New York: Wiley.
- Poli, S. (2008). *La sindrome di Gondrano. Senso e significati del lavoro nella società postmoderna*. Milano: FrancoAngeli.
- Robyens, I. (2005). The Capability approach: a theoretical survey. *Journal of Human development*, 6(1), 93-117.
- Rogers, P. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research*, 22(4), 455-472.
- Romer, P. (1994). New goods, old theory, and the welfare costs of trade restrictions. *Journal of Development Economics*, 43(1), 5-38.
- Saito, M. (2003). Amartya Sen's Capability approach to Education: A critical exploration. *Journal of Philosophy of Education*, 37(1), 17-33.
- Salais, R. (2002). Work and Welfare. Towards a Capability-based approach. In J. Zeitlin & D. Trubek (Eds.), *Governing Work and Welfare in a New Economy. European and American Experiments* (pp. 317-344). Oxford: Oxford University Press.
- Salais, R., Villeneuve, R. (2005). *Europe and the Politics of Capabilities*. Cambridge: Cambridge University Press.
- Scanagatta, S. (Ed.) (2004). *Formazione insegnante. Fabbisogni formativi e sviluppo professionale degli insegnanti nel contesto della Riforma del sistema scolastico italiano*. Padova: Cooperativa Libreria Editrice, Università di Padova.
- Schumpeter, J. (1942). *Capitalism Socialism and Democracy*. New York: Harper & Brothers.
- Sen, A. (1984). *Goods and People in Resources, Values and Development*. Oxford: Blackwell.
- Sen, A. (1985a). *Commodities and Capabilities*. Amsterdam: North Holland.
- Sen, A. (1985b). Well-Being, Agency and Freedom. The Dewey Lectures 1984. *The Journal of Philosophy*, LXXXII(4), 169-221.
- Sen, A. (1992). *Inequality re-examined*. Cambridge: Harvard University Press.
- Sen, A. (1993). Capability and Well-Being. In M. Nussbaum & A. Sen (Eds.), *The Quality of Life* (pp. 30-66). Oxford: Clarendon Press.
- Sen, A. (1999). *Development as Freedom*. New York: Anchor Books.
- Sias, G. (2002). *Società dell'informazione e conoscenza. Un futuro ineguale?*. Milano: FrancoAngeli.
- Sim, C. (2006). Preparing for Professional Experiences – Incorporating Pre-service Teachers as Communities of Practice. *Teaching and Teacher Education*, 22(1), 77-83.
- Smith, K. (2003, July 29). *New Methods and Perspectives on Teacher Evaluation – Who Evaluates What and for What Purposes?*. Paper presented at the 11<sup>th</sup> Biennial Conference ISATT (International Study Association on Teachers and Teaching), Leiden, NL.
- Supiot, A. (Ed.) (2001). *Beyond Employment. Transformation of Work and the Future of Labour Law in Europe*. Oxford: Oxford University Press.
- Thurow, L. (2002). *Building wealth: new rules for individuals, companies and countries in a knowledge-based economy*. New York: Harper Business.

- Trainito, G. (2000). La formazione in servizio del personale della scuola nell'ambito del processo di riforma. *Annali della Pubblica Istruzione*, 1(2), 13-20.
- Wenger, E. (1998). *Communities of Practice: learning, meaning and identity*. Cambridge: Cambridge University Press.
- Wills, S., Alexander, S. (2000). Managing the introduction of technology in teaching and learning. In T. Evans & D. Nation (Eds.), *Changing university teaching: reflections on creating educational technologies* (pp. 56-72). London: Kogan Page.