Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva / Italian Journal of Health Education, Sports and Inclusive Didactics - Anno 5 n. 3 - ISSN 2532-3296 ISBN 978-88-6022-420-0 - luglio - settembre 2021 - CC BY-NC-ND 3.0 IT - https://doi.org/

NEW TECHNOLOGIES FOR INCLUSIVE EDUCATION

NUOVE TECNOLOGIE PER L'EDUCAZIONE INCLUSIVA

Diletta Chiusaroli
University of Cassino
diletta.chiusaroli@unicas.it

Abstract

Considerable changes on the methods of communication, as well as on the knowledge building and social interactions, are a result of innovations linked to the use of the mass media, of digital tools for information processing and on the massive diffusion of the Internet. One of the most significant technological innovations of the last few years is undeniably Internet, established thanks to the Web around the beginning of the nineties. Numerous authors have investigated the changes resulting from technological evolution and the intertwining that is generated between technological innovation and knowledge production processes is of particular relevance. A lot of research also highlights the advantages related to the use of new technologies in teaching. The features of the new technologies allow, therefore, the activation of numerous perceptual and sensory channels that can help improve the learning experience. In this regard, Teatino considers: "the new horizons opened by multimedia represent the synthesis of the characteristics on which the mechanism of motivation is triggered: novelty, attractiveness, functionality and feasibility are qualitative factors that stimulate cognitive processes" (Teatino, 2010). The fundamental aspect of multimedia communication is certainly the dynamism and multisensory involvement that digital devices are capable of conveying by allowing the creation of rich and stimulating learning environments within the teaching context. Moreover, it should be stressed how important technological innovations are for students with disabilities or with specific learning impairment. In particular, the use of assistive technologies is fundamental for pupils with disabilities: these technologies represent a very important link between the "functioning" of students and their participation in school activities, allowing to overcome those barriers (not just physical) that limit their full inclusion. In this paper we intend to analyze the main characteristics of assistive technologies and, in general, of new technologies for the purpose of school inclusion, starting from the premise that it is essential to guarantee disabled students the full development of their potential to achieve their educational success.
In this work we intend to reflect on the possible methodologies and on the multiple uses of new technologies in the creation of inclusive learning paths.

I notevoli cambiamenti sui metodi di comunicazione, così come sulla costruzione della conoscenza e le interazioni sociali, sono il risultato delle innovazioni legate all'uso dei mass media, degli strumenti digitali per il trattamento delle informazioni e della diffusione massiccia di Internet. Una delle innovazioni tecnologiche più significative degli ultimi anni è innegabilmente Internet, affermatasi grazie al Web intorno all'inizio degli anni Novanta. Numerosi autori hanno indagato i cambiamenti derivanti dall'evoluzione tecnologica e l'intreccio che si genera tra innovazione tecnologica e processi di produzione della conoscenza è di particolare rilevanza. Molte ricerche evidenziano anche i vantaggi legati all'uso delle nuove tecnologie nell'insegnamento. Le caratteristiche delle nuove tecnologie permettono, quindi, l'attivazione di numerosi canali percettivi e sensoriali che possono contribuire a migliorare l'esperienza di apprendimento. A questo proposito, Teatino considera che: "i nuovi orizzonti aperti dalla multimedialità rappresentano la sintesi delle caratteristiche su cui si innesca il meccanismo della motivazione: novità, attrattività, funzionalità e fattibilità sono fattori qualitativi che stimolano i processi cognitivi" (Teatino, 2010). L'aspetto fondamentale della comunicazione multimediale è sicuramente il dinamismo e il coinvolgimento multisensoriale che i dispositivi digitali sono in grado di trasmettere permettendo la creazione di ambienti di apprendimento ricchi e stimolanti all'interno del contesto didattico. Inoltre, va sottolineata l'importanza delle innovazioni tecnologiche per gli studenti con disabilità o con disturbi specifici dell'apprendimento. In particolare, l'uso delle tecnologie assistive è fondamentale per gli alunni con disabilità: queste tecnologie rappresentano un importantissimo anello di congiunzione tra il "funzionamento" degli studenti e la loro partecipazione alle attività scolastiche, permettendo di superare quelle barriere (non solo fisiche) che ne limitano la piena inclusione. In questo lavoro intendiamo analizzare le principali caratteristiche delle tecnologie assistive e, in generale, delle nuove tecnologie ai fini dell'inclusione scolastica, partendo dal presupposto che è fondamentale garantire agli studenti disabili il pieno sviluppo delle loro potenzialità per raggiungere il successo scolastico.
In questo lavoro si intende riflettere sulle possibili metodologie e sui molteplici usi delle nuove tecnologie nella creazione di percorsi di apprendimento inclusivi.

Keywords

Assistive Technologies, Inclusion, ICF, Situated Learning, Inclusive Education
Tecnologie assistive, inclusione, ICF, apprendimento situato, educazione inclusiva

1. Didactic and new inclusion technologies:

The article 13 of the Law n. 104 (1992) states: "Technical equipment and teaching materials are provided for the schools and Universities, beyond the individual endowment of facilities for the effective exercise for the right study, even through conventions with specialised centres, having a pedagogical function, production and adaptation of a specific teaching material" (Art. 13 p. B, L. 104/1992). It sets the use of technical aids, as an essential for people with disabilities.

The Law n.4 (2004) known as "Stanca Law", provides guidelines to facilitate the access to tools, IT services, training and teaching materials for the people with disabilities, in a digital format, in order to promote an inclusion strategy, integrating themselves into the new technologies world. Therefore, access to the use of technologies by the disabled guarantees and protects their right to study with a view to scholastic inclusion.

In ICF (International Classification of Functioning, Disability and Health), among the environmental factors taken into consideration, there are new technologies that act as a support to encourage everyone's activity and participation.

The ICF model transforms the diversity present in each student to enhance their way of learning. It is important infact, for the teachers to understand the students type of learning by analysing their needs, methods and strategies in each class. The use of technology in teaching is expanding and the access to information has become more and more unlimited. Teachers must make an effective use of this information from the web, applying new languages compared to textbooks: "languages that use multimedia, by reprocessing the informations acquired, in order to connect them together to create a personal knowledge." (Ministerial Directive 27 December 2012). The skills acquired through the use of new technologies are essential for the schools, that have an important task: place new citizens into adult society. These skills are crucial not only for the students with Special Educational Needs. The new technologies are the tools that strengthen everyone`s skills (Cottini, 2017).

The relevant and conscious use of compensatory mediators are the first step towards an autonomy. A mediator is the equivalent of a foothold. Canevaro (2008, p.8) writes: "Who wants to cross a stream of water which separates the two sides and doesn`t want to get wet: puts his feet on the stones that appear. Maybe he throws a stone to build a foothold where there is not. These supports are the so-called mediators[…]. A performace supported by facilitators and mediators, promotes potentials and ability of the student".

No matter what mediator is chosen, the fundamental is that its efficient for each person and that favours inclusion.

The advantages of working with the computer in teaching emerged over the years, as a result of studies and resources, are numerous. Compared to the printed book, the computer is a innovative device that offers a variety of activities which increase the motivation and the students participation. These tools provide interactivity, operating in the learning process intentionally and receive feedbacks that if positive, are able to trigger a significant gratification to the learner.

The acquisition of digital skills is part of the eighth key competence of citizenship: Digital competence consists in knowing how to use comfortably and critically, the informations society technologies for work, free time and for communication. This implies basic ICT skills: the use of computer in order to collect, evaluate, preserve,produce, present and exchange information and to communicate and participate in collaborative networks on the internet.

In the past, the computer used in teaching was considered as a passive learning, resulting as a loss of imagination and creativity; today this concept has been widely overcome: technology us, in group work, it would encourage a *cooperative learning*, developing social and relational skills. For students with disabilities it is essential to employ assistive technologies, enhancing the individual "functioning" and promoting participation in school activities.

The assistive technologies can help regarding the access of the computer itself (input devices), in a work management (specific software) and in communication (word-processing software). There are different categories of software: educational or didactic, special and dedicated software (Besio, 2005).

The first ones are programs designed for the teaching and learning of those students who haven`t so many problems but can be useful in the design of didactic paths, addressed to the students with disabilities; the second ones are designed for disabled students, but can be effective for those who have Special Educational Needs. The third ones are designed to allow the recovery of selected forms of disability (improve oculo-manual coordination). Each student with disabilities has different situations and the school institutions must apply targeted measures. According to Ianes (2013): "the concept of special normality is a mixed condition, tangled in a complex manner, of normality and speciality that coexist. They effect each other, one transforms the other. This concept is found in a school able to introduce a specific and targeted resources. A didactic based on this concept, is a kind of didactic that structures its educational offer in order to respond to the present heterogeneity that characterizes the classes; it aims to the scholastic inclusion in terms of skills development and functioning. In the design of inclusive paths, hardware and software tools, should be chosen carefully, according to the specific needs of each student. According to Fogarolo (2012): "technologies have to promote, increase and support all the processes of inclusion, capturing the uniqueness and entirety of the student, considering him as a child of the community which he belongs and in which he lives, i.e. family, school and social context". The assistive technologies include two characteristics: accessibility and usability.

The Ministerial Decree (8 july 2005), established the accessibility as the power of computer systems, within the limits permitted by the technological knowledge, providing services and available informations, without any kind of discrimination". Therefore, accessibility, is the realization of a product capable to facilitate the fruition and interaction of the individuals, respecting their needs and preferences, without exclusion. The purpose is to allow the use of technological tools also for people with disabilities. The principle that should be behind a product design is "design for all", taking into account of the needs of all the possible users. Usability is the ability of a product to be used in correlation to the user, to the aims and to the context. To project a product or a website, according to the usability principle, means making sure that its content and functionality becomes easily found. Accessibility and usability principles are essential to select didactic tools. The last characteristic of technological instruments is the Multimodality, i.e the opportunity to review a document in different ways, keeping the same content. Accessibility, usability and multimodality are not exclusively technical perspectives, but re-enter in a wider issue, based on the acceptance of shared citizenship values, equality rights and opportunity (Lazzari, 2017).

3.The use of technologies in long-distance didactic for students with disabilities

The need for adequate technologies in schools can be traced back to the *EU Recommendation December 18, 2006*, when the Council of Europe listed the so-called Key skills of an European student, among which figured digital competences.

Upon closer inspection, though, technologies enter the educational-training process much earlier.

Around the 1920s, the American psychologist Sidney Pressy designed "teaching machines", based on a simple technology that provides positive or negative feedback to the student, to enable him to move on to the next stage. The teaching machines he designed consisted of a very simple device, with which multiple choice questions were presented to the user. Once the student identified what for him was the right answer, he had to press the corresponding button; if the answer was correct, the machine proposed the following statement, if, on the other hand, the answer was wrong, the machine recorded the error and forced the student to proceed for subsequent choices, until he found the solution.

In 1954, the American psychologist B.F. Skinner published an article - *The science of learning and the art of teaching* - of fundamental importance in the history of educational technology, in which he emphasized the need for the introduction of teaching machines in the learning process. His *theory of reinforcement*, considered the first theory on educational technologies,

was based on the description of students' behavior. It was then superseded by cognitivism first, which included the evaluation of cognitive factors in terms of the quality of the learning process, and then by constructivism, which marked the application of many technological products to teaching, with the spread of hypermediality.

In the context of the studies conducted on the use of new digital technologies in teaching, the role that these tools play in the context of the theory of "multiple intelligences" by the American psychologist Howard Gardner (1983), is of particular interest. Gardner introduced the use of multimedia, as a way of managing the study material from different points of view, guaranteeing a personalized education with very effective tools to enhance any shortcomings related to one of the eight multiple intelligences.

It is now common ground, therefore, that educational programming, in order to be designed in the best possible way, must make use of all those favoring methods and strategies, among which a prominent place is played by IT equipment and supports, software and digital aids.

Of course, it must be understood to what extent these new means of communication and information transmission can modify traditional systems. It is not only a question of opening the school to multimedia stimuli, but also the provision of new teaching perspectives that adapt to social changes.

This is not just a technological issue, because the entry of new media diversifies and enriches teaching techniques and methods. Multimedia should be understood as a resource that stimulates people's minds and creativity, but at the same time makes the teaching organization more dynamic, networked and self-regulated on the basis of new forms of teaching and learning.

The media promote the active learning of pupils, who have the chance to test their autonomy in choosing the opportunities offered, in assessing situations and in making important decisions in terms of risks, costs and benefits. In addition, they allow you to learn using multiple perceptual and communicative channels at the same time, increasing expressive skills through multi-sensory involvement.

With the advent of new ICT (Information and communication technologies), traditional teaching based on books and oral tests, didactic technologies based on tools, media and new media have been added over time. There are five categories of tools that can be included in the didactic choices:

1) manipulative instrumentation, which, although not strictly technological in nature, is equally considered as such and includes the tools that a teacher prepares for learning, such as graphic aids, models and measuring tools;

2) audio equipment, such as CD player, recorder, radio etc;

3) video equipment, such as the IWB, tablet, video camera etc;

4) audiovisual equipment, such as television, video recorder, tablet, smartphone etc;

5) IT equipment, such as computers and tablets.

As far as software is concerned, word processing programs, programs based on managerial strategies (eg exercises), programs based on interactive strategies (eg video games), hypertextual and hypermedia programs can be used in teaching.

Telematics has opened a new line of communication that allows the student to access a dynamic knowledge that he himself deepens, making the results available to others. With interactivity, new communicative exchanges are opened between students and teachers, with new tools such as videoconferencing, discussion forums, chats, conducting exams, electronic bulletin boards, which also allow for distance learning, as the pupil is autonomous in the active construction of his own knowledge.

In this way, collaborative learning allows the material to be automatically linked to processes, even within virtual classrooms, in which the amount of information can be considerably increased, activating a multiplicity of interactions even between students of different cultural levels. In this pedagogical context, the teacher assumes the role of guide who, recalling the figure of the *teacher-director* by Jerome Bruner, one of the most important and well-known contemporary psychologists, cooperates with his students to create, together, an educational path

that respects the different learning styles; in short, a "competent adult who offers the learner a support framework for new acquisitions" (*scaffolding*) (Wood, Bruner and Ross, 1976).

We also know that technologicy promotes inclusion, in particular it is a valuable tool for people with disabilities and special needs.

The potential of new technologies to improve the quality of life, reduce social exclusion and increase participation is recognized internationally, as well as the social, economic and political barriers that the lack of access to new technologies can generate.

Law 170/2010 ensures educational institutions use compensatory tools, including alternative means of learning and information technology, for all pupils with special educational needs. They are didactic and technological tools (both hardware and software) that replace or facilitate the performance required, relieve the student from the performance made difficult by the disorder, allowing him to focus attention on the more complex cognitive tasks: the content of the performance it does not change, but improves the speed and accuracy of execution.

The fundamental objective of using new technologies in the education sector for pupils with disabilities and special needs is to promote equity in educational opportunities: *the use of new technologies is not an end in itself; rather it is a means of supporting the learning opportunities of individuals* (United Nations Organization for Education, Science and Culture, Institute for Information Technologies in Education and European Agency for the Development of Education for Disabled Pupils, 2011). Because technologies facilitate a multimedia and multichannel approach at the service of different learning styles.

In addition, they allow for active involvement and high attention and motivation on the part of pupils, spontaneously trigger cooperative and help dynamics (spontaneous or managed) and facilitate the transferability of school / home contents and materials. They also offer great possibilities for adapting materials and learning paths.

3. ESL: Episodes of situated learning (EAS in Italian) in inclusive didactics

With the advent of new technologies, educational design has been enriched with innovative school methodologies, including the Episodes of Situated Learning (ESL).

Before talking specifically about ESL, the main theories of learning, to which ESL can be traced back, should be briefly mentioned.

An important contribution was made by Piaget, according to whom, as already mentioned, the learner actively acquires knowledge through interaction with objects, while the adult has the delicate task of evaluating the cognitive style of the learner and calibrate their teaching intervention on specific characteristics. He prepares the context in which the student learns independently.

For Vygotsky, on the other hand, learning is the process in which the child internalizes an adult action that acts as a model to make it his own, thus increasing his knowledge.

In school, even today, there is traces of Piaget's transmissive vision (frontal lesson), but Vygotsky's vision has increasingly established itself, concretizing in a social and collective process that allows students to act as part of a group within a context for situated learning.

The theory of so-called *situated learning* was proposed by Jean Lave and Etienne Wenger (1991) as a model of learning that takes place in a community of practice. According to Jean Lave and Etienne Wenger, situated learning consists in the assumption that learning develops as a result of three factors:

- active involvement;
- in specific contexts;
- in the relationship with people.

Only in this context can learning environments present the conditions in which people can learn best. Learning, according to Lave and Wenger, is based on the activities, context and culture in which it occurs, hence it is called situated.

The key principle of situated learning is the social interaction that is established within the community of practice, because learning requires social interaction and collaboration and is

facilitated and encouraged when scaffolding opportunities are available (Bruner). Furthermore, the tasks related to the learning process must be presented in authentic contexts.

It is a dynamic process linked to the active participation of the subject within a context, characterized by interaction with other members and with the surrounding situation.

The individual does not learn through lessons that transmit a defined amount of abstract knowledge, which will then be assimilated and applied in other contexts, but "learns by doing". This is a learning model that involves the person in real situations, in which she will have to assimilate notions in relation to the action she is carrying out.

In Italy, from an intuition of Pier Cesare Rivoltella (2013), ESL, Episodes of Situated Learning, were born, an interesting methodology that provides teachers with a very simple framework to be able to work, in the classroom, with tablets and computers of all kinds.

They represent an original working method on digital learning, building possible scenarios for working daily with new technologies. In this context, the IWB can also be used, in order to make the community of practice more meaningful and incisive. By episodes of situated learning we mean episodes, in fact, or minimum didactic units, which represent and constitute the fundamental piece around which to build one's own teaching.

Around an ESL teacher and students can develop a path that brings into play knowledge, skills and attitudes.

Each ESLS is made of three fundamental moments:

- an anticipatory moment: it is a real delivery (a video to watch, an experience to do, a document or a testimony to read) that is provided to the class (usually in flipped mode, i.e. to be carried out at home) with the aim of promoting recovery, reinforcing the prerequisites, focusing attention on the didactic object and familiarizing with the vocabulary that will be used (stimulus situation);

- an operational moment: the class carries out a micro-activity, whose duration must be between 25 and 30 minutes, individual or group, which must lead to some product (it can be a comic page, a concept map, a short video, a collage of information). In this phase the teacher must be good at finding the suitable technological tools to achieve the goal he has set himself;

- a moment of restructuring: it is the debriefing, that is the reflection on the activated processes, which serves to fix the elements, providing a conceptual framework for the student's experiential work. It can take place through free brainstorming or with more structured analysis techniques (check-list, guiding questions, concept maps, etc.). The teacher concludes the ESL with a short lecture in which he summarizes the key concepts, provides indications for further study.

The method is able to exploit the three basic moments of learning, as identified by the pedagogical sciences: experience, modeling, repetition.

First of all, it is built on the experience that has represented the fulcrum of the theories of the activist tradition and post-Piagetian psychology. The experience is present both in the first phase, the anticipatory moment, in which the student is given the task of dealing with the acquisition of data and information, reflecting on how understandable it is or not; but also in the second phase, the operative moment, in which he is asked to solve a problem through a productive activity

Furthermore, it also exploits modeling (imitation), a valid learning tool that bases its roots on *Rizzolatti's mirror neurons*. This theory identified a particular type of motor sense neurons that are activated not only when a determined action is performed, but also when it is performed by someone else or simulated on a mental level only. Observation already constitutes an exercise.

In the case of ESL, modeling is found in all three structural moments: in the anticipatory moment, when the teacher proposes stimulus situations or offers examples to students; in the operative moment, when collaborative and cooperative activities are foreseen between the students, who therefore have the opportunity to confront and observe each other; in the last phase, the restructuring phase, thanks to the synthesis contribution of the teacher and the considera-

tions of the pupils.

Finally, there is also the repetition which has the function of reinforcing and maintaining the synaptic relationships already activated. Our brain, in fact, tends to create space for new synapses from time to time, so repetition has an important function of consolidating the results achieved and, as demonstrated by the studies by Eric Kandel, guides the passage of information from the short-term to long-term memory (Squire, Kandel, 2010). In the case of ESL, the student returns to the same concepts both in domestic work and in the moment of activities and debrifing, the final moment in which one has the opportunity to return to the same problem several times, favoring its persistence.

The ESL is built on three fundamental principles:

1. creation by inhibition;
2. speed;
3. selection.

The first point, creation by inhibition, concerns precisely the recognition carried out by the student in the anticipatory phase: this activity tends to occur without previously acquired learning and therefore at this moment inhibition plays a key role, that is our ability to exclude some solutions, deciding what not to do rather than looking for what we really need.

The second point, speed, concerns the time that the teacher tends to spend to introduce the activity and to discuss it, and what the student takes to carry out his / her task. Usually, it is a fairly compact (micro-design) module that fits into larger programming.

The third aspect, that of selection, is inspired by the logic of the *Flipped Lesson*, according to which the student must strive to find those solutions that are part of his way of thinking and that make sense for him; with a view to parsimony, the same that must characterize the action of the teacher, who must focus on what really matters from the didactic point of view, avoiding what is irrelevant for the success of the educational intervention.

4. Planning learning paths through the use of assistive technologies:

In this paragraph we analyses the main features of assistive technologies in relation to the different forms of disability. The assistive technology must be a support especially for autistic individuals, concerning the communicative dimension. An important consideration should be given to the individual features and to the students needs, identifying the best strategies and tools. There are numerous software that are mainly related by visual materials to promote the visual-spatial communication channel.

Through the Augmentative Alternative Communication (CAA) it is possible to increase social skills, by promoting inclusion. Augmentative because includes strategies that enhance the subject skills; Alternative because has different resources compared to verbal language. According to Cafiero: “The CAA is a form of assistive technology. It can incorporate drawings, photographs, symbols, words, letters, objects used alone or in combination with communication tables, devices with voice transmission or keyboards” (Cafiero, 2009, p.20).

The CAA is a system that employs writing, symbols, images, instruments, devices or actions to compensate communication difficulties. The visual modes of communication should be a priority for the individuals with disabilities, since visual skills are their strenght. Many oh these systems are based on iconic communication to which different messages are associated, achieved through specific software. So we point out *Lula* of Opifer: a rehabilitative software, structured in six levels. The structure of this software provides a pre-level with the intention of catching the subject attention and to motivate him to observe what is showed on the monitor. The other levels that follow the pre-level one, work on the first forms of communication, the main grammatical structures and basic informations, connected to the sharing of an event and on the understanding of desires and emotions. Regarding students with visual sensory disabilities issues, the problem in using technological tools (for example the computer), is to send the information to the machine (input) and perform what returns (output). The essential is to favour

the use of keyboard with a software that facilitate the memorization of the key position since nursery school. The Braille display is available among the output devices designed for this kind of disability: it summarizes the characters received by the screen reader and interprets the text shown on the monitor, translating it into vocal syntesis or in Braille text which is sent to a tactile device (Diodati, 2007). The Braille printers are able to print any text in relief. The scanner together with the OCR programme (Optical Character Recognition), it allows to acquire images and printed texts turning them into multi-modal digital documents. Audiobooks are very useful. For example *Biblos*, is a word processing system for the production of audiobooks, Braille printer and tactile graphics - drawings in relief in which the lines are realized with a series of contiguous relief points – has become one of the most complete tool for its distinctive accessibility and complex functions. *Biblos* includes a complex text editor, a spell check function and the possibility to access online resources (dictionary, encyclopedia and translators). For visually impaired students are available specific aids such as "enlargement software" and keyboards with larger printed letters. Its fundamental to use clear and well-marked characters and it is not recommended to use high resolution screens (Cramerotti, Turini, 2015, pp.7-10). Regarding the hearing disability, it can cause learning difficulties, delays in the acquisition, in the knowledge and compromise of development of thought. There aren`t specific devices for this kind of disability, which doesn`t present problems regarding the access to the computer, but in the fruition of its contents.

The use of assistive technologies is finalized to the language learning, particularly in the lexis: there are software that recognize what is dictated by the user, through a microphone and are able to write down what is pronunced. Other programmes are available, utilized by teachers and students, for the creation of subtitled hypertext units and allow to check the italian dictionary of sign language, online. It is recommended to use the Interactive Multimedia Whiteboard (LIM), which provides greater accessibility, taking advantage of the visual channel and interactive mode. The physical disabilities are mainly subject to environmental restrictions caused by the "architectural barriers". It covers several aspects, including the inability of making certain movements, difficulties in the oculo-manual coordinations, lack of precision and speed in the movement and limited muscolar strenght. The computer is fundamental: for example, looking at dyspraxia students, it is easier to write with the computer rather than manually. For what concerns physical disability, aids must at first solve the problem of computer access, therefore, the use of input devices. The main aids to be used are: special keyboards, targeting systems, voice recognition and word prediction software, which suggest a series of words, after typing the first characters, facilitating text writing. Another strong component is represented by targeting systems: the most common is the mouse; with the pointer arrow you can indicate objects of interest on the screen, selecting them with a "click", moving and activating them. This type of system is not appropriate for many students with physical disabilities, because placing the pointer on the chosen object requires firmness (Fogarolo, 2012, p.32).

Many alternatives to the traditional mouse exist that can also be performed with the keyboard: the trackball mouse (in which a sphere moves, placed over the mouse, that reproduce the movements of the cursor); the touch pad (a flat surface that responds to the tact); the joystick (controls the movements of the cursor with a lever); the touch screen (sensitive and transparent surface). Another alternative to the mouse is the voice-recognition: the computer recognizes and stores the human voice, replacing the mouse functions. Intellectual disability students and students with learning difficulties, the devices are managed by the teacher. Its important to choose the right software taking into consideration several aspects: by choosing appropriate feedbacks and reinforcements, avoiding monotonous and repetitive activities, proposing graduated targets and finally help the student to gain autonomy. The teacher has to personalize the software, regulating the characteristics of the proposed exercises, the time of its development and the most suitable feedback based on the students characteristics (Besio, 2005).

A lot of word-processing programs are available: the Symwriter-Auxilia, which associates symbols to the script, working on textual symbolization. It takes into account the plurals of

names, of the person, tenses, articles and prepositions. The system also has a voice syntesis (letter, word, phrase) and a spell check, backed up by symbols.

5.Final considerations:

This work highlights how the use of technology in schools has fostered a better learning condition, by increasing interest, motivation and self-efficacy. And at the same time, it stresses the importance, to make a learning environment more inclusive, to introduce a teaching based on shared values of citizenship, equal rights and equal opportunities. It is necessary to structure a educational programme, meeting the needs of all. The aim is to strenghten the school system at the operational level and in terms of skill development. An equal access to technologies for all users is considered a priority.

In the information society, equal access to technologies by all users, including, therefore, those with disability problems, is considered a priority and a key factor for the activation of inclusive processes at school and beyond.

The necessity of designing and providing paths emerge, characterized by accessibility, even from a methodological and didactic point of view. The possession of digital skills supports the social inclusion and enables to communicate and participate in virtual collaborative networks. IT technologies are useful for students with disabilities. The computer can help to improve personal autonomy, if properly set up, it can facilitate the development of structured activities (reading-writing) making the written expression more fluid allowing a faster speed of execution of tasks than the use of pen and paper, thus helping to reduce the gap of the visually disabled pupil and the rest of the class. IT barriers are influenced by the users personal skills, that is necessary to enhance the students compensatory abilities, giving importance to the motivational aspects and promoting the awareness of their own limits and needs.

The support offered by information and communication technologies, intended as tools to facilitate learning and as “prostheses” of the senses, is certainly an element of support for the visually disabled, to the extent that it increases with the progressive improvement and technological enrichment. On the other hand, it is the hostility of the cultural and physical environment that causes or aggravates the disability. The role of assistive technologies is substantially linked to the context in which they are used and to the subject who is using them in that context. Obviously, the more proactive and tolerant the environment, the greater the degree of autonomy perceived by the student with disability.

The use of new technologies undoubtedly represents an added value, for the visually impaired and more generally for the whole class, in order to facilitate the development of cognitive, emotional and social skills. So that the school does not itself become a factor of exclusion by generating environments that create disability, according to the ICF model, an approach to inclusion is required where individuals, tools and methodologies are functional and mutually supportive.

Technology can help achieve these goals. It provides support tools (aids, software) that allow you to overcome barriers and limitations that a particular condition of disability can place on access to learning content, guaranteeing all students the opportunity to participate in the activities. But not only: it offers the possibility of using versatile, adaptable, malleable tools, which allow you to modify the didactic content to meet the specific needs of the student. Furthermore, technology can facilitate cooperative and collaborative work in the classroom, allowing each student to make their own contribution in the creation of original materials, based on their skills and resources.

It is clear, however, that the IT tool, although it may have apparently positive characteristics, alone is not enough, neither to generate innovation, nor to generate learning and inclusion.

To respond to the need to implement quality inclusive teaching in the school, which allows each student to feel normal and special at the same time (different from the others due to its peculiarities and particular needs), it is necessary to overcome traditional teaching to arrive at inclusive teaching. This requires the teacher to gradually learn to change the belief that the

main source of learning for his pupils is himself; foster a positive atmosphere through effective interactive communication between him and the class and between students; enhance pupils by respecting their uniqueness (learning styles and personalities), teaching them responsibility, reflection and self-awareness; manage the class by activating positive interdependence in a climate of coherence, sharing and mutual help.

Bibliography

Anichini A. (2003). *Testo, scrittura, editoria multimediale*, Apogeo, Milano.

Besio S. (2005). *Tecnologie assistive per la disabilità,* Pensa Multimedia, Lecce.

Biondi G. (2013). *La scuola dopo le nuove tecnologie*, Apogeo, Milano.

Boldizoni D., Nacamulli C. Raoul, (2013). *Oltre l'aula*, Apogeo, Milano.

Cafiero J.M. (2009) *Comunicazione Aumentativa e Alternativa*, Erickson, Trento.

Calvani A. (2001). *I nuovi media nella scuola. Perché, come, quando avvalersene*, Carocci Editore, Roma.

Canevaro A. (2008), *Pietre che affiorano. I mediatori efficaci in educazione con la «logica del domino*»**, Erickson,** Trento.

Cantoni L., Di Blas N., Bolchini D. (2003). *Comunicazione, qualità, usabilità,* Apogeo, Milano.

Cottini L. (2017). *Didattica speciale e inclusione scolastica*, Carocci Editore, Roma.

Devoti A.G. (2000). *Oltre la parola. Saggio di didattica multimediale*, Armando Editore, Roma.

Diodati M. (2007). *Accessibilità. Guida completa*, Apogeo, Milano.

Filemi F. (1997). *Analogico e digitale, la cultura e la comunicazione*, Edizioni Goliardiche, Trieste.

Fogarolo F. (2012). *Il computer di sostegno. Ausili informatici a scuola*, Erickson, Trento.

Gardner H. (1983). *Frames of mind: the theory of multiple intelligences*. London, Granada Publishing

Ianes D. (2013). *La speciale normalità*. *Strategie di integrazione e inclusione per le disabilità e i Bisogni Educativi Speciali*, Erickson, Trento.

Ianes D., Canevaro A. (2015). *Buone prassi di integrazione e inclusione scolastica*, Erickson, Trento.

Lave J., Wenger E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge Cambridge university press.

Lazzari M. (2017). *Istituzioni di tecnologia didattica*, Studium Edizioni, Roma.

Mantovani G., (1995). *Comunicazione e identità*, Il Mulino, Bologna.

Maragliano R. (2004). *Nuovo manuale di didattica multimediale*, Laterza, Roma.

Midoro V. (2016). *La scuola ai tempi del digitale. Istruzioni per costruire una scuola nuova*, Franco Angeli Editore, Milano.

Norman D. A. (2000). *Il computer invisibile*, Apogeo, Milano.

Parmigiani D. (2004). *Tecnologie per la didattica. Dai fondamenti dell'antropologia multimediale all'azione educativa*, Franco Angeli, Milano.

Piaget J. (1956). Avviamento al calcolo, La Nuova Italia, Firenze.

Pinnelli S. (2007). *Tecnologie nei contesti educativi*, Carocci, Roma.

Riva G. (2008). *La Psicologia dei Nuovi Media*, Il Mulino, Bologna.

Rivoltella P. (2013). *Fare didattica con gli EAS : episodi di apprendimento situati*. Brescia, La Scuola.

Roiazzi C., Burchiellaro E. (2005). *Il computer va in classe*, La scuola, Brescia.

Cramerotti S., Turrini M. (2015). *Disabilità sensoriale a scuola : strategie efficaci per gli insegnanti.* Trento, Erickson.

Skinner B. F. (1954). The science of learning and the art of teaching. *Harvard Educational Review*, 24, 86–97.

Squire L., Kandel E. (2010). *Come funziona la memoria: meccanismi molecolari e cognitivi*. Bologna, Zanichelli.

Teatino A. (2010). *Innovazione digitale e glottodidattica*. *Riflessioni e proposte*, DigiLabs, Bari.
Vygotskij L. (1974). *Storia dello sviluppo delle funzioni psichiche superiori e altri scritti*. Firenze, Giunti Lisciani.
Wood D., Bruner J., Ross G. (1976). The Role of Tutoring in Problem Solving. *Journal of Child Psychology and Psychiatry*, 17, pp 89-100.