



Flipped Inclusion: Theoretical and Experimental Framework for an Augmented Classroom

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Abstract

At the University of Salerno it is in its third year of experimentation an interdepartmental research project entitled "Flipped Inclusion: theoretical and experimental framework for an augmented classroom". The concept of Flipped Inclusion serves to decline one of the possible uses of Blended Instruction, that is, the use of technology to make available to students the materials on which to carry out learning activities before of confronting with the teacher. Lesson is Flipped because it just reverses the usual order of teaching actions: traditionally students get the information with a lecture and they study at home, in the Flipped Lesson students will get information by freely exploring the selected materials, and then they will interface with the teacher.

Educational strategies of problem solving, learning-by-doing and reflective learning complement and support the flipped approach: at the center of educational process there is an activity, learning is first hand experienced, is directly collected by the student, matures through the execution of a task and is, finally, reshaped through a process of discussion and correction guided by the teacher.

In this conceptual framework, the research develops addressing the instructional design concept, deepening the idea of inclusion as valuing differences, describing the potential of inclusive flipped methodology and presenting a concrete case of design and development of educational activity.

1. Introduction

The concept of Flipped Inclusion serves to decline one of the possible uses of Blended Instruction, that is, the use of technology to make available to students the materials on which to carry out learning activities before of confronting with the teacher. Lesson is Flipped because it just reverses the usual order of teaching actions: traditionally students get the information with a lecture and they study at home, in the Flipped Lesson students will get information by freely exploring the selected materials, and then they will interface with the teacher.

In this way, the student does not simply incorporate information from his teacher and then study them, and at the same time the teacher does not exhaust its function in providing that information through the lesson[1].

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The teacher's expert knowledge, in fact, is fully availed to the extent that is asked by the students involved in problem solving, called to provide a competent point of view in discussing a case.

The idea is processed by Mazur [2], at Harvard University, in relation to the function of technology in the learning process. Later, several contributions using the terms "inverted instruction" or "inverted classroom" [3], or "classroom flip" [4]. Finally, the idea of flipped learning enters into common usage in the form of slogan: "Flip your classroom!".

Originally, the project in progress at the University of Salerno was born in the context of training courses for future teachers (TFA) and was aimed at establishing and maintaining an online practice community oriented towards flipped classroom model, inside which produce knowledge, tools, resources for teachers. The idea was inspired by the work and theories on communities of practice Wenger [5]. Specifically, we can define a community of practice as a social group that has the goal of producing knowledge and qualitatively significant organized around a specific theme, putting himself at the disposal of the group and by sharing this with their knowledge, research and experience, with the end of a collective improvement of the group from a strong awareness of their knowledge.

The proposed training program was aimed at educators and teachers to generate awareness about the communicative potential of digital media and Web 2.0 (messaging, social networks, blogs, Forum,

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cell phone ...), with the aim to represent and build knowledge through the lesson with the technologies. The technologies are not just instruments, but constitute a cultural system and a real growth environment for children and teenagers, already competent in the use with regard to its technical aspects, but often to drive the development of creativity, critical thinking skills and awareness about the authorial and social potential of media languages.

In this perspective, the course was designed to provide teachers with the tools to structure a path through the integration of media in teaching / educational practices, through an integrated approach that combines attention to the depth of the middle class situation and knowledge, without chasing easy technological enthusiasms without reflection.

The temptation of technological determinism (technology as a panacea for the ills of teaching and the road to the future for the school) produced effects in terms of methodology, favoring "an appropriation [of] technology by operating frame of the lesson 1.0 (super-instrument of representation which supports the teacher in his lectures)" [6].

In recent years, a greater critical awareness in education and commitment, significant and largely voluntary, sustained by teachers in the direction of digitization, on the one hand, and the evolution of technologies towards the personal, social, on the other, they have outlined a possible moment of overcoming of the ambivalent relationship established between education and ICT, a "reasonable consensus on some possible points of contact between the potential of technology and methodological quality" [7].

In this context, emerges the keyword of mediation, in the sense of the "translation" of cultural objects (forms and texts) within environments and tools that enable their functional articulation, and in the broadest sense of the sharing of experiences, the creation of communities practice.

Above all, emerges the necessity of mediation as osmosis of skills, such as shared work of design, modeling and implementation that can not be achieved by separating the spheres of competence of the pedagogy and teaching from those of technology and computer science.

With Tchounikine, "all actors share the difficulty of understanding how to relate software dimensions and educational issues, in a context within which both technologies and learning theories evolve, and a field that is to a large extent an experimental field" [8].

The project " Flipped inclusion: theoretical and experimental framework for an augmented classroom " originates from these reflections on new learning scenarios and on the scientific basis of pedagogical activism, aiming to emerging training needs and educational avant-garde, with a passage from the logic of traditional models to a reverse action educational focus.

The path, in start-up phase at the University of Salerno, winds in macro and meso context designs, from which cooperative productions derive, contextualized micro designs as the result of the actions developed in accordance with general phases of Exploration, Concept, Design and Testing in the field. The proposed trial is peculiar implementation of the flipped method, because it is centered on overcoming the limits of standardization related to 'network usage, both on providing appropriate tools for decoding a critical and informed use of new technologies and contents offered by the community online.

The flipped classroom seems to offer, in other words, a teaching model of inclusive media education, such as to give everyone a conscious contribution to the "creation of shared culture". As part of the long and innovative history that has characterized the attention of the Italian teaching to the Special Educational Needs, the recent paradigm shift from integration to inclusion, also implemented at the institutional level, provides an opportunity for a rethink of Special Education, starting from the idea of difference as dear positive singularity in Deleuze and from the recognition of the teaching process - learning as adaptive complex system, able to change following the experience, composed of a large number of interacting parts in a nonlinear fashion that give rise to global behaviors. From this perspective, the difference appears no longer as a liminal condition, with respect to which the exclusion or inclusion are presented as extremes of a single continuum, but as decisive synthesis of complexity, as a by-complexity, "simple" because on the local situation, such birthplace of a singularity that is finally stabilized through variation.

2. A case study: Flipping Hard Sciences

Educational activities designed by the students of TFA (Pre-service teacher education) This activity is designed by adopting the Flipped-Learning methodology with the overarching objective of stimulating the development of computational thinking to solve problems by developing high order processes:

Analisi del problema



- Designing the Solution
- Implementation of the solution
- Verify the accuracy of the solution

The methodology of flipped learning puts in the center of the learning process the student, who becomes an active subject developing pro-social skills in group and dealing with peers in the design and implementation of solutions.

The methodology is divided into several phases, and each phase must be structured and programmed by defining the activities of the students and the teacher. In addition, at each stage of the teacher input it will be aimed at bringing out the qualities and specific skills of each student, encouraging inclusion.

Develop multidisciplinary activities are structured into the following phases

1. Exploring
2. Conceiving
3. Designing
4. Testing

The activities can take away from the interactive activities "Observe your world"



Figure 1 - Observe your world Scratch Project

1. Exploring

Teacher

In this phase, the teacher wants to bring the material of study students to reflect on different problem solving methodologies.

Students

Every student at home explores the material that was provided



Figure 2 – Material to study

2. Conceiving Teacher

The teacher supervises and supports the micro-group activities, through the assessment of the work produced on multimedia tools.

Students

Students come together in micro-groups and share ideas about individual results achieved in the exploration phase.

Activities:

- Generate ideas
- Organize and analysis of the collected ideas
- Evaluate the ideas collected
- Select the ideas considered effective
- Define the selected ideas
- Identify ideas to develop
- Use interactive tools and collaborative as MindMup, Wordpress, Blendspace

3. Designing Teacher

The teacher gives some problems to be solved by applying one of the proposed methods.

Students

Students apply problem solving methodology acquired to design a solution to the problem proposed. They can use multimedia tools to produce project plans (UML, flow chart).

4. Testing Teacher

The teacher supervision and directs the work of the students, following the process of implementation and verification of the correctness.

Students

The students perform the selected solution in the lab.

activities:

- Implement the selected solution
- Check the correct operation
- Analyze the strengths and identify areas for improvement
- Students will use various tools for the realization of the project:
- Scratch



- Snap

For documentation of the projects will also use

- Web pages dedicated to the students on this website
- Multimedia presentations with prezi

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