A PROBABLE MAPPING BETWEEN FORTIC MODULAR ARCHITECTURE AND A PARTICULAR IMPLEMENTATION OF THE CONSTRUCTIVISTIC EDUCATIONAL PERSPECTIVE.

Critical considerations for effective application

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Abstract

Some difficulties which appeared during the development of the Fortic project courses, led me to examine carefully the underlying methodological pattern in order to understand the causes.

I propose a probable mapping between the architecture of the Fortic modules and a well-known implementation of the constructivistic educational perspective.

Starting from the knowledge of this educational approach, in both its positive and negative aspects, I suggest tactical recommendations for an advisable (?) strategic correction.

The results achieved can be considered positive.

Introduction

Fortic, a giant national plan for training teachers in information and communication technologies, is being carried out in our country: it concerns teachers of all subjects and all school-levels, from primary to high school. The Ministry of Education, MIUR, set up this plan in 2002. 20% of teachers are expected to follow the first part of this plan: that is, about 180,000 teachers from 3,000 schools and more than 9,000 tutors all over the country. There are three levels of courses which are divided into modules. All the modules have the same architecture and are implemented in four phases: the first phase, lasting two hours, consists of on-line self-training; the second phase, a three hour session in presence (?); the third phase, lasting four hours, is on-line self-training and finally the fourth phase, another three hour session in presence. During the on-line self-training, which can be carried out anywhere, the teachers can rely on the technical advice of a counsellor: one of them will be in each school. When teachers are asked to attend the lessons in presence, which are carried out in one of the school's classrooms or in a lab, a tutor is foreseen. The guidelines of the project are explicit about the tutor's role: "tutors are mainly called to stimulate, to administrate and to control the processes rather than to transmit knowledge" (M.I.U.R. 2002). Moreover every student can make use of a large e-learning platform, accessible through a password from which he/she can get information, create virtual classes and consult a large amount of material.

A survey carried out by the CSA (Administrative Service Centre) in Reggio Emilia about the progress of the project in its initial phase has shown that many students are worryied and uneasy. The most frequent complaints are generallyabout courses in which tutors only told the students to sit down at the computers, go to the suggested web-site and surf the net. The tutors were only available for advice or suggestions. This gave me the right input to reflect on the structure and the operative directions / operating instructions/ proposed for Fortic in order to find out the underlying didactic strategy. The analysis of the methodological elements of each module brought me to

think of a probable mapping between the phases of the Fortic modules and the didactic phases of a constructivistic model, which I had already explored in other educational experiences. This “discovery” made me curious and increased my desire to investigate thoroughly the application of the identified model, looking for its weak aspects (observed during my previous experiences or pointed out by the literature).
Finalmente ho ipotizzato una lettura e/o applicazione del modello che, nelle realtà corsuali da me controllate, ha prodotto gli immediati ed attesi effetti positivi.
Finally, I thought of a reading and/or an application of the model that was able to produce immediate and expected positive effects in the courses I was asked to evaluate.

The constructivistic model

It is known that the constructivistic educational paradigm states that man constructs all knowledge in his mind and that learning happens when he constructs both the mechanism for learning and his own unique version of the knowledge (Sfard,1998; Willis,1995). In this perspective the teacher can be seen as a “facilitator”, a co-operative resource in a learning process that happens mainly by discovery.
The constructivistic model seems to be closer to students’everyday experience, more person-centred, more respectful towards multiple intelligences, less apart (?) from the rhythms of today (?). One of the most popular sequences of application of the constructivistic methodology (Alessi and Trollip 2001) foresees a development in four phases:

1. Learning as discovery
2. Presenting information
3. Practising
4. Assessment

The first phase, learning as discovery, represents the first, basic moment /phase/ of the learning sequence. It is the moment in which the student goes deeper into the discovery of knowledge, builds his own way, chooses the sources, proceeds by induction, learns from his mistakes and gets nearer to the goal by additional approximations. It is in this moment that the teacher’s role becomes invaluable: he offers himself as a guide, helps the students when they follow misleading ways, stimulates those who try to hide behind the others because they are not interested. This is often the real picture of a classroom.
The second phase, presenting information, foresees that students share with others the information acquired during the phase of learning by discovery, that they make it explicit in groups or present it to the whole class. This involves a sort of collective brainstorming. Then comes the time to put order (?), to rebuild the ideas (?) and to reorganise their own thoughts. If in the phase of discovery the teacher is important as collaborative resource and soft guide, the role of an expert teacher is decisive when presenting information.
This is a prelude to the crucial third phase of practicing. The information, to be acquired, needs to be experimented, to be put into experience [In order to be acquired, information has to be directly experienced(?)]. The acquisition of speed, fluency and retention is assured only if there is a powerful practise phase.

All this needs a suitable conclusion: the assessment phase. It consists of a reflection on the preceding three phases of the process in order to evaluate their effectiveness and establish the right adjustment for future intervention (?). It is also the moment during which students are to be evaluated. As to the students' evaluation, the topic becomes more and more difficult and I don't want to go into this question that I consider dangerous and difficult and worth of being discussed more deeply(?). [I have no intention of examining the whole question of student evalution at this stage as it is a difficult, controversial topic which would require a much fuller discussion than is possible here.]

The Fortic mapping vs constructivism

Given this constructivistic model and the Fortic module structure I suppose the following mapping:

Fortic module structure		**Constructivistic model**
Two periods online	⟷	Learning by discovery
Three periods	⟷	Presenting information
Four periods online	⟷	Practicing
Three periods	⟷	Assessing information

The two online self-training periods attended by all students can be experienced as a period of learning by discovery. Doubts are subsequently sorted out and the knowledge acquired is presented in the classroom. Here with the help of the tutor the phase of learning by discovery proceeds starting from "situations", doubts are explained and knowledge is reorganised. Later on during the four periods of self-training the student tries solutions of new situations (?), to end up with a final moment of three periods in the classroom where all doubts are cleared up, the contents of the whole module are studied in depth and students face /undergo/ a period of assessment. Everything starts from a wide use of online materials.

In some Fortic courses it has happened that tutors have conceived the moments in presence (?)as an extension of the self-training moments, thinking that the e-learning platform on its own is sufficient for effective, complete learning. That is why we propose an extra analysis to understand the limits of the model and to suggest a correct application.

Limits of the model

The sharers (?)of these courses are teachers /The course participants are, of course, teachers/, many of them with considerable experience. Whether they are aware of it or not, they mainly use behaviourist or cognitivistic models (direct instruction). They are therefore not willing to carry out, even as students, different ways (of constructivistic inspiration) because they consider them de-structured and, as such, a source of uneasiness. Many teachers of this kind have a good ability with computers, but there is probably the same amount, above all among those who attend the basic courses, who completely or almost completely lack technical skills: this means that during the self-training phase, they tend to concentrate more on mastering the new technologies rather than the contents of the module.

The methodological constructivistic frame presented is largely shared in the literature concerning the subject. This doesn't mean that it cannot be criticised. During a recent seminar I asked Howard Gardner what he thought about this approach. He answered

that “Constructivism is the best of all the educational strategies, but it is also true that it is the most difficult to apply. In any case an exceptional teacher is required. Considering these premises I sent my children to non-constructivistic schools.” Except for an improbable error in translation, this was Gardner’s unequivocal opinion.

Last but not least, the complexity of learning from computers has a strong weight. This is the kind of learning adopted in the phases of self-training and not only there. I dare not enter into the eternal debate on the relationship between technology and education and I would like to warn about having big expectations from the use *tout court* of computers instead of teachers because these expectations would be very soon disappointed. By this I do not want to ignore the contribution that computers can give to teaching processes: in this context it would be paradoxical. I would rather stress the fact that insertion must be done through specific courses with the fundamental contribution of the teacher and above all, as Jonassen says, we must not expect to learn from computers but to learn with computers. (Jonassen et al 1999)

The proposed solution

This should be enough to guess how the application *tout court* of this model in the Fortic context might be dangerous and destined to fail. I think that it is necessary to introduce the right corrections and suggest a mixed solution that may integrate some elements of a more traditional approach to the presented constructivistic model (direct instruction). The following indications try to avoid being over-confident regarding an absolutely effective solution, as I am aware that in every context the didactic sensitivity of the teacher-tutor will lead him/her to choose the best strategies.

1. The two hour phase of online training, that we have said corresponds to learning as discovery, must be preceded by accurate anticipation by the teacher-tutor. It is not possible to leave the students alone to explore a totally new theme and think that in two hours he will be able to acquire meaningful knowledge to share and discuss. At least two of the factors on which successful discovery learning hinges have to be guaranteed: the possession of the necessary pre-requisites to face a new module and a structured path that makes it possible to proceed logically towards the wished (?)discoveries (Ormrod 2001). The teacher will have to take care, at the end of each module, to pave the way for the following one.
2. The first training in presence(?), lasting three hours, must be faced with an approach that gives the teacher a central role. The teacher collects the results of the two hours self-training and starting from these he gets into solving the doubts, reorienting the students and reorganising the contents. He then has to present new ones: some of them can be induced starting from guided exercises but some of them must be presented *tout court*, also with moments of frontal exposition /direct teaching/. It is necessary to remember that during these three periods the themes of the module should be planned and developed. For modules like the ones taken into consideration in Fortic it is not possible in three periods to succeed in inducting all the contents by discovery. The practical suggestion to tutors is to take advantage of the strategies for improving communication in the inevitable (?)moments of expositive didactics (?). I refer in particular to “advance organisers”, to connections to prior knowledge, to conceptual maps, to tools such

as visual aids and markers to gain the attention of the students, and I suggest appropriate pacing and always concluding with organic summaries. The stuff to be treated is extremely rich, so that even a lot of tutors are upset (??). So the tutors must make choices and must communicate these choices in a clear way to the students, who will be orientated both in the last part of the second phase and, above all, in the third phase.

3. It is the right time for practicing. It is time for a deep learning. “Skills to do come from doing” states an English old adagio. Nothing is truer than that. In this second moment of self-training the teacher/student will be able to apply the instructions that he was given. Only in the case of a partial or complete positive result will he have the perception of the effectiveness of the learning event. The tutor must be aware of this and he must never leave the student alone, on the contrary he must prepare his way (?)very carefully. A student will easily be able to apply the acquired knowledge if he was given numerous examples and also if he was given the opportunities to apply it in many different contexts (Reimann & Schult, 1996).
4. The last phase of the formation in presence (?)corresponds to the assessment phase in the constructivistic model. Because of the peculiar context and the short time available for every module it is obvious that this must be a formative assessment in the strict sense of the word: it should be a time of reflection on the themes treated and on the level of acquisition reached, which makes it possible to deepen, clarify and to orientate didactic decisions later on.

Conclusion

An attentive examination of the architecture of the Fortic project’s modules has led me to propose a probable mapping with a constructivistic model. The knowledge of the positive and negative aspects of this model, both from the literature and the direct experience has given me the opportunity to make suggestions that, where applied, have given positive results.

We hope there will be further assessments.

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