EDITORIAL

In the 1950's, Morton Heilig imagined a machine which he called the Experience Theater. It combined all five senses in a realistic way, immersing the spectator in the action that was going on the screen. He built a prototype from his vision and called it Sensorama. It was patented in 1962 together with five films which this machine projected and which combined sight, hearing, smell and touch. The high production costs did not permit their commercial distribution.

But the question is: how far are we from this virtual reality? It seems we are already there with different kinds of applications, with different levels and complexities and it is not possible to think that we can stop. We cannot avoid the natural development of events.

Now we are on the web. What then? Studying online: to trust or not to trust? This is the question! On 6th August 1991 Tim Bernes Lee (now Sir Timothy John Berners-Lee) invented the World Wide Web (W3, by now simplified to Web or World Net) which defines "*a wide area of hypermedia information retrieval initiative aiming to give universal access to a large universe of documents*"and which we can consider, at least for the ICT, the beginning of the World.

The ACM (Association for Computing Machinery) defines the Human-Computer Interaction (HCI) "*a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them."With the addition of: "An important facet of HCI is the securing of user satisfaction.*"

It's culture (cannot surely be estimated for how many but certainly for hundreds of millions of people), terms (mixed up) like: computer, video, joystick, remote control, cell phone, iPod, Bluetooth, helmets, gloves, overalls, robot; and, in crescendo: ubiquitous computing (ubicomp), pervasive computing, Internet of Things, haptic computing (haptics), Things that Think (TTT) of the *MIT Media Lab* defined in the following way on the net: "*Things That Think is inventing the future of digitally augmented object and environments. We bring a unique, boundary-breaking perspective to research, uniting leaders in science, engineering, design, and art. Grounded by extensive corporate sponsor interaction, our prototypes and demonstrations aim to inspire the products and services of tomorrow*". In other words, the Future!

It has been said that the actual Internet IPv4 protocol will be overcome by the IPv6, system capable of instantaneously identifying any kind of subject. We are heading

towards the Internet of Things, which is already active with Semantic Web and will be more and more a matter of studies.

These past considerations make me remember a poem of Metastasio: "*Wherever the look I turn around great God I see you, in Your works I admire you, I recognize you in me. The earth, the sea, the sky talk about Your Power, You are present in everything but more then other in me*"[1].

Are there enough elements for an accusation of sacrilege or blasphemy if we tried to put the Web in the place of God? But the temptation is strong and for some it's even natural to do so!

The e-learning experts claim that the didactic material should be built ad hoc to guarantee the four principal characteristics of the on-line formation: modularity, interactivity, exhaustively, interoperability. Material made of modules, called Learning Object (LO), short to better personalize timing and approach modality of the contents, the user must interact with the didactic material which should answer the motivational needs of the man-machine interaction, each module aims to a formation goal and leads the user to the completion of such goal, didactic material to be distributed on any technological platform and guarantee the traceability of the formation action. For this purpose some standards were singled out and implemented to guarantee the communication between the different systems and make so that a module, conceived on one platform could be integrated into another one. Widespread standards are SCORM (Sharable Courseware Objects Reference Mode), ARIADNE (Alliance of Remote Instructional Authoring and Distribution Network for Europe), PROMETEUS (PROmoting Multimedia access to Education and Training in EUropean Society).

In this context, the Markup Languages play an interesting role "*born to signal through appropriate instructions, the logical characteristics of a document and of its parts: for example, the title function played by a particular portion of the text. The instructions of a markup language are interpreted by the browser, which decides how to visualize the relative information*[2]"). These consent a better atomization of the contents and a more efficient exportability on the many supports, PDAs included. The most known are: HTML (HyperText Markup Language), XML (Extensible Markup Language) and others.

The American magazine of Economy and Finance "*Forbes*" in 2008 named Mark Elliot Zuckerberg "*the youngest millionaire of the world*". Mark Zuckerberg (born in 1984) is the founder of Facebook, one of the most widespread social networks of our Planet, and is defined as "*a social platform that permits you to connect yourself with your friends and with whoever works, studies and lives close to you*". But Giulia Pulcina says in the article Facebook: "THE" social network "...*Facebook securely*

[1] English translation of the Metastasio poem: "Ovunque il guardo io giro immenso Dio ti vedo, nell'opre Tue ti ammiro, ti riconosco in me. La terra, il mare, il cielo parlan del Tuo Potere, Tu sei presente in tutto ma piu' Io sei in me"

[2] Definition by Gianluca Arcolini

is a step forward in the sphere of means of communication..." and after positive and negative considerations about the instrument, she affirms: "*My conclusion is that the social network is a very powerful instrument and as any weapon, one has to know how to use it with intelligence*".

Regarding Didactic Communication and more in general Educational, Formation and Instruction processes, the intelligent use of these processes must be considered because they aim to modifying the mind (pedagogical perfidy or violence?): that of the learner.

A specific characteristic of the Didactic Communication is the Interactivity, that is, the possibility of controlling and/or learning by doing. We can say that the Information and Communication Technology (TIC)[3] are naturally putting the Learner in the position of *participant* and not of *spectator* of an *individualization* process tending to humanize the Instruction in opposition to the *traditional lessons* common to everybody.

It could be like *going back to the origins*, at the time when the Learner had its own pedagogue or preceptor or, modernly called, Tutor. Maybe but there are many characterizations that are yet to be found.

And here the e-Learning, considered the overcoming and the logical development of FAD (Distance Learning) has an important and fundamental role not only for the possibilities it already offers but above all for the research activities that are developing. These aim defining theoretical lines with rigorous borders to realize systems that overcome the aspects of "content distributor", permitting the users (Students, Learners, Teachers,...) to accomplish learning processes in (almost) complete autonomy. This is because, other then the already mentioned interactivity, e-learning adds to the Instruction process: dynamicity, that is, acquisition of new specific abilities and modularity, in other words, organization of the contents in function of the training goals and of the learning abilities of the User.

The attention moves onto: the net, to Internet, to the Web for the technological aspects and for its contents in "Subject" of the Didactic Communication, that is: there shape, there structure and general characteristics, including the cognitive, pedagogical and semantical aspects.

A long time has passed from when in the 1960's one started thinking of Informatics in Didactics and in Formation. But not only. The terminology used was of the kind "*Contribution of Informatics in the Learning Processes*" characterizing it with the properties of: *Method* (Systematicity, Analyses, Algorithmitization, Programming,) *Language* [Communication Man-Man, Man-Machine, Machine-Man, Machine-Machine (Representation)], *Instruments* [Elaboration (Process), Data Transformation in Information (Construction of Knowledge)]. Regarding the activities related to Informatics and Didactics, in the 1970's a Work Group coordinated by myself founded AICA (Italian Association for Informatics and Automatic Calculation); which in 2011 will complete

[3] Information and Communication Technologies (ICT)

50 years of foundation, AED - Applications of the Didactic Elaborators, which had a national committee as parent CCAED (Coordinating Committee for the Applications of Didactic Elaborators) operating at end of the 1970's, beginning of the 1980's. The CCAED in 1982 and in 1983 organized a Summer School at the University of Lecce on Didactics of Informatics (None of the Editors consulted accepted to publish the Acts!). Around a hundred Teachers of the Italian School and Didactic Researchers participated, including those of Didactic Discipline, some deserting and/or abandoning the updating course of the MPI (Ministry of Public Instruction) on the National Informatics Plan, known as PNI-1 (1982).

In1984, on suggestion of the President of AICA Giorgio Sacerdoti, and with the contribution of the AED Group, a census survey is activated inside AICA, on "*Didactic Software*" in use both in Schools and in Companies. The editorial activity, edited by Giuliana Brandazzi furnished printed volumes of the reasoned analysis of the returned questionnaires and the results were communicated in a workshop called DIDAMATICA: InforMATICA for the DIDActics, organized in Milan, integrated with specific conferences held by experts on themes regarding possibilities, experiences and prospectives of the use of Informatics in Didactics.

In the 1985 edition, some of the participants, especially Teachers, started complaining saying: "*Why do we have to come to Milan to hear about these subjects?*".

When writing the report of that edition, together with Sacerdoti, we decided to organize a Congress with a regular Call for papers and closely examine the Works that treated Experiences and Research activities with a regular review and make it an itinerant event provided that a University would organize it.

The University of Bari proposed itself and held the first edition. It was an unexpected success. The overcoming of the Census survey phase had started and even though it was of great value, it didn't have any indication on: *specific DIDACTIC SOFTWARE used in Courses and in Teaching; the added value to the training process; when and how Didactics had changed or was modified; what kind of experimentation had been done*.

Indications regarding the last points were asked for and this fact decreased drastically the answers to the questionnaires, or better, the number of returned questionnaires. However, the census survey continued until the edition of DIDAMATICA '92, held at Campobasso. DIDAMATICA editions were held at: Bari, Bologna - Headquarter of Cesena, Catania, Genoa, Siena, Naples (together with Galassia Gutemberg), Ferrara (inside EXPO-e-Learning), inside TED (Educational Technologies organized by MIUR in Genoa), Potenza, Udine, Cagliari, Taranto, Trento, Rome (in some headquarters more then one edition).

For many years DIDAMATICA was considered the main activity of the AED-Applications of Elaborators to Didactics Work Group which in the years changed name, undertaking Informatics and Didactics. The success of the event induced AICA at the end of the 1990's to consider it an activity of the Association in the same way

as the National Convention, announcing it as: "*the Convention promoted annually by AICA which proposes to furnish a wide and delved frame of the research, of the new developments and of the ongoing experiences of Applied Informatics to Didactics in the different contests of learning*".

Considering the themes, the propositions and the results that emerged in the many editions, it can be said that DIDAMATICA provided and provides a complex and qualified frame of the research and ongoing experiences at national level and not only. What happens is that with the progress of the technologies and methodologies, necessities and expectations of the School world and in general from Formation changes. We ask ourselves what could be more adequate. Ideas take shape on instruments of practical, scientific and methodological kind that best answer to the requests of the users.

Keeping in mind these preoccupations, the editions in the last years, starting from DIDAMATICA 2002 in Naples, observed an increasing attention towards Distance Learning stressing on the processes and the products of e-Learning both as method and as instrument, enhancing the use of the computer network as an essential instrument for instruction.

The next step, thus comprehends both platforms and self-learning systems maybe with an excessive emphasis on the latter.

The edition hosted inside TED surely signed an opening in this direction.

The e-Learning phenomenon, in spite of the vastness of techniques, methodologies, approach characteristics and aims, gave birth to new initiatives: SIe-L (Italian Society for E-Learning), SIREM (Italian Society of Research on Media Education), Work Group "Artificial Intelligence & E-Learning" of the AI*IA (Italian Association for Artificial Intelligence), magazines and meetings dedicated to the use of the computer network as an instrument of innovation and communication as well as a commonplace of management of training processes.

In fact, the edition held in Ferrara was conceived as propaedeutics to the EXPO e-Learning fair 2004, the first totally dedicated to the universe of net formation, with particular attention to the sectors of school, university and permanent formation.

The excessive interest towards innovation as well as the increasing diffusion of modern technologies, applied to the formation world brings within itself the risk of privileging and emphasizing the technological aspects in place of the methodological, pedagogical and didactical quality aspects.

For this reason, in DIDAMATICA, the attention has always been focalized on the relationship between TIC (Information and Communication Technologies) and TD (Didactic Technology) emphasizing the centrality of the educational and formation processes in relation to the innovative instruments used to facilitate the access and to improve the efficiency and effectiveness.

This because DIDAMATICA has always had a pivotal role in the diffusion of the informatics culture in the school world, frequently anticipating ongoing actions of

MIUR from *PNI (National Informatics Plan) which revealed itself almost a failure and maybe a marketing operation; for PSTD (Developing Program of Didactis Technologies) to elevate the quality of the "formation processes through the use of multimedia techniques and technologies and diffusion of the TIC"; for the FORTIC (National Plan of FORmation of Teachers on the Information and Communication Technologies), ...* permitting the Teachers to assume an exploring and constructive attitude in relation to Technology applied to Didactics.

From the Taranto edition (2008) on, there has been a direct involvement of MIUR (Ministry of Instruction of the University and Research), of interested Ministries and other Institutions like ISFOL (Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori), Defense Staff , CNIPA (Centro Nazionale per Informatica nella Pubblica Amministrazione), CRUI (Conferenza dei Rettori delle Università Italiane) and CINI (Consorzio Interuniversitario Nazionale per l'Informatica) in DIDAMATICA.

The works reported in this number of Je-LKS regard e-Learning and in most part of the cases are of re-elaborated propositions of works accepted at DIDAMATICA 2010. Following, synthesis and motivations are given in the many works that the Authors have considered in relation to the use of e-learning instruments and of fundamental themes to the applications of the learning processes with technological methods and instruments.

In the work "*A recommendation method for e-learning environments: the rule-based technique*" by Pieropaolo Di Bitonto, Maria Laterza, Teresa Roselli and Veronica Rossano of the Research Group of the Department of Informatics of the University "Aldo Moro" of Bari considering that the e-learning development brought an explosion of learning resources available on the net that can favor a critical spirit in the student but can also confuse the student in the search for an adequate resource for his own needs and own style of learning, they have activated a research (partially financed with funds from Ateneo ex 60%) on recommendation systems, known in other contests, applied to e-learning environments. Innovative strategy that elaborates suggestions, combining the information on the domain and the cognitive characteristics of the student.

In the work "*The ontological identity of learning objects: an analysis proposal*" by the research group Alessandro Gattino, Gianni Vercelli and Giuliano Vivanet of the I.T.S. Gastaldi-Abba of Genoa and of DIST – Department of Systematic Informatics and Telematics of the University of Genoa a preliminary study on the ontological identity of the LO is proposed with the purpose of formulating a well founded definition for object of learning. This having noticed that in the projects developed with semantical technologies applied to educational contexts, the ontologies of the LO are projected based on the pragmatic convenience of the applicative contexts and of the intuition of the developers.

In the work "*Competency frameworks for the use of ICT at School: from the ISO IEC 19796-1 Standard to the Unesco ICT-CST Italian localization*" Serena Battigelli, Lisa Marmorato, Ilaria Messina and Angela Maria Sugliano of DIST – Department of Informatics, Systematics and Telematics of the University of Genoa put themselves the question: Which concrete skills should the teacher employ in the third millennium to realize a didactics aimed to forming citizens of the 21st century? In the contribution are illustrated the principal repertories of skills (EIfEL, EUCIP, IITT) developed by the international organisms to describe the abilities in terms of use of technology which the teachers of today and tomorrow should have. Practically, the work proposes a first research result that evidenced the elements of the repertories considered, coherent with the different processes of the analyzed standards and "usable" in every culture, being centered on a behavioral pedagogical approach and on a constructive type. The authors conclude with a point of view of the European Pedagogical License on the TIC (EPICT) of the teacher of the third millennium.

In the work "*Semantic Management Systems for the Material Support of E-learning Platforms*" from group Vincenzo Di Lecce, Marco Calabrese, Domenico Soldo e Antonella Giove from DIASS – Polytechnic of Bari, myHermes s.r.l., II Faculty of Engineering – Polytechnic of Bari, they describe a system for the automatic structuring and the assisted fruition of the supporting material of the learning modules in the e-learning platforms with semantical-lexical structure that indexes the linguistic contents to the different levels (for example book, chapter, paragraph, indentation, sentence), using the semantical-lexical Dictionary WordNet, a prototype which is in testing phase at the Laboratory AeFLab of the Polytechnic of Bari. The system consists of two distinct processes that share the same base knowledge: semantical indexing of the knowledge for the acquisition of the digital document indicated by the teacher and a guided exploring process that permits the learner to question the knowledge base.

In the work "*Collaborative Learning Strategies in a Blended International Context*" Giovanni Torrisi and Yuri Kazepov of the Institute of Sociology of the University of Urbino, presented the experience of blended learning realized at the European Master in Compared Urban Studies E-Urbs, of 60 ECTS, financed by the European funds "Virtual Campus". The authors tackled the universal problem of the construction of the Society of Knowledge. The social-political references for this are: the resolution of the European Council of Lisbon 2000 and the objectives of the process of Bologna on the Europeanization of the secondary education systems (The process of Bologna falls in the objectives of Instructions and Formation 2020 and Europe 2020).

E-Urbs, organized by nine universities of 8 European countries, headed by the University of Urbino, is seen as a laboratory where the difficulties that the on-line course experiment were treated: a decrease in motivation and attention, problems in the

constitution of a multicultural society (24 students of 14 countries and 5 continents), falling out, exasperating communicative friction, etc., and in E-Urbs, depending on: cultural differences; language and age differences; contemporary presence of different institutes of transnational level; different disciplinary traditions; physical and virtual distance; communication technologies. The results are considered by the Authors gratifying and coherent with the initial hypothesis. The students really appreciated "*The possibility to be part of a "classroom", the solidarity and the support that inevitably takes place thanks to the different cultures and original preparation, the driving force that helps significantly in the preparation and approach to the exams, and experience and friendship that will last a lifetime*".

In the work "*To an integrated didactic model*" Marcello Balzani, Carlo Bughi, Giuseppe Dosi and Gabrielle Tonelli of the Department of Architecture of the University of Ferrara face the problem of innovation in Didactics, referring to concepts and considerations made by Pavel Boytchev on the use of technology in the learning processes "*not to be considered definite and in no way an alibi for teachers to disengage from their role*" but to consider it a great opportunity that needs constant attention to the goal of effectiveness in didactics; an experience of integrated Didactics conducted by the Faculty of Architecture of Ferrara is described. The work is centered on the integration experimentation between e-learning and traditional didactics to realize a gradual innovation, explicated by due experiments described as: innovating in evaluation and innovating in formation which were inserted in two specific teaching classes: Mapping 2 and Representation Techniques "that aim at the "conceptualization of the tridimensional space" in the formation of an Architect.

In the work "*Teaching literature in the blended form. The student's profile*" Elvira del Vecchio of the University "G. D'Annunzio" of Chieti-Pescara and the Telematic University "L. da Vinci" of Torrevecchia Teatina-Chieti present a blended e-learning experience conducted at the Faculty of Language and Foreign Literature of the University of Pescara with the intent to innovate the didactics of literature, making it more "seminar": in this case a module of German Literature of only 3 University Formation Credits (CFU) was described. The strong point of the whole formula in the Author's opinion : the training of writing for a systematic rethinking of the contents presented in class; the asynchronicity of such regular exercise that forces to concentrate on the contribution of the other equals and not on the issuer and guarantees everybody (even to the most introversive) moments of reflection and confrontation. The results obtained indicate a practical path with the possibility of requalifying the university teaching of literature and of human science educating, in general, to the habit of writing and to guided reflection.

Among the works the article "*An operational model for monitoring to guarantee quality and efficacy to e-learning training courses in the Public Administration – The*

MarchE-Learning project experience" by Tommaso Leo, Elizabeth Da Lio and Martina Pennacchietti of the Department of Informatics, Management and Automation Engineering of the Polytechnic University of Marche – Ancona is not one of those proposed by the magazine to the Authors among those presented at DIDAMATICA 2010. It is about a formation model in e-learning of the employees of the Local Public Authority and of an initiative of the Regional Formation School (SFR), promoter, and the universities of the Region and il Sole 24 Ore (financial newspaper), partners. The experience was realized with the classical criteria of the processes of Professional Formation with preliminary analyses, monitoring with analyses in progress, conclusion with follow up analyses and with relative feed-back necessary for work in progress adjustments of the quality control of the formation path.

For some time, I have been fond of and tormented by a "slogan" "*To inform is easy, to Educate is difficult*". I propose, repeat and comment it in all occasions. We give for granted that the meaning of Inform. Educate is tied to the vision that the Formation should be considered a constructive process of formal and mental structure for levels that we can call pro-logical and logical, in a sequential-recurrent modality in the construction of the new known (construction of the Knowledge): an achieved logical level is a pre-logical level for the construction of the next logic. Drawing for a child can be considered pre-logical to writing the signs of the alphabet (logic level) which becomes pre-logical to the constructions of syllables and words and so on till the so called permanent Formation or for the rest of one's Life. Not only. The Goal of Formation is to contrast the obsolescence of knowledge, maintain professionalism in time, create specific added value and construct new professional qualities. The Knowledge, which may assume different meanings according to the context, has direct and indirect connections (as written in Wikipedia) with the concepts of *meaning, information, instruction, communication, representation, learning and mental stimulus*". But in trying to give, let's say, not such a rough classification of Knowledge, three levels can be considered: *Cultural* Knowledge common to everyone, *Professional* Knowledge which is a prerogative of Crafts and of Specialists and the *Scientific* Knowledge which belongs to the research world. These three levels can be thought interconnected in the ordinated direction *Scientific, Professional, Cultural* meaning that a Knowledge is for everyone when it is passed *from the Scientific to the Professional to the Cultural* (the unbundling or theft of Knowledge). An Example can be made and considerations in merit: the Writing could not be *Cultural* Knowledge for some people today, as the use of the Telephone or of the Computer or not to mention Internet. This means that a skill or a behavior or an activity is cultural when its use doesn't create any problems. Do and know how to do!

But then I continue with the following consideration: The good teachers have always existed and will always be: they can't be substituted.

However, when they aren't present, they take with them Methodological and In-

strumental paradigms and years of Experience. These were: experts of one or more Subjects in their Formation and in the relative models of Didactic Communication. The activities of e-learning with all its components [Didactic Software (SD), WEB, Learning Object (LO), Internet, learning Community, …] aim at recuperating and enclosing the expertise to be used by others and become reference models and paradigms for standards where necessary, appropriate and convenient.

I would like to conclude with a historical cultural and almost philosophical *excursus* (Andronico *et al.*, 1988).

Didactics even though having *teaching* methods as a subject of studies has always been considered an art: the art of teaching to which is associated a distinct function of the *Teacher that transmits the Knowledge*. Question: *teaching is Technique, Science, Technology, Communication Processes* or what else? The answer that each one will give himself can take to a *dogmatic* or even *spontaneous* attitude, restrictive for the construction of Knowledge and negative for the *Learner* because it excludes the *personalization* of the teaching. Certainly the oldest teaching method was the oral one; better still, before the advent of Writing it was certainly the only integrated one if one thinks on the many types of miming and/or iconic language: the first Didactic Technology *naturally audiovisual and we would say today,* ICT *equivalent*. The ICT were composed of: voice, sound, mimes and figures, frequently on the sand with the disadvantage of the non *persistency* of the sign.

Today the concept that we have of ICT in Didactics is complex and articulated (starting with: voice chalk and blackboard, voice and overhead projector, films, slides television systems, computer, continuing in a disorderly way with: Internet, e-Learning, Web, Web 2.0, Learning Object, Base Knowledge, Repository of didactic materials, Ontologies, Semantic Web, Markup Language, digital Libraries, LIM, eBook, etc) with different connotations and functionality to the technologies in use and, natural integration of the technologies mentioned where the single component, each one independently, brings all those fundamental aspects contemporary to their use in a coherent way in the whole Didactic process. Besides no Didactic process can develop without integration of many components (technologies). The most basic example can be the one derived from the primitive and universal relation between "*langue*" and "*word*" (parole). "word" as derived from the learning process and so of the construction of the formal and "*langue*" as a mental process below the construction of new formal (de Saussure, 1916; Manca, 1974; Trisciuzzi, 1985).

The means of *communication* used in the Didactic process are the ones that permit to achieve coherently and correctly the goal of *teaching* which is that of constructing the *formal*.

Therefore, to the concept of *formal* can be added the concept of *Knowing* or of *Knowledge* which cannot be the result of a transmission process but rather of a process of *elaboration of data* and *information* that involves *methods, languages and instru-*

ments (Software and Hardware) associating, to the latter, the s*ystematic construction of operative, didactical and pedagogical criterion* dependent and independent on the reference Domains of Knowledge.

A Didactic process results being an *equilibrated dose of methods, messages and means* that guarantee *sistematicity* in dealing with problems, maintaining the communication at such a representation level to consent, in the Domain in action, the use of messages in which the *semantic content* be correctly obtained by the transformations, on the messages themselves, done by the means in use.

The *Instructors* (Teachers) at the time of introduction of *Writing* considered it not adaptable to the individual necessities of the students and they even thought that *teaching* would be less stimulating and interesting and the effects of Writing *dehumanizing*. Besides this, the Educators at the time of the invention of the *Print* (about 20 centuries after) affirmed to have serious doubts on the Didactic value of such means, advising its suppression (remember the Edict of the University of Paris that prohibited its use) and advised against the adoption of printed material for didactic use. The benefits of the *Book* in the Educational System started to be seen in the 18th century. It entered School in an extensive way consenting, in the century after, to realize the School for all. Writing and Print, as revolutionary technologies and methodologies permitted therefore the base of School, consenting to define the known objective of: Reading, Writing and Making Believe, which from the 20th century will be combined as: Reading, Writing and Informatics, to become in the 21st century: Reading, Writing and ICT. Is it just a personal point of view? I'm sure that some readers will share this opinion!

The School for all replaces the individualized Instruction introducing the concept of Class, based on the principle that the Teacher addresses a *Group* (the Class or Listeners), hypothesized homogenous in relation to the beginning knowledge and to the capacity of learning.

The experience showed that often the subjects discussed and the didactic materials used in a *Class* are, for a part of it, of a level too low while for the rest of the Class turns out to be at the limit of their individual capacity or even unachievable. A finer taxonomy would lead to the division of the Class in more then three parts raising the doubt that the school systems have achieved their limit of formation capacity. The *Technological Revolution*, considered third by importance (after Writing and Print), can and must contribute to the effective improvement of the Formation System above all at the *Methodological* level. The ICT are at the center of this revolution and because their evolution don't give signs of stabilization, due to the fastness in change and innovation, it is impossible to preview how the Formation Systems, either scholastic or not, will be influenced.

The problem could be put this way: criticism can be put forward but one cannot think that the *didactic methodologies* will not be influenced, on the contrary, given the development of technologies, it will be necessary to explore more and more the possibilities to be able to make the most of the formation processes.

But the FUTURE always comes from far away.

The first designer in history of Didactic Technologies can be considered the Missionary Monk Raimondo Lullo who projected and carried out a Table system to teach the Christian Religion to the Black Muslims with the purpose of converting them. One can read that his students burned him alive. Lullo's idea was based on the conviction of being able to build schemes to mechanize the logical reasoning: idea picked up by Leibniz almost four centuries after, even if not for didactic purposes in a very explicit way. The logical Leibnizian program in fact is based on some essential points:

The setting up of an alphabet of the human thoughts where the signs, elementary thoughts experiments, could be combined in a language of universal characteristics capable of expressing all the complex thoughts (*ars inveniendi*) or, as Leibniz said: "*as Ariadne's thread, that is, a concrete way, perceptible with the senses that serve as a guide to the mind, like the geometrical lines and the forms of the operations that are taught to the students in arithmetic*".

The construction of a *calculus ratiocinator* to reduce all the logical processes to mechanical manipulations of signs, giving an instrument for the *ars demostrandi* and for *ars iudicandi*, or rather the capacity of deducting logical truths and of evaluating the truth or falsity of a proposition.

This demonstrates the idea of using the same algorithmization for logic as for arithmetic calculus; better still, Leibniz tries many times to "arithmetize" reasoning (we recall the title of his work: *Modus examinandi consequentias per numeros*).

Skipping the whole story of the Learning Machine (Pressey, 1920), the many conceptions of Linear Programmed Instruction (Skinner), Branched Programmed Instruction (Crowder) it is with the concept of answer choice, on behalf of the Student that a combination of elements of different nature starts to take shape, often auto integrating and complementary (book, sound, pictures, speech, television, elaborator and more) introducing the possibility of control and of feedback.

The Electronic Elaborator as a system capable of combining signs, independently of their meaning, to obtain new signs experiments the representation of a new meaning, stimulates ideas of development of Programs (Software Systems) that aim Teaching: teaching becomes the basic problem.

The data that the Program can use and its symbolic representation which at priori doesn't permit the Machine to know what it means, are at the center of all attention.

These could be numbers, words, text in an opportune and definite language, the representation of speech between man and machine, the explanation of a concept as well as the definition of a fact or a group of facts and the relations between them on which the program becomes the element that dynamically constructs a new fact, as deduction, induction, inference or other from the Universe just described.

All of this is fascinating and Daniel Pham almost prophesized it in the book *Informatics in Teaching* (Armando Editore, Roma, 1972).

He wrote: "*To characterize the second half of the 20th century the future historians*

will say, without doubt that it inaugurated the Calculator Era and see a new Science coming to be: INFORMATICS. It is not easy, he continues, to define in a few words, clarify in a few sentences what Informatics is. Like for every new Discipline, its limits are not well defined and the specialists do not agree on what it should cover. Maybe it is still in gestation and maybe the PROFESSORS that spy through the pain of delivery, the arrival of the newborn, anxiously ask themselves not if the baby will live but rather if its growth will be so fast as to worry its parents".

Alfio Andronico

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