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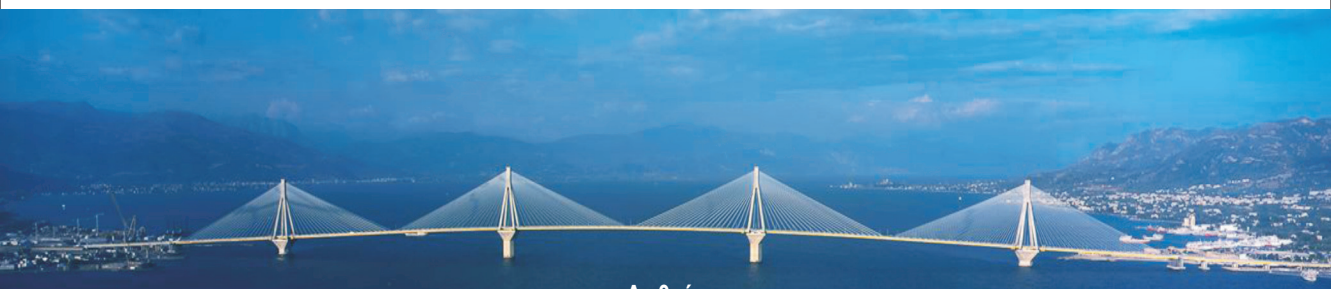

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Περιεχόμενα

Kotsalidou Doxa
Zografos Thomas

Knowledge and Aesthetics delight

Abstract

The title of this project combines mathematical knowledge with the Art lesson. The lesson of mathematics constitutes a primary and basic knowledge field at education, which is considered difficult and creates anxiety, not only to the educators but also to the students. On the other hand the art course constitutes a source of pleasure and creativity capable of eradicating possible competition and inequalities among the classmates. In the following chapter, we combine these–seemingly- different fields and we recommend the design and implementation of artistic activities, as a means of creative avocation between young children and mathematics.

Keywords*:* artistic activities, mathematical skills, interdisciplinary

Γνώση και Αισθητική απόλαυση

Περίληψη

Ο τίτλος της εργασίας συνδυάζει τη μαθηματική γνώση με το μάθημα των εικαστικών. Το μάθημα των μαθηματικών αποτελεί ένα κύριο και βασικό γνωστικό

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πεδίο στην εκπαίδευση, που όμως, επειδή θεωρείται δύσκολο, δημιουργεί άγχος τόσο στους εκπαιδευτικούς όσο και στους μαθητές. Τα εικαστικά από την άλλη, αποτελούν πηγή ευχαρίστησης και δημιουργικότητας και εξομαλύνουν τυχόν ανταγωνισμούς και ανισότητες μέσα στην τάξη. Στο κεφάλαιο που ακολουθεί, συνδέουμε αυτά τα –φαινομενικά- διαφορετικά πεδία και προτείνουμε το σχεδιασμό και την εφαρμογή ποιοτικών εικαστικών δραστηριοτήτων, ως μέσο για τη δημιουργική ενασχόληση των μικρών παιδιών με τα μαθηματικά.

Λέξεις-κλειδιά: εικαστικές δραστηριότητες, μαθηματικές δεξιότητες, διαθεματικότητα.

1. Introduction

Despite the fact that they have been faced as independent activities, Mathematics and arts are connected from the early years of development and the historical evolution, creating quite often mutual relations which enrich the mathematic activity, subjecting new fields of research. They affect the arts as well via, stimulating new regions of artistic orientation. Common procedures of mathematical knowledge and artistic works, such as observation*, analysis and synthesis, analogical reasoning, visual and graphical representation,* are some of the common characteristics between mathematics and arts[1].Given these common elements, we have designed and conducted a pilot action plan for first grade children, in order to prove that:

a. When children are involved in art activities, they simultaneously cultivate and consolidate a multitude of mathematical concepts and
b. The interdisciplinary connection of visual and mathematics can on the one hand result in pleasure and aesthetic delight and, on the other in the knowledge of the majority of the students, without discriminations and stress failure[2].

The reason that we have dealt with the link between these separate fields, is the current situation prevailing within the school community and the finding that: as far as the elementary school is concerned, despite the curricula, teachers are encouraged to deal with the individual subjects in an interdisciplinary manner. However we observe, that all the learning regions and teachers are being kept isolated almost, trapped among the program, the curricula and the limited time and that they are forced to use hours that are supposed to be used for arts on additional exercise on mathematics. Also another reason that we have dealt with this link is the way of trading arts within the classroom. The majority

1 Βάος, Α. (2008). *Ζητήματα διδακτικής των εικαστικών τεχνών,* Αθήνα: Τόπος.
2 Ζωγράφος, Θ.., Κωτσαλίδου, Δ. (2014). «Εικαστικά Βήματα με Μαθηματικά Σχήματα», *Παιδαγωγός*, Τετραμηνιαία διαδικτυακή έκδοση, http://www.neospaidagogos.gr/periodiko, ISSN: 2241-6781, τ. 2ο σελ.: 189-195, Ιανουάριος 2014, εκδόσεις: e-Πρωτοβάθμια – Αθήνα. (προσπελάστηκε στις 22/10/2017).

of teachers design and conduct artistic activities, paying attention and focusing only on the stage of creation of the children, being therefore unfair towards the works of art, the artists and the elegance, thus perpetuating an incomplete education at schools[3]. In the following sections we will refer to the teaching of mathematics and to each interdisciplinary field.

2. The teaching of Mathematics

The teaching of maths focuses on the teaching activities that are designed to teach mathematics[4]. Furthermore, its object is linked with the procedures of impartation and acquisition of different contents of this science, especially at school level[5].

The view that school mathematics is nothing but a set of predefined rules and different techniques that should be imported from the teacher to his students, has now been replaced by the notion that mathematics are part of the sustainable reality of children and this is how maths should be assessed and taught[6].

The teaching of mathematics differentiates the curriculum knowledge from pure mathematics, modifies and transfers it in the classroom. There are two types of teaching transformation: a. the transformation of scientific knowledge into teachable knowledge and b. the conversion of teachable knowledge into teaching. The first one refers to the transformations and adjustments which are applied to the scientific knowledge in order to make it a teaching object and the second one pertains to additional transformations of the teacher during his tutoring, where the teacher adapts the subject to suit his students. These transformations are essential because many studies have indicated that children are experiencing difficulties in learning school mathematics as their abstract and formal nature is very different from the intuitive and informal mathematical knowledge that children gain from their personal experiences[7].

As a result of the hard effort to transform teachable knowledge into a smooth teaching process, there is research in order to design appropriate mathematical activities, so as to develop genuine interest and productive speculation of children within the classroom. Also, a key component of modern teaching is the cross-curricular knowledge, where mathematics can be combined with other subjects and in that way various mathematical concepts can be taught by further triggering that will be provided in the context of visual arts[8].

3 Cole, M. (1996). *Cultural psychology:* A once and future discipline, MA, Cambridge University Press.
4 Brousseau, G. (1986). *Fondements et mıthodes de la didactique des mathıматiques*, Recherches en didactique des mathıматiques, 7.2, p. 35, ıditions la pensıe sauvage, Grenoble.
5 Artigue M., Doudy R. (1986). *La didactique des mathıматiques en France,* Revue franŋaise de pıdagogie, 76, Paris: INRP.
6 Brousseau, G. (1980). *Les obstacles epistemologiques et les problemes en mathematiqyes, Recherches en didactique des mathıматiques,* ıditions la pensıe sauvage, Grenoble.
7 Κολέζα, Ε. Μακρής, Κ. Σούρλας, Κ. (1993). *Θέματα Διδακτικής των μαθηματικών,* Αθήνα: Gutenberg.
8 Κοτοπούλης, Θ. (2007). Η διδακτική των μαθηματικών εννοιών στη βασική εκπαίδευση: Όψεις και

According to Lemonidis' researches, the student learns by acting. Learning cannot be a process where knowledge is given ready and is being absorbed by the student or is transmitted directly from the mouth of the teacher to the student. The teaching should be done in such a way that enables students to participate, be concerned, receive stimuli and interact with each other in order to achieve the "construction" of knowledge. Students must feel that mathematics is a human creation, useful and connected with life, which can be discovered and recreated by anyone. The student must find the learning content that is offered to him attractive and interesting and he also has to be able to act in it, to apply the knowledge he already has, utter thoughts, make assumptions and possible mistakes, implement methods etc[9]. In particular, teachers who teach young pupils are required to create such learning environments that investigative skills, problem solving abilities, reasoning and documentation skills, communication skills and semiotic action can be developed[10].

3. The teaching of Visual Arts

Education is a place where the various fields of knowledge are being entrenched and differentiated or must find ways to achieve a dynamic inter connection, while highlighting the limitations, the role and the special contribution of each. The quest for the teaching of art cannot stand outside such a basic question. A first differentiation point is found in art itself, which differs from science[11]. But the artistic practice can exceed all limits of "normal" shapes and ideas, creating new connections and unexpected combinations. As an eminently expressive activity, it signifies human experience, suggesting an attempt to give form to that which might otherwise have remained trapped in the separate life of each consciousness. It can awaken experiences and situations by triggering reflection and bringing new ideas[12].

The organized knowledge regarding the art phenomenon is not limited to the artistic heritage, but it also extends to the process by which visual forms are created, the investigation of the reasons why they are produced, the needs they serve, their role and function, the way by which visual forms are perceived and valued. Thus, a set of knowledge and practices, attitudes, behaviors, reflections and questions that accompany the artistic act is established. Therefore, the term

Προοπτικές, στο: *Επιστημονικό Βήμα του Δασκάλου,* τ. 7, σ. 142-156, ΔΟΕ, ΙΠΕΜ, Αθήνα.
9 Λεμονίδης, Χ. (2003). *Μια νέα πρόταση διδασκαλίας των μαθηματικών στις πρώτες τάξεις του δημοτικού σχολείου.* Αθήνα: Πατάκης.
10 Τζεκάκη, Μ. (2010). *Μαθηματική εκπαίδευση για την προσχολική και πρώτη σχολική ηλικία,* Θεσσαλονίκη: Ζυγός.
11 Bernard, H.R. (1994). *Research Methods in Anthropology: Qualitative and Qualitative Approaches,* CA: Sage.
12 Chapman, L. (1993). *Διδακτική της Τέχνης.* Προσεγγίσεις στην καλλιτεχνική Αγωγή. Αθήνα: Νεφέλη.

"teaching art" is legitimized in the same way as other teachings, as it refers to a wide range of approaches, requirements, designs, techniques and methods regarding the systematic activity, an activity which broadcasts the organized knowledge about art as a part of a teaching designed space, allowing the "conversion" of an educational intent into an educational action[13].

The art at school is not just a lesson, but an activity that develops creative thinking. Nevertheless, in our educational system, the contact with visual arts is underestimated and regarded as a recreational activity or as an opportunity to study other subjects e.g. children learn maths by using images, geography by consulting maps, natural history by painting animals or plants etc[14].

In the teaching of art we search for a process that a. creates an exploratory, participatory and collective framework, which promotes a deeper understanding, b. utilizes the experienced-experiential knowledge of children, c. creates a fertile, open and substantially pleasant, pedagogical ambiance and d. balances and connects the final result with the entire process of the creation[15].

4. Visual Arts and Mathematics

The history of Fine Arts, from its inception, is filled with magnificent creations based on the science of mathematics. Mathematics, although mostly considered as a logical - analytical science, has been used as an essential tool for creating works of art from antiquity to modern times[16].

From the ancient Greek and Byzantine art, the Renaissance paintings based on accurate geometric sketches, the ancient statues, which reflect the search for a happy medium, the patterns of geometric vases, the simple lines of Bauhaus, up to contemporary art with Mondrian, Kandinsky, Malevich, Rodchenko and others, it is proved, as Severini advocates[17], that if somebody tries to paint when lacking knowledge of the strict and fixed rules of mathematics, it is as if he wants to compose a symphony without knowing the harmonious relations and the rules of counterpoint.

These findings, combined with the many surveys and articles of some specialists in the relationship between mathematics and visual arts (Kotopoulis, Vaos, Magouliotis, Parisaki, Kooll, Severini, Welton, Kress, etc.)[18], but also with our own interest in both visual arts and mathematics in elementary ages

13 Αρντουέν, Ι. (2000). *Η Καλλιτεχνική Αγωγή στο Σχολείο,* μτφ. Μ. Καρρά. Αθήνα: Νεφέλη.
14 Κακίση-Παναγοπούλου, Λ. (1994). *Και όμως ζωγραφίζουν.* Αθήνα: Δελφοί.
15 Ζωγράφος, Θ., Κωτσαλίδου, Δ. (2016), *Τέχνη και Μαθηματικά.* Φλώρινα: Πετρίτης.
16 Gillings, R. (1972): *Mathematics in the Time of Pharaohs*, Cambridge. Mass: The MIT Press
17 Severini, G. (1921). Dal cubism al classicismo, Altri sanggl sulla sivina proporzione e sul numero d' oro. Paris.
18 Παρησάκη, Θ. (2004). *Φιλοσοφία & Τέχνη,* Θεσσαλονίκη: Ζήτρος & Welton, J. (1994). *Dorling Kinderley Limited,* London: Text Copyright. & Kress, G. (2003). *Literacy in the New Media Age,* London: Routledge.

have prompted us to design and implement the present investigation in order to prove that all the major mathematical concepts which are proposed by the new curriculum[19] for this age can emerge and be cultivated through visual arts.

This teaching approach promotes the design and the implementation of activities arising from the combination of art and mathematics. The mathematical concepts that children are taught, such as *the point, the line, the geometric shapes and solids, the symmetry, the sets, the numbers and operations between them*, etc. are also found in a variety of ways in the visual arts and are regarded as fundamental visual elements for the design and creation of artistic works. We believe that art education achieves the initiation of young people in the creative process and offers a new way of vision[20]. It teaches children how to capture multidimensionally the world that surrounds them. In addition each child that creates something, feels the excitement of the free expression. Furthermore, it mobilizes the cultivation of imagination, knowledge, psyche and capability. The discovery of this relationship offers children the opportunity to experience, on the one hand, the beauty of the aesthetic that is offered by art and on the other hand, to develop logical-mathematical thinking during their occupation with the science of mathematics and, on top of that, the teaching of art highlights the sociocultural dimension of school, since it excludes the element of rejection and encourages the active participation and cooperation of the children[21].

5. The research

To prove that the interdisciplinary collaboration of art and mathematics can bring positive results in two separate fields, we took into account the scientific and pedagogical concepts have been previously mentioned for the fields of art and mathematics and at the same time, we tried to achieve through a Teaching Intervention, a fertile combination of Visual Arts and Mathematics. For this purpose, we have designed and implemented for the first grade of primary school, 43 art activities, which include the basic teaching principles of both learning areas in an integrated teaching and methodological proposal. The teaching intervention consists of organized teachings which typically belong to the learning area of the visual arts, but also reveal fundamental mathematical concepts appropriate for Elementary First age.

19 ΝΕΟ ΣΧΟΛΕΙΟ, (2011). (Σχολείο 21ου αιώνα) – Νέο Πρόγραμμα Σπουδών, Οριζόντια Πράξη» MIS: 295450.

20 Ζωγράφος, Θ., Κωτσαλίδου, Δ., Παπαδοπούλου Χ. (2014). Μαθηματικές ανακαλύψεις μέσα σε έργα τέχνης, στο: 5ο Συνέδριο ΕΝ.Ε.ΔΙ.Μ: *Τα μαθηματικά στο σχολείο και στην καθημερινή ζωή,* ISSN: 1792-8494. Π.Δ.Μ., Φλώρινα, 14-16 Μαρτίου.

21 Verschaffel, L., Luwel, K., Torbeyns, J., & Van Dooren, W., (2009). Conceptualizing, investigating, and enhancing adaptive expertise in elementary mathematics education. *European journal of Psychology of Education,* 24 (3), 335-359.

The research that we have carried out was: a. Applied, because it had predetermined practical purpose and aimed at practical application of scientific knowledge and theories, b. Action Research, because it followed a predetermined plan, identifying certain variables (learning objectives) and sought the participation of all the training team members in the educational process[22]. Team members participated fully and equally in the experimental process. The research was based on three main assumptions:

a. That the approach of an artwork is reached through the Mathematical concepts,
b. That the students apply mathematical concepts when experimenting and creating artworks and
c. That when evaluating the approach of an artwork and the construction of a children's creation, children identify and understand mathematical concepts and symbols.

This research lasted an entire school year in a particular class of first graders (case study). It was implemented in the natural environment of the classroom, and at the end of it we exported many conclusions, comparisons and measurements of the findings. In order to analyze the results, we used primarily the semiotic analysis[23] and we detected the visible dimension of the projects through their materials, colors, design, composition and content.

The content of the material was classified into categories, consolidated and analyzed over the visual and mathematical axes which are proposed by the new curriculum for the Elementary First age. With the semantic analysis of children's creations we recorded and brought out the visual and mathematical concepts that emerged through the art activities. We recorded each teaching (with photographs of our experimentations and children's projects and by recording the children's comments). Afterwards, with the help of semiotics, we analyzed, a. The participation and the comments of all children throughout the activities, b. All works that were created by the children, delving into the particular "signs" which revealed the requested "meaning" of the pilot project in terms of the visual and mathematical concepts that emerged.

5.1. Results

The content of our material was classified and coded in 11 categories and analyzed in relation to the 6 artistic and five mathematical axes which are proposed by the new curriculum (2011).

22 Denzin, N. K. & Lincoln, Y. S. (2003). *The Landscape of Qualitative Research.* Thousand Oaks, California: Sage Publications. & Erickson, E. (1986). Qualitative methods in research on teaching. Στο M. C. Wittrock (Ed). *Handbook of research on teaching.* New York: Macmillan, (pp. 119-161).
23 Belting, H. (1990). *The image and its Public in the Middle Ages,* New Rochellem NY: Aristid D. Caratzay. & Hill, J. (2005). *Introductory Phisics,* London: Macmillan.

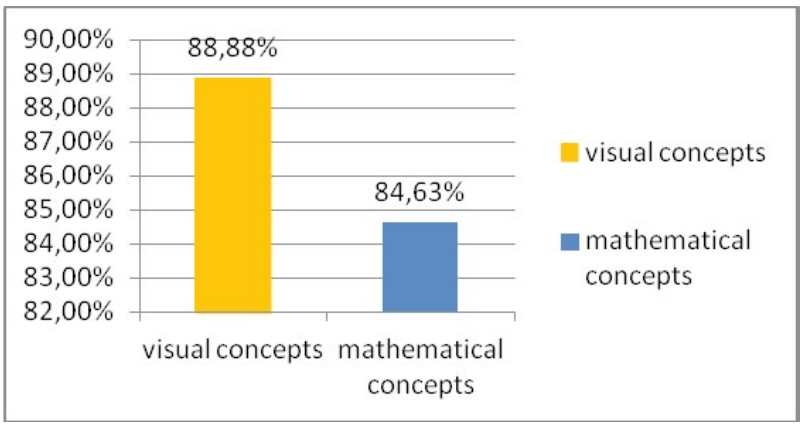
The 11 categories are:

a. visual: 1. Materials, Instruments, Techniques. 2. Morphic elements. 3. Subject. 4. Forms of visual arts. 5. Artwork. 6. Introduction to aesthetics. And
b. math: 1. Numbers and operations. 2. Introduction to algebraic thinking. 3. Space and Geometry. 4. Measurements. 5. Stochastic Mathematics.

With this teaching intervention we proved the direct link of visual arts with mathematics, in all axes / tracks and in all subject areas proposed by the new curriculum for the first grade. It turned out that through art, all major mathematical concepts proposed by curricula for Elementary First age can be emerged and cultivated.

The interpretative analysis of data demonstrated that the art activities that were carried out, in their entirety, entailed the 6 pillars of artistic education in percentage 88.88% and the five pillars of mathematics in percentage 84.63%, as it is illustrated in Figure 1:

Figure 1: The connection between art activities and the axes of visual arts and mathematics



We can see that a small percentage difference of 4.25% is recorded, regarding the correlation of visual art activities with visual and mathematical concepts. The above finding allows us to consider that: "By designing and implementing quality art activities, simultaneously and in parallel with the concepts of art education, we also cultivate, develop and practice various mathematical concepts which are included in the new curriculum (2011) for mathematics of first grade class". Below, we present a small sample of the teaching intervention, which reveals the learning process and the emergence of mathematical concepts through art activities.

5.2. An indicative visual activity

The design and implementation of the activity was based on these three principles

a. Approach of artworks
b. Experimentation and Creation and
c. Results - Rating

METHOD: demonstration of the teaching materials (artwork), observation, description, discussion, reflection and experimentation.

MATERIALS: two artworks of Giannis Kounelis and Alighieri Boeti, a PC and a projector, pencils, markers, tempera, white papers and cardboards.

a. Approach of artwork: when approaching a work of art, the child, sometimes as a creator and sometimes as a spectator, uses the visual language that is composed of morphic elements (point, line, shape, form, light, tone, texture and space), which are directly related to the science of mathematics[24]. The children approached the works and described the colors, shapes, forms, addresses, letters, symbols, etc. (Table 1.).

Table 1. Artworks approached by the children, as well as visual and mathematical concepts that emerge through them.

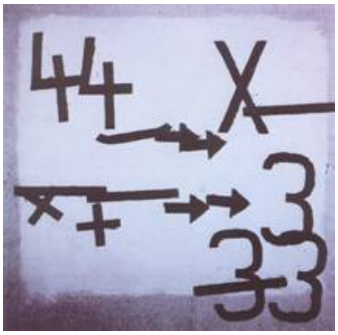


Fig. 1. Giannis Kounelis 'Untitled'

Visual concepts of projects

Compositions in black and white, squared surfaces with many colors. Lines, shapes, colors and symbols. Positions, addresses and routes in the area.

Fig. 2. Alighieri Boeti "Untitled"

Mathematical concepts of projects

Numbers and symbols, squared surfaces, measurements, calculations, operations (addition, subtraction, multiplication, division). Positions, addresses and routes in the area.

24 Μαγουλιώτης, Α. (2011). «Εικαστικές Δραστηριότητες ζωγραφικής και απόψεις των νηπίων», στο *Τέχνες & Εκπαίδευση,* πρακτικά Διεθνούς Συνεδρίου, σελ.118-124, Αθήνα. & Καντίνσκι, Β. (1996). *ΣΗΜΕΙΟ, ΓΡΑΜΜΗ ΕΠΙΠΕΔΟ,* μτφ. Έφη Μαλάκη - Σταθάκη, Αθήνα-Γιάννενα: Δωδώνη.

The teacher: displays the works of artists (Fig.1 & 2) and invites children to observe, describe and submit their views and their own experiences. For fig. 1 .: [which numbers do we see? What symbols? Towards which direction do the fours, threes, arrows look? Towards which direction does symbol X look? Or is it still? What title would you give to the project? etc.]. For fig. 2 .: [what does this painting show? How many squares are there in the bottom line? How many in the top line? How many squares has the line from top to bottom? Do you know the letters? Are they in Greek? Could we play with the numbers? What title is suitable for this work?].

Children: they observe projects and recognize the symbols, numbers and letters, as well as the color games. They count the squares, find the equations (they recognized all Kouneli's symbols, they realized that Boeti's symbols are not greek).

The teacher: invites children to create –just like artists do- works with numbers, letters and symbols (a white A4 paper divided into four equal parts. In Ό they depict letters, in Ό, numbers, in Ό, symbols and in the last fourth all together.

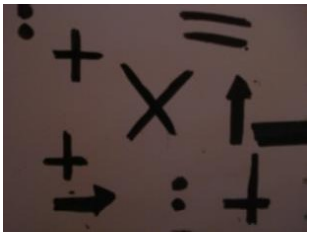
b. Experimentation and Creation: For researchers Langer[25] and Dalley-Cas[26]e a.o. the artistic creation becomes a pedagogical activity that reflects the inner world of the child, yet nurtures and develops thinking. It is the most creative moment of the learning process where children are trying to use lines, shapes and colors to synthesize various forms, create, design, draw, build images and anything that their imagination captures, edits and creates and anything their thoughts dictate. The children, having approached and come in touch with the works of artists, proceeded to the next stage, which was their own experiments (Table 2).

c. Assessment: According to Tzekaki[27], this phase is very important because of two influential objectives: on the one hand, when children express an idea, a structure or give an explanation in words, they mentally reproduce their action and organize their thinking, so as to realize the idea, solution, construction, etc. on an effective level. On the other hand, when they interact with adults or other children, they receive new meanings and explanations. These new meanings give feedback for the development of their own thinking.

Children presented and described the projects they created, inspired by the works of artists and understood in a pleasant and creative way, various mathematical concepts: shapes, rhythm, numerical symbols, letters, movement and the different directions, measurements, additions, multiplying conditions, etc.

25 Langer, S., (1957). *The Problems of Art.* London: Routledge.
26 Dalley, T.- Case, C. -Schaverien, J. – Weir, F. - Halliday, D. -Hall, P. N. - Waller, D., (1995). *Θεραπεία μέσω τέχνης.* Μτφρ. Γ. Σκαρβέλη & Ν. Αναγνωστοπούλου. Αθήνα: Ελληνικά Γράμματα.
27 Τζεκάκη, Μ. (2010). *Μαθηματική εκπαίδευση για την προσχολική και πρώτη σχολική ηλικία.* Θεσσαλονίκη: Ζυγός.

Table 2. Experiments of children with symbols, letters and repeating patterns

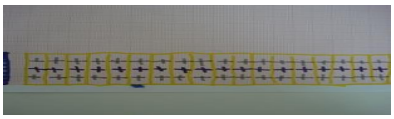


In their creations they are influenced by Giannis Kounelis work.

But then they are squaring their work as Boeti did.

Children also create in groups and experiment with symbols

Coloring and squaring their creations.



Some children only choose one symbol and repeat it

Others work more freely and on their own terms.

5.3. Comments on the artistic activity

From the recording and analysis of the three phases of the artistic activity, the following observations were found:

- All children participated enthusiastically in all three phases (approach of art-creation-evaluation project).
- In the phase of the artwork approach, children observed and described the lines, colors and shapes they saw, they identified the shapes (cylinders) around the fish, made sizes comparisons, perceived relations between shapes, identified

symbols, positions, addresses and routes into the painting surface, realized the repeating motifs (fish scales).

- In the phase of experimentation and creation, children experimented following the example of the artist and drew many fish with line repetition, shapes and colors in their own personal way.
- In the phase of reflection and evaluation of the activity, the children described the course and the result of their own projects, by using the artistic and mathematical terms they learned in the phase of the artwork approach.
- The visual concepts that emerged from this activity, involve all the visual arts education axes and allocated according to Table 3 as follows:

Table 3. Correlation of visual concepts with the 6 axes of A.P.

Visual concepts	
Axis 1 (simple materials-techniques)	Paper, pencils, markers, tempera, geometric patterns, P.C.
Axis 2 (morphic elements)	Points, lines, shapes, forms, colors.
Axis 3 (topic)	Human environment (letters and numeric symbols).
Axis 4 (forms of visual arts)	Drawing, painting.
Axis 5 (artwork)	The works of artists
Axis 6 (introduction to “taste”)	Use of visual concepts, expression of feelings and impressions, cultivation of the imagination, naming lines, shapes, symbols, description of relations, etc).

- The mathematical concepts that emerged from the approach of the artwork, the children's experiments and discussions and their descriptions, are related to all axis-tracks of mathematics and allocated in accordance with Table 4 as follows:

Table 4. Correlation of mathematical concepts with 5 axes of A.P.

Mathematical concepts	
Axis - track: Numbers and operations	Identification and enumeration of symbols, layout of lines and shapes.
Axis - track 2: Space and Geometry	Orientation of lines and shapes in space, geometric shapes, positions, addresses and routes, visualization and spatial reasoning.
Axis - track 3: Introduction to algebraic thinking	Regularities (line repetition, shapes, patterns).
Axis - track 4: Measurements	Comparisons and measurement of patterns and shapes, capacity.
Axis - track 5: Stochastic Mathematics	Using mathematical terminology and organization of newly acquired knowledge

Looking at the results of the target visual activity, we conclude that the following concepts were emerged and cultivated:

a. **visual concepts:** points, lines, shapes, colors, styles. Relations between shapes. Forms in different directions in space, with a strong element of motion. Positions, addresses and routes into the surface and pattern repeats.
b. **mathematical concepts:** points, lines, shapes, forms in different directions in space, with a strong element of motion. Positions, addresses and routes through the surface. Comparisons shapes, pattern repeats, symbols measurements etc.

We see eventually, that the concepts with which children came into contact, are similar to art and mathematics, except for color, which, in this case, refers only to the visual part of the activity.

6. Conclusions

The didactic intervention which was implemented in first graders, consisted of 43 hours of visual activities, which were designed and implemented according to the artistic activity that was presented exhaustively in the previous section.

In summary, the results of the entire survey showed:

a That when children of the first grade elementary school approach, a variety of artwork, they initially perceive morphic-components of the project, and then discover mathematical concepts that emerge from them.
b. When children experiment and create their own works, unwittingly, they put themselves in the process of measuring, calculating sizes and distances to construct a surface, to find points on a surface, compare sizes, lengths, widths, recognize shapes and special characteristics to create regularities, ie to apply, mathematical concepts. And
c. Through the evaluation of the activity, that is the approach of art and their own creations, they reflect upon, discover and deeper understand the mathematical knowledge throughout the learning process.

With the proof of the close and indissoluble relationship between art and mathematics, the following excuses of a teacher are cancelled:

a. For the difficulties faced by children in mathematics,
b. For the lack of time on the clock of the class program and
c. To circumvent the visual classes for further training of children in mathematics.

By designing and implementing visual activities based on the triptych:

a. Approach artworks
b. Experiment and create and
c. Evaluation and reflection,

emerged, with very high success rates, a cadet methodological way for the negotiation of visual activities, not only for the cultivation and development of mathematical concepts, but also for the cultivation and development of aesthetic education, imagination, creativity and critical thinking, that are requested in all learning areas of the curriculum and are necessary supplies for the developing human.

These findings offer one more indispensable tool in the hands of teachers and another chance, so as to turn the course of the visual arts, from "empty" or tutorial time, into a pleasant and creative pastime, when all students will equally discover, experiment, create and make findings (aesthetic and scientific), influenced by a work of art ...

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CALL and MALL research: from theory to practice

Abstract

This paper investigates three second language Acquisition theories and their application on research carried out in the field of Computer Assisted Language Learning (CALL) and Mobile Assisted Language Learning (MALL). Theories such as the sociocultural perspective, the interaction hypothesis, and situated learning are closely connected to the aims of each research, and suggest attitudes to different components and aspects of the procedure i.e. choice of media, engagement, and assessment. They further indicate the role of the instructor, the relationships formed, or the degree of interaction and collaboration among learners. Although theories have set the framework that has guided task design or research, they are mediated by the teachers' personal experience and inspiration and should sometimes be adapted or adjusted for a specific audience. On the other hand, it is learners' needs, learning styles and background that require different approaches.

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Έρευνα στο πεδίο της γλωσσικής διδασκαλίας με υπολογιστές και κινητή τεχνολογία: από τη θεωρία στην πράξη

Περίληψη

Το παρόν άρθρο διερευνά την εφαρμογή τριών θεωριών γλωσσικής πρόκτησης της ξένης γλώσσας και την εφαρμογή τους σε έρευνες στο πεδίο της γλωσσικής διδασκαλίας με υπολογιστές και κινητή τεχνολογία. Θεωρίες όπως η Κοινωνικο-πολιτιστική θεωρία, η υπόθεση της Αλληλεπίδρασης, και η θεωρία της Εγκαθιδρυμένης μάθησης συνδέονται άρρηκτα με τους σκοπούς της εκάστοτε έρευνας και προτείνουν τη στάση απέναντι σε διαφορετικά στοιχεία της έρευνας: την επιλογή της τεχνολογίας, του τρόπου εμπλοκής των μαθητών και αξιολόγησης. Επιπρόσθετα, προσδιορίζουν τον ρόλο του εκπαιδευτή, τις σχέσεις που διαμορφώνονται και τον βαθμό αλληλεπίδρασης και συνεργασίας των εμπλεκομένων. Παρόλο που οι θεωρίες καθορίζουν το πλαίσιο διαμόρφωσης και σχεδιασμού της έρευνας, αυτές διαμορφώνονται και επηρεάζονται από την προσωπική εμπειρία του και την έμπνευση του εκπαιδευτή και τροποποιούνται για το συγκεκριμένο κοινό. Τέλος, οι ανάγκες και το στυλ μάθησης των εκπαιδευόμενων απαιτούν διαφορετικές προσεγγίσεις

1. Introduction

The rapid growth of Information and Communication Technologies has affected all aspects of human life, including education. Teaching practices and learning have undergone tremendous changes in recent years as educators have attempted to capitalize on the potentials of technology. Computer assisted language learning (CALL) was defined in a seminal work by Levy[1] as "the search for and study of applications of the computer in language teaching and learning". Additionally, mobile assisted language learning (MALL) entails language learning that is assisted or enhanced through the use of a handheld mobile device. Through the use of ipads, cellphones and PDAs students are able to access language learning materials and work in a collaborative way by sharing the language learning process in small synchronous groups. Stockwell believes that "Theory, research and even practice in the field struggle to keep pace with these technological developments" [2]. In order to successfully utilize the affordances of the new media in the foreign language classroom, there is a need for a sound theoretical

1 Levy M. (1997) CALL: context and conceptualisation, Oxford: Oxford University Press, p.1.
2 Stockwell, G. (2014). Exploring theory in computer-assisted language learning. In X. Deng & R. Seow (Eds), *Alternative Pedagogies in the English Language & Communication Classroom: Selected Papers from the Fourth CELC Symposium for English Language Teachers* (pp. 25-30). Singapore: Centre for English Language Communication, National University of Singapore, p. 25.

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framework that will determine and orchestrate the language learning process and the impact of technology on it. Technology on its own is not a panacea that guarantees success. It should be implemented in a way that it reflects a scientific and professional approach on the part of the instructors[3]. Referring to one or another theory is not a matter of random selection. Theories are closely connected to the aims of the project, and suggest attitudes to different components and aspects of the procedure i.e. choice of media, engagement, and assessment. They further indicate the role of the instructor, the relationships formed, or the degree of interaction and collaboration among learners. An attempt has been made to examine three different Second Language Acquisition theories and the way they have been applied in different projects.

2. SLA theories

Theory has always held a key role in CALL and MALL. Practitioners have acknowledged the importance of a theoretical framework and numerous theories have been cited in the CALL literature over the past three decades. This chapter attempts to give a brief overview of some SLA theories in order to proceed with their implementation in the relevant field.

2.1. The sociocultural perspective

The basic principle underlying the sociocultural approach is that learning is the outcome of an individual's interaction with the world as it is defined by social, historical and cultural parameters. According to Lantolf & Thorne mental functions such as memory, logic thought, learning, and attention are reinforced by participating in culturally organized activities[4]. Learners learn while transforming their experiences and way of thinking based on previous knowledge. In a learning situation the teacher provides instructional scaffolding[5], that is, provides instructions and support regarding the completion of the task and as learners become more proficient, the teacher gradually recedes. Cognitive change occurs when using cultural tools such as physical artifacts or symbolic tools, such as language to interact with people. Language is the predominant mediation tool, which will serve more advanced purposes after internalization. Through inquiry-based activities learners are able to draw inferences and

3 Chapelle, C. A. (2009). The Relationship between Second Language Acquisition Theory and Computer-Assisted Language Learning. *The Modern Language Journal*, 93, 741–753. Retrieved from: http://www.jstor.org/stable/25612271
4 Lantolf, J. & Thorne, S. L. (2007). Sociocultural Theory and Second Language Learning. In. B. van Patten & J. Williams (Eds.), *Theories in Second Language Acquisition* (pp. 201-224). Mahwah, NJ: Lawrence Erlbaum
5 Schunk, D. H. (2012). *Learning Theories: An Educational Perspective* (6th ed*)*. Boston: Pearson

conclusions and negotiate meaning in a collaborative environment. Knowledge is co-constructed between people, peers, and teachers. Engaging in small group or large group discussions enhances deeper understanding, synthesizing ideas and fosters self- regulation while constantly reassessing earlier stages of knowledge. Learners practice active articulation of their ideas so as to reach a common goal and evaluate their cooperation in a mutually and socially agreed manner. The individual does not claim ownership of knowledge, as this is shared among social groups, establishing the notion of distributed cognition[6]. A teacher's primary aim would be to empower students by giving them responsibility, and by encouraging them to be self-controlling, autonomous, demonstrating reflective skills.

2.2. Interaction hypothesis

Krashen's original idea was that a great amount of comprehensible input is obtained when effectively communicating in the target language and endeavoring to make ourselves understood while exposed to a proper amount of listening and reading material[7]. The input hypothesis states that there two distinctively separate ways in becoming competent in a second language, namely, subconscious acquisition and conscious learning about the language. We progress if input contains structures above our current level. "We are able to understand language containing unacquired grammar with the help of context which includes extra-linguistic information, our knowledge of the world, and previously acquired linguistic competence"[8] Provided that input is understood and internally processed, grammar is automatically generated. Expanding on the input hypothesis, the interaction hypothesis advocates that language proficiency is achieved by face to face interaction and communication. The main tenet of interaction hypothesis is that language learning goes through different stages of exposure or input, production through interaction and feedback. "Modifications in the interactional structure of conversations which take place in the process of negotiating a communication problem" promote and amplify information understanding"[9]. The interaction hypothesis also focuses on the equality of interlocutors as a key determinant of meaning reconstruction. Drawing on the output hypothesis it claims that language learning is enhanced when learners are somehow forced to produce and modify their output employing a range of techniques, such as requests for clarification of meaning checking. Feedback is

6 James, M. (2006). Assessment, teaching and theories of learning. In J. Gardner (Eds), *Assessment and learning* (pp.47-60). London: Sage publications.
7 Krashen, S. (1985). *The input hypothesis: Issues and Implications*. London: Longman Publisher.
8 Krashen, S. (1985). *The input hypothesis: Issues and Implications*. London: Longman Publisher, p.2.
9 Ellis, R. (1991). The interaction Hypothesis: A critical evaluation. In E. Sadtono (Eds.), *Language acquisition in the second/foreign language classroom* (pp. 179–211). Anthology Series 28, Singapore: SEMEO Regional Language Centre, p.9.

therefore a crucial aspect as learners become aware of the discrepancy between the target language and their own performance.

2.3. Situated Learning

In their seminal work Lave & Wenger[10] have introduced the concept of situated learning. "Knowing is conceived as a way of acting within a community of practice"[11]. The main situated learning construct is that learning emerges as the outcome of personal encounters with different incidents affected by social interaction in the same context in which it will be practiced. Lave and Wenger state that "learning is an integral part of generative social practice in the lived- in world" [12]. Therefore the focus is not on the processes that generates knowledge, that according to cognitive theories it is an internal one, but rather on the social interactions that provide the grounds for learning to occur. Communities of practice are of paramount importance as they involve their members in common processes of talking and acting. The concept of legitimate peripheral participation (LPP) describes how learning enables individuals to learn from the more knowledgeable ones and assume a central and more functional role in the community. Knowledge is co-constructed, either deliberately or not, through realistic experiences and by taking part in gradually increasing in complexity tasks. What is acquired is not knowledge disconnected from context but "the skill to perform"[13].

The implications for SLA is that it should provide authenticated tasks in the settings in which they occur and provide ample opportunities to participate in communities with common interests and needs. In a digital era the model of learning through computers resembles the model of learning from an expert but at the same time it enhances interaction between individuals in multiple ways.

3. Implementing theory in CALL research

3.1. Sociocultural Theory in CALL

Gutiurrez draws on the Vygotskian tenet that learning is a "mediated process that originates in societal activity"[14]. The study was carried out in a Spanish as a foreign

10 Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.
11 Arnseth, H. A. (2008). Activity theory and situated learning theory: contrasting views of educational practice. *Pedagogy, Culture & Society, 16* (3), 289-302. DOI: 10.1080/14681360802346663
12 Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press, p.295.
13 Hawks, W, F. (1991). Foreword. In J. Lave & I. Wenger (Eds), *Situated Learning: Legitimate Peripheral Participation* (pp.13-24). Cambridge: Cambridge University Press, p.14.
14 Gutiurrez, G. A. (2006). Sociocultural theory and its application to CALL: A study of the computer and its relevance as a mediational tool in the process of collaborative activity. *ReCALL*, *18* (02), 230-251. DOI:

language classroom and focused on three problem–solving tasks completed by dyads in different mediums, computer-supported and non-computer-supported. Task design aimed at providing "a space for discussion and collaboration to reach common agreement and express their own thoughts"[15]. The objective of the study was twofold: to assess computer as a mediating tool and to investigate collaborative activity as the path to reform inter-language. Cognitive change takes place when using cultural tools in our interaction with people, the most prominent being language. Collaborative dialogue is the interface where using the language and learning the language meet. Other students' interventions and the collective experience empowers them to engage in a pedagogic exchange. What would otherwise be impossible to complete individually, made evident at the beginning of the task, is constructed through knowledge sharing and by supporting each other as equal "novices" or by getting help from an expert in what is called collective scaffolding. High quality collaboration (HQC) is a unit introduced by the author to enable qualitative analysis of interaction. Although all participants collaborated and there were no significant differences related to the amount of talk, a second level analysis indicated that not all talk was collaborative, as the nature of the tasks might have favored its implementation on one or the on the other medium. Even though task design was in accordance with the sociocultural theory, the writer proposes that the Vygotskian principles should be "cautiously explored and refined when applied to second language learning"[16].

Hampel & Hauck[17] investigated Lyceum which is a synchronous, interactive audio-conferencing tool created with the aim to provide on-line tutorials for level 2 German students. The Lyceum software enabled students to simultaneously hear each other and talk while at the same time a supportive course-related website was created, accessible to both students and tutors.

Sociocultural principles claim that learning takes place through problem-solving, collaborative learning and argue for "socially associated construction of meaning"[18]. During task design sociocultural aspects were combined with the interaction hypothesis tenets as suggested by the authors: a) exposure to modified input either written or oral was made possible b) opportunities for modified output, either written or oral in the same or in a different mode c) measures were

10.1017/S0958344006000620, p. 232.

15 Gutiurrez, G. A. (2006). Sociocultural theory and its application to CALL: A study of the computer and its relevance as a mediational tool in the process of collaborative activity. *ReCALL*, *18*(02), 230-251. DOI: 10.1017/S0958344006000620, p. 235.

16 Gutiurrez, G. A. (2006). Sociocultural theory and its application to CALL: A study of the computer and its relevance as a mediational tool in the process of collaborative activity. *ReCALL*, *18*(02), 230-251. DOI: 10.1017/S0958344006000620. p.245.

17 Hampel, R., & Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. *Language Learning & Technology*, *8*(1), 66-82. Retrieved from: http://oro.open.ac.uk/id/eprint/18378

18 Hampel, R., & Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. *Language Learning & Technology*, *8*(1), 66-82. Retrieved from: http://oro.open.ac.uk/id/eprint/18378, p.67.

taken to ensure a rich environment for interaction. All activities required students to meet online so as "to exchange ideas and negotiate solutions" [19]. Students were also able to create their own "rooms" where they met both inside and outside tutorial hours, collaborated and assumed responsibility for their learning. There was additional student communication through another tool called Firstclass, a place parallel to Lyceum where they also discussed issues regarding their work. Students were exposed to authentic situations and material that were closely connected to their interests and co-constructed knowledge they would be able to apply in future situations, such as their work environments.

3.2. Interaction hypothesis in CALL

In her study Cotos analyzed the learning possibilities of automated writing feedback (AWF) made possible with the Intelligent Academic Discourse Evaluator (IADE) [20].Participants were international university graduate students enrolled in a writing course. IADE is a web-based automated writing evaluation program that was implemented as a tool for revision, as students submitted their drafts and received immediate, metalinguistic, individual feedback. The specific tool, as well as task design used have drawn on the interactionist theoretical basis. Learners' output was modified and returned to them in the form of input, thus triggering computer learner interaction which enabled negotiation of meaning. Qualitative data and think aloud protocols were employed to support the claim that negative feedback and focusing on discourse form enhances language learning. Intrapersonal interaction was enhanced when focalizing in form and enabled learners "to construct a better understanding of discourse phenomena and eventually produce better quality output"[21]. Learners became more engaged and resubmitted a new, modified output by making corrective changes. Enhancement of the students' rhetorical ability was supported by participants' scores on pre and post-tests.

Kφtter analyzed data from text-based real-time collaborations via a MOO[22]. The aim of the study was to investigate whether tandem learning and a text-based virtual reality potentially optimizes interaction in a synchronous platform compared to emailing messages. University students in Germany and North America collaborated in completing projects of their own choice and data was collected through electronic transcripts of students' interactions. Participants exchanging

19 Hampel, R., & Hauck, M. (2004). Towards an effective use of audio conferencing in distance language courses. *Language Learning & Technology*, *8*(1), 66-82. Retrieved from: http://oro.open.ac.uk/id/eprint/18378 , p.71.
20 Cotos, E. (2011). Potential of Automated Writing Evaluation Feedback. *Calico Journal, 28*(2), 420-459. Retrieved from https://calico.org/html/article_872.pdf
21 Cotos, E. (2011). Potential of Automated Writing Evaluation Feedback. *Calico Journal, 28*(2), 420-459. Retrieved from https://calico.org/html/article_872.pdf , p.444
22 Kφtter, M. (2003). Negotiation of meaning and code-switching in online tandems. L*anguage Learning & Technology, 7*(2)*,* 145-172. Retrieved from: http://llt.msu.edu/vol7num2/kotter/

information received immediate feedback and they were forced to recall the means and strategies they had in order to engage in an effective online conversation such as clarification requests, repetition of utterances, recasts and asking for or providing paraphrase with the aim to modify their utterances. We might infer that the choice of media, even though designed as being complimentary to collaboration projects, was aligned with the interactionist approach that advocates for modified output and input. Even though there was no confirmation whether an online interaction promotes L2 competence, it has been observed to promote noticing of inefficiencies in their language performance, reconsiderations and revisions of the output. The interplay between L1 and L2 was negotiated among groups of students to ensure that it did not prohibit a sufficient amount of L2 authentic input, thus excluding a potential grammatical and lexical intake in the L2.

De la Fuente's research investigated the effects of computer mediated interactions and face to face interactions with regard to acquisition of L2 word meanings[23]. Participants were university students, learners of Spanish, separated into two groups, an Oral interaction group and a net-worked Virtual Chat group. Students that engaged in oral interaction were paired and pairs consisted of an information receiver and an information provider. Students that belonged to the second group were also paired but their interaction was computer mediated and synchronous text-based. The Interaction theory claims that negotiation is embedded in interactional exchanges, where there is a failure in communication. The present study has provided evidence that during the process of negotiation of meaning learners notice unknown vocabulary in their input, compare their performance, become aware of its inefficiency, receive negative feedback, they self- correct and are thus forced to produce the interactionally processed "target lexical output"[24]. Tasks were clearly defined with a view to support inter-language development and prohibit a superficial, aimless dialogue. Pre-tests and post-tests were carried out to assess the efficacy of both procedures. Results indicated that both face-to-face and CM text-based interaction enhance written receptive and productive skills, whereas CM interaction has been found to be least efficacious with regard to oral productive skills. In line with interactionist perspectives CM interaction tasks where negotiation of meaning takes place have favored advance in lexical development.

3.3. Situated learning theory in CALL

Chen & Lin have attempted to examine the implementation of a digital game-

23 De la Fuente, M. J. (2003). Is SLA interactionist theory relevant to CALL? A study on the effects of computer-mediated interaction in L2 vocabulary acquisition. *Computer Assisted Language Learning, 16* (1), 47-81. DOI**:** 10.1076/call.16.1.47.15526

24 De la Fuente, M. J. (2003). Is SLA interactionist theory relevant to CALL? A study on the effects of computer-mediated interaction in L2 vocabulary acquisition. *Computer Assisted Language Learning, 16* (1), 47-81. DOI**:** 10.1076/call.16.1.47.15526, p.49.

based learning system called Gourd Tang Dynasty in order to provide a virtual context that simulated the writing of Chinese poems and enabled junior high school students in Taiwan to achieve greater understanding of Chinese poetry[25]. Situated scenarios and story plots provided opportunities for conversations between characters and animations.. Based on situated learning principles knowledge is shaped and constrained by the amount of social interactions we engage in and the relationships we make with other people and content in actual situations. The Gourd Tang Dynasty system fostered students' immersion in the concepts of poetry and enabled them "to resolve their confusions in learning"[26]. Additionally, it has provided opportunities for reflection and feedback which, in their turn, facilitate problem resolution and motivation. An experimental group and a control group that experienced traditional oral instruction provided data that were in line with the hypothesis that game-based instruction in simulated situations has a significant impact on learners' achievement. Finally, learners' perceived ease of use and usefulness were examined as key determinants of their degree of acceptance and intention of behavior and high relativity among them reflected the system's success.

Yang investigated the efficacy of a system supporting an online situated learning environment called "Learning through Drama" [27]. University students studying English as a foreign language in Taiwan took part in synchronous and asynchronous interactions based on shorts clips of drama. On-site instruction supported the online system. According to situated learning theorists, learning is the product of the individual's engagement in authentic situations and contexts where collaborative problem-solving takes place. For learning to be meaningful, the material has to simulate real life situations. A drama series that is particularly connected to the mentality and the ethics of the learners' society and culture encourages active participation and activates pre-existing knowledge and schemata, so as to relate to students' experience, memories and background. Functionalities of the online system such as the E-meeting, Assessment and Vote Opinion motivated learners in three different levels, namely, the cognitive, the behavioral and the emotional. While working across genres, drama stimulated active participation prompted conversation and interaction with the teacher and finally it aimed at "engagement with authentic communicative events that help students experience the L2 in various situations within the context of culture"[28].

25 Chen, H.-R., & Lin, Y.-S. (2015).An examination of digital game-based situated learning applied to Chinese language poetry education. *Technology, Pedagogy and Education*, (ahead-of-print), 1-16. DOI: 10.1080/1475939X.2015.1007077

26 Chen, H.-R., & Lin, Y.-S. (2015).An examination of digital game-based situated learning applied to Chinese language poetry education. *Technology, Pedagogy and Education*, (ahead-of-print), 1-16. DOI: 10.1080/14759 39X.2015.1007077, p.6.

27 Yang, Y.-F. (2011). Engaging students in an online situated language learning environment. *Computer Assisted Language Learning*, *24*(2), 181-19. doi: 10.1080/09588221.2010.538700

28 Yang, Y.-F. (2011). Engaging students in an online situated language learning environment. *Computer*

Data included students' recordings of E-learning participation and evaluation of students' collaboratively construed knowledge after synchronous on site communication. Moreover, computer mediated communication significantly enhanced situated language learning as a) it brought together a wide range of authentic media b) it fostered collaboration by enabling students and teacher to meet both asynchronously and synchronously c) it made simulation or real life situations possible.

In her study Mills attempted to investigate the context of social networking environments and their relationship to knowledge acquisition through active participation[29]. French foreign language students were invited to create fictitious Facebook profiles, yet culturally defined. Applying the principles of situated learning theory, the researcher focuses on three dimensions that define communities of practice: a) Joint enterprise, that is, shared goals among the community. b) Mutual engagement, which is a prerequisite for membership and strengthens relationships among people. c) A shared repertoire, in our case, French sights and shared cultural artifacts. The global simulation project places student-created characters in a fictional-physical context and provides opportunities for interaction in a virtual community of practice in the center of Paris. Situated learning theory postulates that learning is achieved and mediated through social relationships cultivated in speech communities, communities of practice. Language socialization is considered a fundamental aspect for the emergence of social and pragmatic competences. The notions of knowledge, identity and social membership are interrelated and interconnected. Social Networking tools, such as this Facebook setting, enhance motivation, ensure engagement, "allow students to make connections to course content", and "develop learning relationships"[30].

4. MALL ... one step forward

MALL has gained considerable prominence over the last years because of its unique attributes to provide self-paced, ubiquitous language learning, as it can "help language learners have more authentic real world learning experiences, situating learning within their cultural and linguistic schemata "[31]. Although financial and technical impediments are gradually being or will be resolved in the near future,

Assisted Language Learning, *24*(2), 181-19. doi: 10.1080/09588221.2010.538700, , p.184

29 Mills, N. (2013). Situated learning through social networking communities: The development of joint enterprise, mutual engagement, and a shared repertoire. *Calico Journal, 28*(2), 345-368. Retrieved from: http://works.bepress.com/nicole_mills/33

30 Mills, N. (2013). Situated learning through social networking communities: The development of joint enterprise, mutual engagement, and a shared repertoire. *Calico Journal, 28*(2), 345-368. Retrieved from: http://works.bepress.com/nicole_mills/33, p. 349

31 Joseph, S. R., & Uther, M. (2009). Mobile devices for language learning: Multimedia approaches. *Research and Practice in Technology Enhanced Learning*, *4*(01), 7-32, p.28.

it is questionable whether MALL has fully taken advantage of its affordances and its potentials. Meeting this challenge is an issue of pedagogical orientation rather than technical or infrastructure constrains. A variety of learning theories have correspondent implications for MALL implementation, throughout all stages of the learning process. Theories should provide answers regarding the way learners can optimize learning, and the role of a mobile device in it. The following studies that attempt to answer these critical questions draw on the theories of sociocultural learning, interaction hypothesis and situated learning respectively.

4.1 Sociocultural Theory in MALL

In their study Liu & Chen have analyzed the effect of employing photos via mobile phones on language learning and more specifically on phrase learning[32]. The experiment took place in Taiwan and students enrolled in English as a second language classes were divided into two groups for the purposes of the study. Language learning strategies were explored through the lenses of total physical response theory and socio cultural theory. First students created mental linkages, that is, connected a new word to already stored-in-mind concepts and structures. Association of that kind enables retention. Then they used physical movement to retain items in the target language. Last, they applied images so as to connect phrases with visual symbols. A three-stage task was designed based on the three stage process for language learning: a) Association of the phrase with pre-existing patterns b) Recalling the phrase during a task which fosters longer retention in the individual's memory c) Creative production. The experiment group differentiated from the control group as far as the second stage is concerned, where they had to complete a photo taking task of physically constructing sentences using mobile devices. Both groups engaged in collaborative dialogue where jointly discussed and clarified semantic constructions of the phrases. Drawing on the sociocultural perspective, collaborative dialogue mediated language learning. Results indicated that the integration of the mobile device that enabled the photo taking activity had a significant impact on the learners' linguistic performance which is interpreted by the physical response approach that postulates concurrent, multi-dimensional processing of information.

4.2 Interaction hypothesis in CALL

The study conducted by Nah, White, & Sussex focuses on learners' adoption attitudes towards using mobile phones to access Wireless Application protocol

32 Liu, P.-L., & Chen, C.-J. (2015). Learning English through actions: a study of mobile-assisted language learning. *Interactive Learning Environments*, *23* (2), 158-171. doi: 10.1080/10494820.2014.959976

sites (WAP) for language learning material[33]. It investigates the possibility and efficacy of the WAP site in providing opportunities to have comprehensible input, negotiation of meaning, and comprehensible output, by using CALL software, emails, online discussion boards, and online conferencing tools. Discussion boards, exclusively accessible via mobile phones, SMS, mobile email, and mobile messengers entailed information exchange, sharing of ideas and negotiation of common answers. Students posted messages and traced responses to get support from peers and the instructor and at the same time they were able to send their assignments, that is, provide the output through their mobile devices, at their convenience. Students beliefs indicated that such interaction potentially also optimized collaborative, student-centered learning as students set the pace and time of their learning. Information was available on site and students received support and information on time via personalized learning environments[34]. Feedback from learners suggested that the WAP site significantly fostered collaborative learning, as throughout the three stages students supported each other, by sharing thoughts and exchanging ideas, thus co-constructing knowledge through communication and social interaction as a result of shared experiences. SLA theories have been used to provide a thorough explanation and directed to the target question to be asked. Successful implementation is embedded in the learners' degree of acceptance as it rated among the most important criteria, fostering motivation and consequently language competence.

4.3 Situated learning theory in MALL

Hwang & Chen pilot the application of a system enhancing listening and speaking skills via personal digital assistants (PDAs) [35]. Elementary school students in Taiwan who were separated into a control and an experimental group engaged in the practice of food-related vocabulary items on paper and through their PDAs respectively. Students recorded their own voice and listened to their peers' recordings in a familiar context i.e. at the school canteen. Then they were urged to form sentences using the target vocabulary in order to participate in conversations. Through the lenses of the situated learning theory students were able to participate and interact in context, thus making connections to the actual world acting spontaneously. Riddles, fan tan activities, that resemble brainstorming and peer discussions enabled students to practice speaking and

33 Nah, K. C., White, P., & Sussex, R. (2008). The potential of using a mobile phone to access the Internet for learning EFL listening skills within a Korean context. *ReCALL*, *20*(03), 331-347. doi:10.1017/S0958344008000633

34 Liu, P.-L., & Chen, C.-J. (2015). Learning English through actions: a study of mobile-assisted language learning. *Interactive Learning Environments*, *23* (2), 158-171. doi: 10.1080/10494820.2014.959976

35 Hwang, W.-Y., & Chen, H. S. L. (2013) Users' familiar situational contexts facilitate the practice of EFL in elementary schools with mobile devices. *Computer Assisted Language Learning*, *26*(2), 101-125. DOI: 10.1080/09588221.2011.639783

listening skills. Results demonstrated that the experiment group had significant gains compared to the control group while they also expanded their learning in their home. The latter indicates the degree of interest, satisfaction and motivation on the part of the learners. Finally, a principled basis has been provided for the choice of medium as well as task design.

Comas-Quinn, Mardomingo, and Valentine proposed and utilized the idea of creating a mobile webpage and blog which was used as a receptacle for students' contribution[36]. The project involved Spanish Diploma-level university students who used mobile phones, digital cameras and MP3 recorders to report and upload cultural manifestations of the target language in their original places. Initially, the students were asked to interact with the environment, that is, the informal setting of a town and be stimulated by it, connect it to their interests and experience and eventually choose those elements that intrigue them. Students were urged to make choices that would prompt, among others, responses not only regarding the cognitive part but of emotional nature as well. During the second stage students could engage "in a dialogue about the content of this online resource, can take part in the process of interpretation and construction of knowledge required to make sense of the foreign culture"[37].Task design was decided taking into consideration a variety of objectives to be met. Contrary to tutor-centered traditional contexts, students constructed meaning "based on student-generated content"[38]. Due to the fact that language and culture are closely connected and interdependent the project promoted students' intercultural insight. The choice of a blog was made because of the sustainability of its content over time and because it can be revisited to allow re-evaluation. Appealing learning material, learners assuming responsibility for their learning and task- based or even informal, accidental learning sit well in a situated learning approach which advocates that successful language learning is access to information, collaboration and applying it in real situations.

5. Conclusion

It is evident that in all of the surveys presented above, a theory and in some cases a combination of them have set the framework that has guided task design or research. However, instructors implementing CALL and MALL should keep in mind that all theories should be considered through the lenses of teachers'

36 Comas-Quinn, A., Mardomingo, R., & Valentine, C. (2009). Mobile blogs in language learning: making the most of informal and situated learning opportunities. *ReCALL*, *21*(1), 96-112. DOI: 10.1017/S0958344009000032

37 Comas-Quinn, A., Mardomingo, R., & Valentine, C. (2009). Mobile blogs in language learning: making the most of informal and situated learning opportunities. *ReCALL*, *21*(1), 96-112. DOI: 10.1017/S0958344009000032, p.103.

38 Comas-Quinn, A., Mardomingo, R., & Valentine, C. (2009). Mobile blogs in language learning: making the most of informal and situated learning opportunities. *ReCALL*, *21*(1), 96-112. DOI: 10.1017/S0958344009000032, p.103.

personal experience and should sometimes be adapted or adjusted for a specific audience. On the one hand, it is teachers' inspiration and experience that mediate theories and the actual practice. On the other hand, it is learners' needs, learning styles and background that require different approaches or even "the optimal balance of approaches" and flexibility[39]. Both factors are equally important if the aim is to capitalize on the affordances of technology. As technology evolves, the ways in which humans interact with its applications will undoubtedly change. CALL and MALL practitioners are therefore to design and implement research with a firm eye on the developments in SLA while taking into account the human-computer ever-changing relationship.

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39 Joseph, S. R., & Uther, M. (2009). Mobile devices for language learning: Multimedia approaches. *Research and Practice in Technology Enhanced Learning*, *4*(01), 7-32, p. 28.

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Second - Language Acquisition (SLA) theories applied to CALL (Computer-Assisted Language Learning) and MALL (Mobile-Assisted Language Learning)

Abstract

The researchers want their work to be based on a theoretical approach, they use to support their conclusion. CALL and MALL practitioners (designers and researchers) turn to current theories to either provide a basis for their design or to use them as a guide in the whole procedure of their research (data collection and analysis). First, this paper is probing into three of the most frequently used Second - language acquisition (SLA) theories, the Interaction Account theory, Constructivism and Social Constructivism, describing in short their main attributes. Then, the main part of this paper investigates the way in which these SLA theories are applied in twelve research papers about CALL and MALL. There are similarities and variations according to the practitioners' needs and backgrounds. Thus, there is a range of different interpretations and uses of theoretical models and frameworks.

Key words: Second - language acquisition, Computer-assisted language learning, Mobile-assisted language learning, Constructivism, Interaction Account theory, Social Constructivism

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Οι Θεωρίες Κατάκτησης της Δεύτερης Γλώσσας (SLA), όπως εφαρμόζονται στην Εκμάθηση Γλωσσών με τη Βοήθεια Υπολογιστή (CALL) και στην Εκμάθηση Γλωσσών με τη Βοήθεια Κινητού (MALL)

Περίληψη

Οι ερευνητές θέλοντας το έργο τους να είναι βασισμένο στη θεωρία, αξιοποιούν το θεωρητικό πλαίσιο για να στηρίξουν τις αποφάσεις τους. Επαγγελματίες (σχεδιαστές και ερευνητές) στην Εκμάθηση Γλωσσών με τη Βοήθεια Υπολογιστή (CALL) και στην Εκμάθηση Γλωσσών με τη Βοήθεια Κινητού (MALL) προσανατολίζονται σε τρέχουσες θεωρίες είτε για να αποτελέσουν τη βάση για το σχέδιό τους είτε για να τις χρησιμοποιήσουν ως οδηγό στην όλη διαδικασία της έρευνάς τους (συλλογή και ανάλυση δεδομένων). Το συγκεκριμένο άρθρο ανιχνεύει τις τρεις από τις πιο συχνά χρησιμοποιούμενες θεωρίες Κατάκτησης της Δεύτερης Γλώσσας (SLA), τη θεωρία της Αλληλεπίδρασης, του Κονστρουκτιβισμού και του Κοινωνικού Κονστρουκτιβισμού, περιγράφοντας με λίγα λόγια κύρια τα χαρακτηριστικά τους. Στη συνέχεια, το κύριο μέρος του άρθρου διερευνά τον τρόπο με τον οποίο αυτές οι θεωρίες εφαρμόζονται σε δώδεκα ερευνητικές εργασίες που αναφέρονται στο CALL και το MALL. Υπάρχουν ομοιότητες και διαφορές ανάλογα με τις ανάγκες και το υπόβαθρο των ειδικών. Έτσι, υπάρχει μια σειρά από διαφορετικές ερμηνείες και χρήσεις των θεωρητικών μοντέλων και πλαισίων.

1. Introduction - SLA Theories

In the last decades there has been a shift from the traditional face-to-face teacher-centered setting to a more learner-centered one, where the interaction between learners is considered more effective than teacher-led interaction[1]. According to the **Interaction Account** theory, interaction is the most important source of data for language learning. The researcher M. Long takes a step beyond Krashen's Input Hypothesis, claiming that we should focus on the interaction where the learners are engaged, if we want to understand better the nature and usefulness of input in SLA[2]. He supports that interactive tasks that promote negotiation of meaning can facilitate the language learning process. In cases of communication breakdowns, negative evidence promotes modified output which allows the learner to focus on the form and not only on the meaning[3].

With the initiation of psychology and an extensive study of cognitive development G. Piaget and L. Vygotsky provided the foundation to a new approach

1 Marisol, F.G. & Asuncion, M.A. (2002). Negotiation of meaning in nonnative speaker-nonnative speaker synchronous discussions. *CALICO Journal*, Vol 19, No 2, p.p. 279-294.
2 Mitchell, R.& Myles, F. (1998). *Second language learning theories*. London: Arnold.
3 De la Fuente M. J.(2003). Is SLA interactionist theory relevant to CALL? A study on the effects of Computer – Mediated Interaction in L2 language acquisition. *Computer Assisted Llanguage Learning,* Vol 16, No 1, p.p. 47-81.

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to learning, the psychological theory of **Constructivism**. For cognitive scientists, emphasis is placed on the mental processes (such as learning remembering or problem solving) as well as on modern technology, while studying how people learn. For the constructivists, learning is the result of mental construction. The learning process takes place when the individual builds new information onto his pre-existed knowledge, understanding and skills[4]. Active construction is the key word to learning since learners are not any more passive recipients of information. So we shift from "knowledge –acquisition" to "knowledge-construction". "Knowledge is not imposed from outside people but rather formed inside them[5].

Piaget talked about age-related developmental stages, that is, fixed age stages where a child performs specific intellectual development. Vygotsky went a step further and talked about **Social Constructivism**, that is, "he emphasized the critical importance of interaction with people (other children, parents, or teachers) in cognitive and social development"[6]. For Vygotsky learning is seen as a socially mediated activity while the teacher is more of a facilitator who provides challenges for achieving more in learning. Terms like scaffolding and zone of proximal development (ZPD) are initiated by Vygotsky to describe a process of learning aided by the intervention of others. Teachers, peers and other individuals offer support at the appropriate time and at a higher level of understanding to help the learner move a step forward to another area of understanding. Collaboration in (ZPZ) rather than age is related to development which in itself is seen as an internalization of social experience.

Thus, there is a wide variety of theories that can provide support for an optimal CALL and MALL environment. The overabundance of theories related to language learning, their attributes and the extent to which they can be applied in CALL and MALL are some of the problems that the practitioners must take into account. What is more, they have to consider the constraints and affordances of the technological resources they have at their disposal. The brief investigation of the researches that follows illustrates the way in which theory is viewed with regard to practice in language teaching.

2. Interaction Account theory

2.1. 1st Article: *Designing task-based call to promote interaction: en busca de esmeraldas* (Marta Gonzαlez-Lloret)[7]

In this article, Long's principles of language teaching and Doughty's adaptation

4 Pritchard, A. (2009). *Ways of Learning Learning Theories and Learning Styles in the Classroom.* Abingdon, Oxon: Routledge.
5 Schunk, D. H. (2012). *Learning Theories An Educational Perspective.* Boston, MA: Pearson, p.274.
6 Hung, D. (2001). Theories of Learning and Computer-Mediated Instructional Technologies. *Educational Media International*, Vol 38, No 4, p. 282.
7 Gonzαlez-Lloret, M. (2003). Designing Task-Based CALL to promote Interaction: Enbusca de esmeraldas. *Language Learning & Technology*, Vol 7, No 1, p.p. 86-104.

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that divides these principles into four categories: activities, input, learning processes, and learners, are used as guidelines in order to select design features of the CALL activity (i.e. "En Busca de Esmeraldas") with the main aim to foster communication and negotiation.

The overall activity is designed with focus on the concept of "learning by doing" since students take on the main role in a developing story in the simulated target language environment, practicing at the same time some specific computer skills. The Task-Based Language Teaching (TBLT) and its four main steps as described by Long are developed, since it best fits the principle of "learning by doing." Focus is also placed on the principles about the input which has to be rich and elaborated rather than simplified or unnatural. To achieve this, modified input is provided to the students (e.g. antonyms synonyms paraphrases etc) when the cursor is placed on any unknown item. The activity also incorporates those "chunks," or common phrases, necessary for giving and following directions according to Doughty and Long's suggestion that the incorporation of whole "chunks" of the input may be beneficial for learners when performing a task. Besides, while students were working with "En Busca de Esmeraldas," teachers provided help with common and individual linguistic problems, implementing Longs' principle of Focus on Form (FonF). The role of the feedback is also essential, provided either by another student during the negotiation of meaning or by the teacher as a response to students' written output, submitted by e-mail. The learners' needs analysis and psycholinguistic readiness were also taken into account through practice of giving and following directions in a realistic environment (in the simulation activities). In "En Busca de Esmeraldas" peer-interaction is emphasized, since the learners work mainly collaboratively on tasks. Finally, Doughty and Long's idea of "individualization" is implemented through several tasks accomplished with the use of different media (audio and visual) in an effort to accommodate different learning strategies, interests, and cognitive styles.

2.2. 2nd Article: *Negotiation of meaning in nonnative speaker-nonnative speaker synchronous discussions* (Marisol Fernαndez-Garcνa &Asuncισn Martνnez-Arbelaiz)[8]

The theoretical framework the authors are based upon refers to the discourse moves that allow the interlocutors to ensure the message comprehensibility. Reference is made to the interactional modifications (emerging from problems in conversation) which can lead to the comprehensibility of the input, facilitating thus the language learning process. F.G and M.A used the theoretical model proposed by Varonis and Gass according to which, when breakdown in conversation occurs, speakers

8 Marisol, F.G. & Asuncισn, M.A. (2002). Negotiation of meaning in nonnative speaker-nonnative speaker synchronous discussions. *CALICO Journal*, Vol 19, No 2, p.p. 279-294.

engage in negotiation routines, consisting of two parts; a trigger and a resolution. They used this model as a tool to describe the negotiation of meanings in routines in online chat, with synchronous electronic medium, trying to explore whether this environment provides ample opportunities for such meaning negotiation. Focus is placed on the negotiation of meaning, because this type of interaction allows optimal conditions for language acquisition, since it facilitates the production of comprehensible input and modified output. Besides, the discourse via computer-assisted interaction is emphasized, since the synchronous written interaction is viewed positively by the interactionists. Reference is also made to the importance not only of the amount of participation/production, but also of the specific structures produced through the interaction. The outcome of the study illustrate that the electronic medium does allows many opportunities for negotiation of meaning but mainly of lexical items. What is more it provides a forum where the learners participate in the negotiation of meaning at their own pace. Thus the authors use the theory in order to justify the particular approach used, as well as evaluate the learners' overall performance.

2.3. 3rd Article: *Is SLA interactionist theory relevant to call? A study on the effects of computer –mediated interaction in l2 language acquisition* (Maria J. de la Fuente)[9]

The author makes extensive reference to the theory of Interaction Account and how this theory is applied effectively in CALL environment as described in various relevant literatures. The research studies the role of negotiation and modified output in L2 vocabulary acquisition. Relevant researches have proved that negotiation of meaning can be equally effective in both face to face and online interactions however he supports that well designed interactive tasks of synchronous CNC become an optimal medium to make students advance in their lexical interlanguage. The vocabulary development can be the outcome of an online negotiation task were "noticed" lexical input is provided and then pushed lexical output is produced .The vocabulary-focused, interactive, online learning tasks of both L2 performance and L2 vocabulary acquisition of the learners of Spanish that are described in this study are structured according to the aforementioned theory. Two groups of students, performed oral interaction(the first) and networked virtual chat(the second), in the process of negotiation of meaning, where they had to "notice" unknown vocabulary in the input, compare their performance, realize any inefficiency, receive negative feedback and produce target lexical output. The author discovered that both cases of interaction are

9 De la Fuente M. J. (2003). Is SLA interactionist theory relevant to CALL? A study on the effects of Computer – Mediated Interaction in L2 language acquisition. *Computer Assisted Language Learning,* Vol 16, No 1, p.p. 47-81.

equally effective in promoting L2 vocabulary, though CM negotiated interaction seems to be less effective in promoting oral acquisition of L2 words. Thus, the author uses theory to support the use of the specific method in her study and to justify the design of the specific task (the selection of electronic media used, the goals, the procedure followed), as well as evaluate the effectiveness of the CALL negotiated interaction in L2 vocabulary acquisition.

2.4. 4hArticle: *The potential of using a mobile phone to access the internet for learning EFL listening skills within a Korean context* (Ki Chune Nah, Peter White &Roland Sussex)[10]

This research paper examines the potential of using a mobile phone to browse wireless application protocol (WAP) sites for the purpose of learning listening skills based on various theories, such as the interaction theory and the sociocultural theories.

In the experiment that was carried out, the overall task design, the goals, the selection of the MALL materials (the WAP site, the MDB, the tasks) and the whole procedure were all theory driven, after the affordances and the constraints of the mobile device were taken into account. Thus, comprehensible input, negotiation of meaning, and comprehensible output could be achieved effectively through the MALL activities on the WAP site. The lack of time and space constraints of the mobile phones could provide language learners with comprehensible input through Mobile Discussion Board (MDB) anytime anywhere and through dialogue with their teacher or peers. Opportunities for negotiation of meaning was also offered, by allowing language learners to interact with their peers and teacher, and obtain help and feedback related to the tasks from the MDB, at times and places of their choosing outside the normal classroom. Finally, the learners were encouraged to produce comprehensible output by writing or selecting, based on what they have learned.

As for the survey that was conducted, the questions, as well as the interpretation of the data were also theory driven. That is, one of the questions was "What are the Korean EFL students' perceptions of the effectiveness of the WAP site for collaborative learning?" while the results showed that the assignment tasks did involve interaction and negotiation of meaning with other participants. In the stage of the analysis of the results, theory helped to determine factors which positively influence learning, such as frequent comprehensible input, negotiation of meaning and comprehensible output, and enhanced student-centered and collaborative learning. The findings in general, reflected and supported the theoretical framework that was presented at the outset of the research.

10 Ki Chune, N.,White, P.,& Sussex, R. (2008). The potential of using a mobile phone to access the Internet for learning EFL listening skills within a Korean context. *ReCALL*, Vol 20, No 3, p.p. 331-347.

3. Social Constructivism

3.1. 1st Article: *Collaborative interactionas the process of task completion in task-based call classrooms* (Nobue Tanaka)[11]

This study aims at analyzing the collaborative interaction among learners of Japanese who interpreted and completed open-ended tasks in two task-based CALL classes at a secondary school in Australia. The sociocultural approaches of mediation and the zone of proximal development were used as the main tools for analyzing this collaborative interaction. The author also attempts to critically examine the suitability of sociocultural theory as the analytical tool. So, the main aims of this study are theory-driven.

In his rationale, the author justifies the combination of the sociocultural approaches and the task-based pedagogy, since the former is employed to understand student activity during the process of task completion and the latter is used to induce collaboration among students making scaffoldings attainable. The selection of the specific tasks, identified as either *turn-taking* or *cooperative production* is also theory-based, since the participants form social relations developed by their collaborative work and possess individual knowledge which will be shared by other members for constructing new knowledge as the result of social relations.

While discussing the data of the research, the sociocultural approaches of mediation and the zone of proximal development were proved to be useful for analyzing interaction and its outcome, the role of each participant in interaction, and how and what learners are trying to learn through interaction. Thus, theory provided the research method and tools and determined the significant factors in learning.

3.2. 2nd Article: *Multiplying modalities: openingup the fourth dimension to the online learner* (Uschi Felix)[12]

The study provides practical examples of online communities, in which participants move between real and imaginary worlds, trying to explore how audio-based applications in the form of voiced bulletin boards (Wimba), voiced chats (Traveler) and audio graphics (Lyceum) can assist in creating meaningful social constructivist activities in online language education.

Agreeing that the oral skills are the least accomplished of the four since they carry a high level of ego involvement, the purpose of this paper is to discuss the potential of these three innovative resources for setting up social

11 Tanaka N. (2005). Collaborative interaction as the process of task completion in task-based call classrooms. *The JALT CALL Journal*, Vol 1, No 2,p.p. 21-40.
12 Felix U. (2005). Multiplying Modalities: Opening up the fourth dimension to the online learner. *The JALT CALL Journal*, Vol 1, No 3, p.p. 17-32.

constructivist activities and communities in attractive virtual settings and under user-friendly conditions. The author, examining these resources one by one, their affordances and their constraints, explains that they can all, with some alterations, provide excellent potential for creating sound social constructivist activities. Concluding, he suggests that teachers are offered ample opportunities to set up meaningful social constructivist (oral) activities and communities of enquiry in social constructivist settings, based on these three resources. That is, theory can guide technology selection in the classroom as well as the teachers' options in the task design procedure.

Thus, theory strengthens the main goal of the study, while it also explains the selection of the resources, the online course, the programs used, the tasks and the overall design.

3.3. 3rd Article: *Theoretical perspectives and new practices in audiographic conferencing for language learning* (Hampel Regine)[13]

This article is about the online tuition using an audio-graphic Internet-based conferencing system called Lyceum, used to develop students' communicative skills, at the Open University where languages are taught at a distance. One of the theories applied to the practice of audio-graphic computer-mediated communication (CMC) is the sociocultural theory supplemented by constructivism and the Interaction Account theory.

The author uses theory to describe the affordances and constraints of the media used at the Open University (CDs and videos) supporting that they might provide spoken language input and elicit oral output, but they do not cover the need for interaction and the negotiation of meaning in a communicative situation, which is essential for second language acquisition, nor does it provide for sociocultural learning with tutors and peers. Thus, she justifies the need for the use of Lyceum, which meets the requirements of the L2 acquisition, as defined by the aforementioned theories; it allows for synchronous voice communication over the Internet, offering a way to overcome the distance between students, and gives them the opportunity for negotiation of meaning, practicing their oral skills and communicating easily with their tutor and with other learners in the target language.

Besides, the use of technology is also pedagogically grounded, since these learning theories, which all revolve around social aspects of learning, are also applicable to CMC. Both pedagogical theories and previous studies of CMC are the basis for the design and implementation of online tuition at the Open

13 Hampel, R. (2003). Theoretical perspectives and new practices in audio-graphic conferencing for language learning. *ReCall*, Vol 15, No 1p.p. 21–36.

University. The tasks used are based on sociocultural theories of learning since they reflect principles of interactive, collaborative, student-centered learning based on sociocultural and constructivist theories. They students are encouraged to participate in role-plays or other pre-arranged activities requiring collaborative interaction. The tutor's role is more that of a facilitator than a traditional teacher, giving students more autonomy and more control of the situation.

3.4. 4th Article: *EFL learner use of podcasting resources: a pilot study* (Nicolas Gromik)[14]

This research investigates students' use of video MP3 technology (iPod) to develop EFL awareness. The use of iPod is placed within a sociocultural theoretical framework with the aim to examine whether technological devices can become useful tools to disseminate knowledge and consolidate acquisition. The co-occurrence of the iPod technology and the iTunes service in the particular task design is an exceptional choice to support this framework; both these resources expose the learners to new content and new lexical items (in the selected videos) and urge them to consolidate their prior knowledge of the target language, developing an interest in learning more about an issue. The use of the specific tools and materials motivates the learners, who then scaffold their language learning development. Theory is thus behind the whole procedure of the task, the media selection, the task design and its structure.

In the second part of the research, it describes a survey that was conducted in parallel with the course. However, the evidence we are given of the types of the questions (in both interviews and questionnaires) the data collection and the analysis, imply that the whole procedure is not theory driven. The main focus of the pilot-study is on students' abilities to use the technology, rather than on their linguistic progress (made through the use of iPods), which was of great interest in the task described in the beginning.

4. Constructivism

4.1. 1st Article: *Wikis and constructivism: exploring the links* (Nicholas Yates)[15]

The author uses the theoretical framework to supports the rationale and justification of his study. This action research paper observes student behavior while completing a wiki project about the cultures of Japan, which is designed according to the principles of constructivism. Since constructivism empowers students to build meaning together, the author hypothesizes that students' use of a

14 Gromik N. (2008). EFL learner use of podcasting resources: a pilot study.*The JALT CALL Journal*, Vol 4, No 2, p.p. 47–60.
15 Yates, N. (2008). Wikis and Constructivism: Exploring the links. *The JALT CALL Journal*, Vol 4, No 3, p.p. 15 – 28.

wiki could increase knowledge accommodation, interpretation, and organization as learners gradually socially construct their definition of culture in the wiki. The wikis require some degree of collaboration and meaning construction and through activities like, reflection and conversation, students actively construct meaning and knowledge.

The selection of the specific tool Web 2.0, the type and structure of the task, the whole procedure are also theory-based. So, the topics chosen by the students for their wikis were based on their interests, since by pursuing their own interests, they get even more empowered, according to the constructivist principles. Besides, students were constantly encouraged to collaborate with each other in the writing process, to hyperlink or contribute their opinion or knowledge to other's pages and to give feedback to each other. The use of wikis with a constructivist framework is a valuable tool for the teachers who can create an environment with more opportunities to avoid surface-level learning and promote deeper learning about content.

An interpersonal intra-wiki hyperlink analysis that was carried out, investigated the student behavior within their wiki when they used hyperlinks to connect and essentially construct knowledge by expanding and broadening their wiki on the cultures of Japan. This analysis showed that there wasn't extensive student collaboration or social construction of knowledge in the wiki, but they did shared researched information differently, e.g. by swapping their laptops. Thus, theory was also used for the evaluation of the task.

All in all, this project used its pedagogical rationale for combining the wiki and constructivism, as wikis foster constructivist ideals.

4.2. 2nd Article: *Learning environments that facilitate reflection on language learning* (Jo Mynard)[16]

This study describes a university course designed to facilitate awareness of the language learning process through the examination and adoption of various technology-based language learning tools (TLLTs). The design of the CALL course described in this article was based on constructivist learning theories which draw on the students' previous experiences. The selection of the social networking sites (SNS) as the main TLLT, the structure and the content of the tasks and activities that are used and the overall procedure followed are all theory-based.

The author uses social network enhanced blended learning environment, with ample opportunities for the students to interact with other people (members of the class and outsiders), as the ideal learning environment for reflection and knowledge co-construction, through a blend of face-to-face and online interaction.

16 Mynard, J. (2011). Learning environments that facilitate reflection on language learning. *The JALT CALL Journal*, Vol 7, No 3, p.p. 293-306.

In the second part of the course, the activities were learner-directed; the students decided on the focus and pace of the activities (according to their needs and their pre-existing knowledge),learned about strategies and resources from others and adapted the ideas for their own language learning needs.

On evaluating the procedure and the outcomes, there was evidence that learners looked back at what they had learned during the course and constructed and reconstructed their views about the use of certain tools, strategies and materials; learners were learning from each other and then used others' ideas for their own language learning purposes. We are given an indicative example, where a student constructed and reconstructed her views on using news websites for language learning. Thus, theory was also used for evaluation purposes.

4.3. 3rd Article: *Practical powerpoint group projects for the EFL classroom* (Matthew Apple&Keita Kikuchi)[17]

This paper describes three different methods for using PowerPoint in a university classroom setting, involving the construction of picture stories, making travel plans, giving guidelines for research projects, based on the constructivist principles of the scaffolded learning. The author uses the theory to strengthen his rationale explaining that through the process of teaching and scaffolding each other, learners manage to communicate verbally and monitor their language use.

He supports that in the EFL classroom, scaffolded learning can be achieved in cooperative group work which can increase the amount of mediated input but also encourage motivation, self-confidence, critical thinking, and autonomy. He justifies thus, the use of the particular approach and the selection of the CALL activities that are structured around cooperative group work tasks. The selection of the PPT software programming group projects is also explained in terms of the aforementioned theoretical framework; the PowerPoint group projects (PGP) resemble the scaffolding of the tasks in a language classroom (except that the students are using a computer), where the students are encouraged to notice their language use and to scaffold from each other, but in a more learner-centered, motivating way. The noticing and co-construction of knowledge is evolving and developing over the period of time, making thus the process of learning more important than the product.

Finally, theory is used to support the suggestions made by the author to the teachers, who can use databases of previous student projects to provide future students with even more scaffolding.

17 Apple, M.&Kikuchi, K. (2007). Practical PowerPoint group projects for the EFL classroom. *The JALT CALL Journal*, Vol 3, No 3,p.p. 110-122.

4.4. 4th Article: *Mobile learning: a framework and evaluation* (Luvai F. Motiwalla)[18]

This project examines the extension of e-learning into wireless/handheld (W/H) computing devices in mobile learning classroom environments, with the help of a mobile learning (m-learning) framework and develops a prototype application from the requirements generated from this framework. This application was evaluated with students from both online and on campus to explore m-learning feasibility in higher education. The author supports that learning on W/H devices will never replace classroom or other electronic learning approaches but it can complement and add value to the existing learning models like the constructive theory of learning with technology, providing thus the rationale and the theoretical basis for his study.

The mobile learning framework used, is based on pedagogical approaches to support the constructive learning in a mobile environment. So, it provides five approaches for using technology in learning, like

- the intelligent tutoring systems to replace the teacher,
- the simulation and modeling tools that serve as learner's assistants (or pedagogical agents acting as mentors providing feedback),
- dictionaries, concept maps and other resource aids that help learners to learn or organize knowledge with system tools and resources,
- personalized communication aids that can present materials depending on user pre-existing knowledge and experience with the system, where students can control or filter the content and
- simulated classrooms and labs that engage teachers and learners in an interaction similar to the real classrooms, where students can reflect and react to the input that they receive.

Thus, the constructive learning and conversation theories are incorporated in the framework used for designing the application.

Theory is also used to describe and justify the pedagogical shifts that impact the m-learning environment. The communication and interaction process between the learner and teacher is altered with the students being empowered, having the learning responsibility for their individual learning goals, schedules and assessments. Besides, new synchronous and asynchronous communication tools are initiated, to allow sharing of ideas, virtual collaboration and better opportunities for reflecting on previous interactions and constructing on pre-existing knowledge.

Finally, the results of the research indicated that constructive learning and conversation theories can be used and adapted for a mobile learning environment,

18 Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers & Education*, Vol 49, No 3, p.p. 581–596.

given that we realize the strengths and weakness of a particular technology. Suggestions to future m-learning educators are thus theory driven, directing them toward the use of learning pedagogies which can help the overall m-learning strategy, and the achievement of specific learning goals.

5. Conclusion

There are many theories available for the practitioners of CALL and MALL to draw upon in their work. Theory can not only motivate a research but it can also guide the design and the construction of CALL and MALL materials. The aforementioned examples illustrate the different ways that theory is utilized. In most cases, the CALL and MALL researchers usually restrict themselves to a single theoretical framework. On the other hand, the CALL and MALL designers use a number of theoretical perspectives simultaneously, in order to provide and support the use of the specific research method and tools, to justify the particular approach used and the design of the specific task (the selection of electronic media used, the goals, the procedure followed), to determine the significant factors in learning and finally to evaluate the learners' overall performance. Besides, the findings of some researches showed that theory helps to describe and justify the pedagogical shifts that impact the environment, to determine factors which positively influence learning, such as frequent comprehensible input, negotiation of meaning and comprehensible output, enhanced student-centred and collaborative learning while it can strengthen the main goal of the study and explain the selection of the resources, the online course, the programs used, the tasks and the overall design.

Whatever the case, theory is considered of primary importance by many CALL and MALL designers and researcher who view to it as the main goal in language learning and in CALL and MALL practices. However, it should not replace the teachers' knowledge and experience, which stem from reflection and practice, but it should rather complement them.

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Special Education of person with Autism in France

Abstract

The special education in France is defined by the legislation regarding on equal rights and opportunities, participation and citizenship of persons with disabilities. The principle of priority of schooling for disabled pupils in ordinary schools has been approved by law with the act no. 2005-102 of 11 February 2005. In this study we examine the integration of people with autism in the age range 3-30 years in France. The education code affirms the principles of special education emphasizing the intervention programs (TEACCH, ABA, MAPS) and the accompanying psychotherapies. It thus devotes a new approach: whatever the particular needs of the pupil, it is up to the school to ensure that the environment is adapted to its schooling by specifying the procedures for implementing the training courses for pupils with disabilities. The educational pathways for them, which are defined in the context of school integration into vocational training, require the co-ordinate intervention of several actors. From this study we have concluded that inclusion of people with autism in France supported by lifelong special education programs.

Keywords: Special education, Autism, France

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Ειδική αγωγή και εκπαίδευση ατόμων με αυτισμό στην Γαλλία

Περίληψη

Η ειδική αγωγή και εκπαίδευση στη Γαλλία ορίζεται από τη νομοθεσία σχετικά με την ισοτιμία των δικαιωμάτων, των ευκαιριών, της συμμετοχής και της ιθαγένειας των ατόμων με αναπηρία. Η αρχή της προτεραιότητας της σχολικής εκπαίδευσης των μαθητών με ειδικές ανάγκες στα κανονικά σχολεία έχει εγκριθεί από τον νόμο αριθ. 2005-102, της 11ης Φεβρουαρίου 2005. Στη μελέτη αυτή εξετάζουμε την ενσωμάτωση των ατόμων με αυτισμό στο ηλικιακό εύρος 3-30 ετών, στη Γαλλία. Ο εκπαιδευτικός κώδικας επιβεβαιώνει τις αρχές της ειδικής αγωγής με έμφαση τα προγράμματα παρέμβασης (TEACCH, ABA, Μοντεσσόρι) και τις συνοδευτικές ψυχοθεραπείες. Σύμφωνα με την νέα προσέγγιση για την ειδική αγωγή και εκπαίδευση, εναπόκειται στο σχολείο για να διασφαλιστεί ότι το περιβάλλον είναι προσαρμοσμένο στις ιδιαίτερες ανάγκες του μαθητή και στην εκπαίδευση του, καθορίζοντας τις διαδικασίες για την υλοποίηση των εκπαιδευτικών προγραμμάτων. Στο πλαίσιο των εκπαιδευτικών διαδρομών αναφορικά με την σχολική ένταξη και την ειδική επαγγελματική κατάρτιση απαιτείται η συντεταγμένη παρέμβαση πολλών παραγόντων. Από τη μελέτη αυτή έχουμε καταλήξει στο συμπέρασμα ότι η ένταξη των ατόμων με αυτισμό στη Γαλλία υποστηρίζεται δια βίου με προγράμματα ειδικής αγωγής και εκπαίδευσης.

Λέξεις-κλειδιά: Ειδική αγωγή, αυτισμός, Γαλλία

1. Introduction

The official bulletin of national education[1] ‘’des Elèves Handicaps’’ describes circulars with political decisions on school integration in France and publishes administrative acts and decrees, regarding the annual management tasks in the education of students with disabilities in both the primary and secondary education. The official bulletin defines the diversity and the increase in the number of pupils with disabilities and makes it necessary to specify the different possibilities and characteristics of pupils, as well as the legislative and regulatory changes in enrollment and vocational training. So, the “units for school inclusion (ULIS: Unités Localisées pour l’Inclusion Scolaire, circular no. 2010-088 of 18 June 2010) is replaced by «the schooling of pupils with disabilities in the first and second grades’’ (circular no. 2015-129 of 21 August 2015).

1 Bulletin officiel de l’ıducation nationale (B.O.E.N.) Scolarisation des élèves handicaps, La formation et l’insertion professionnelle des élèves en situation de handicap, NOR : MENE1634901C, circulaire n° 2016-186 du 30-11-2016, MENESR - DGESCO A1-3, In: http://www. education.gouv.fr (accessed on 15/12/2016)

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The educational pathways are defined in the context of the departmental houses of persons with disabilities (MDPH: les Maisons Départementales des Personnes Handicapées), the regions in charge of vocational training and the medical and social institutions and services involved in reception and support.

Also, pupils with disabilities are defined with subjects to common law for the integration and their schooling falling within the scope of circular no. 2016-117 of 8 August 2016 on "pupils with disabilities in schools: parcours de scolarisation des élèves en situation de handicap". This circular specifies the role of each of the actors in schooling and the articulation between the different mechanisms and comes in addition to organizing and accompanying training periods in a professional environment and the successful entering into vocational college. The preparation of the orientation of pupils with disabilities is defined as the project within the framework of the future and falls on the one hand to the decisions of the committee on the rights and autonomy of persons with disabilities (CDAPH: Commission des Droits et de l'Autonomie des Personnes Handicapées) and, on the other, to orientation and assignment procedures of academic services and the school integration. It is important to define that the life project expresses the needs and aspirations of the pupil who is in a situation of disability. It is a projection into the future of these students, the expression of their choices of life. This life project makes it possible to specify the expectations and the needs so that the response of the MDPH is more adapted to the individual situations and the expectations of the student in a handicapped situation in relation to the recommendations of the follow-up team of schooling integration. These are mentioned in the guide to assessing the needs of compensation for school enrollment and as a follow-up to the implementation of the Personalized Schooling Project (PSP).

2. Education of persons with disabilities

The education of persons with disabilities[2] is defined successful academic and professional path. This is determined by the fruit of an anticipated reflection allowing to project itself in the future and to make reasoned choices for the school and academic integration programs in France. More than for the other students, the success of the individual pedagogical of orientation programs gives rise to a specific preparation carried out very early, in the year-end procedures. The phases of orientation mobilize the student, his family and all the members of the school follow-up team. The progressive development of the educational and vocational guidance project is defined as one of the main objectives of the school integration programs in France. This educational path defined by the decree of

2 Δροσινού, Μ. (2003). Η εκπαίδευση των παιδιών με ειδικές εκπαιδευτικές ανάγκες στη Μασσαλία της Γαλλίας. *Ανοιχτό Σχολείο* (88), σσ. 21-27

1st July 2015 and published in the official bulletin of national education aims to acquire the knowledge and skills necessary to make informed and thoughtful choices. In addition to teaching activities carried out within the courses, the school integration course provides specific support times (personalized accompaniment, personalized orientation counseling) that help to take into account the particular needs of each student, particularly those with disabilities.

The education of persons with disabilities is defined as compulsory in Europe. This reality is quite different in countries such as Belgium, Sweden, United Kingdom, Italy or Spain, in which 97% of disabled are enrolled. The existence of early the screening, generalization of multidisciplinary approaches, the integrating of educational strategies and the existence of accommodation structures adapted to the age and profile of people with autism have made great strides in the understanding and treatment of autism. In all these countries, apart from a positive to otherness, the identification of autistic disorders from the earliest age from a European point of view.

In 2004, France was condemned by the European Council of social rights for the failure of the French in caring about autistic children and for that reason this will remain an important date in the history of French autism. The Council of Europe has timely recalled that the application of the charter of fundamental rights imposed the obligation for the signatory states "to take only legal initiatives but specific concrete initiatives to enable the full exercise of the rights recognized by the charter ".

This obligation reaffirmed by Europe, at the end of 2008, when France still ignored the Social Charter European Conference on Equal Access to people with autism, is still relevant even if they begin to move the last years. In general, the delay of France in the accompanying people with autism throughout their life violates humanist values the European Union. In France, the main argument in order to explain this delay highlights the indifference of the authorities. It is in part true, but in part only because no one can deny that in 2005 the High Authority of Health (HAS) issued recommendations for autism screening and thus has established itself for research as a a priority. Moreover, everything is done to facilitate the schooling of children with autism. In Italy, most autistic children are welcomed in ordinary classes[3]. As comparison, the figure is lower to 20% for France with a double restriction of compulsory attendance a school life support worker (AVS: Auxiliaire de Vie Scolaire) and of a lighter schedule. For its part, Sweden, after having banned the specialized agencies in 1995, in place of adapted classes within its schools. This mode of schooling also exists in the UK even if the choice left to the parents is wider. They can, in fact, choose between specialized schools, specialized classes or regular classes with specific support. In Spain, the

3 Δροσινού, Μ. (2015). Η σχολική ένταξη στην Ιταλία, *Θέματα Ειδικής Αγωγής,* (68), σ.σ.3-19

choice of parents of schooling varies according to the type of diagnosed autism. The alternative is classical schooling, as the case may be reinforced by personalized support, or enrollment in a specialized center for children with autism.

The report drawn up by the Valérie Létard (2012), at the Minister of Solidarity and Cohesion Socially is eloquent: "the persons, children and adults, with autistic syndromes and their relatives have long been victims, in France, of a diagnostic wandering leading to often delayed diagnosis; difficulties in accessing support early and adapted education, lack of places in adapted facilities the impossibility for families to choose the modalities of in the care of their child's care, the lack of support for families, and the inadequacy of accompaniment, care, and social integration of adults and elderly with this disability".

3. Autism and School Integration

Autism continues to attract a great deal of interest among both researchers and professionals[4] invited to respond to some practical challenges. According, to the Ghislain Magerotte, emeritus professor of the University of Mons, Belgium and professor Philippe Ivrard from the University of Paris-Diderot and Robert Debrı from the university hospital, chairman of the steering group of the good practice recommendation, the modalities of the support with educational and therapeutic interventions in children and adolescents with autism and other pervasive developmental disorders are a must. Also, they are focusing on two important dimensions: guidance of parents and individual psychotherapy of the child, who has good intellectual resources.

The school integration of people with autism has caused concern to the international French-speaking scientific community. The France -Autisme has a history of struggle in the last 20 years in an effort to help its members, approximately (9,000 families, 500.000 people with autism), is committed to continuously sensitizing general public about the failures of any kind of escort to autism, suggesting solutions. Established in 1989, after the observation that people with autism in France do not always have the right to a correct diagnosis and appropriate support throughout their lives and strives for educational support throughout the life of the person who has been diagnosed with autism coordinating educational interventions outside the psychiatric field. The organization for autism in France is a non-profit recognized association of parents and consists of more than 125 associations, members, partners and collaborators. France is in favor of early and timely diagnosis and is consistent with international classifications with respect to the recognition of skills and speech of their parents which can identify problems of the child. Providing information to parents and carers with specialist doctors, teaching staff for kindergarten, school, and for

4 Synodinou, C. (1985). Autisme infantile. Paris: Aubier.

those who help escort at home and at school. Autism for the ''Autisme –France'' is a neurological disability with possible genetic recital performance, and is not a mental illness. For this reason is required the state to harmonize the terms used in accordance with the classification of the World Health Organization (WHO). Autistic children are entitled to special education and training adapted to the very particular disadvantage with specific educational and pedagogical approaches that have been shown to aid the school integration and other countries are funded by governments, because they significantly reduce autism and allow socializing and later employability. This support is primarily a question of collective will, and can be organized individual's throughout life, if necessary, as with the systems that exist in anglo-saxon countries and northern Europe, where people with autism are all able to participate in learning processes and some of them can work. The organization for autism in France began as a cultural revolution - in order for people with autism to get out of the mental institution. Therefore, fighting for funding to educational and professional guidance in the broadest possible social integration with the conviction that the place for people with autism or other pervasive developmental disorders is not in the hospital but in the school.

4. Existing theories and correlation with the special education of person with Autism

In the global francophone[5] conference on autism (2016a) reported current trends in the epidemiology of autism by Eric Fombonne (2016b), psychiatry professor and director of the Research Institute for Autism[6], Development and Disability at the University of Oregon in Health and Science School. Epidemiological studies of autism have risen in the last 15 years. The results of a recent analysis of these studies give a conservative estimate of the prevalence of disorders of the Autism Spectrum Disorders (ASD), which is close to 1%, and ranges from 0.7% to 1.5% of the school age population. Furthermore, the results of specific studies in Korea, Mexico, Canada, England and France appear to be increasing in prevalence since 1960, because of the growing recognition of the special needs of government agencies. This reflects a better understanding to the autistic syndrome with stringent diagnostic assessments, to raise awareness and increase the public's better visibility on the age for early diagnosis.

4.1. Advisory Early Detection and Identification of Autism (0 - 18 Months).

Isabelle Bazin (2016), a psychologist at St-Etienne in France and a founding

5 Congres National d'Autisme France (2016a): "Chercher, inventer, innover : c'est possible". Sous le Haut Patronage de Mme Geneviève Fioraso, Secrétaire d'Etat chargée de l'Enseignement supérieur et de la Recherche, France In: http://www. autisme-france.fr (accessed on 05/01/2017)

6 Congres National d'Autisme France (2016b): Autisme : il est urgent de sortir de l'ignorance Faisons confiance aux professionnels bien forms, Paris, France In: http://www. autisme-france.fr (access on 05/01/2017)

member of twenty-nine diagnostic centers[7] for research and early diagnosis counseling mentioned in accompaniment, the diagnosis for the timely intervention of just 18 months. This service aims to reduce late diagnosis and the prolonged waiting for access -into specialized diagnostic services. The early intervention services are staffed with eight psychologists, and positions have been established in pediatric services with a focus on neurology to consolidate the network monitoring, diagnosis and interventions in children from 18 months. This work is centered on awareness, recognition and escorting, based on the recommendations of best practice and will promote the child's journey and his family so that effective early diagnosis in clinical practice can occur..

The focus of this initial meeting and consultation is to discuss the family's needs and to direct the family to both appropriate services as well as other available services in the community. The initial consultation is the first step to receive services and make a-reference. The parents complete the appropriate forms and communicate with their research institute of autism which it provides diagnostic evaluations for children, who are thought to have an ASD, but have not yet received a diagnosis. Evaluations typically last one to one and a half days at the clinic this (varies depending -on the complexity of the case and services provided) and focus on issues of diagnosis and educational programming and intervention.

The evaluation includes caregiver interview, review of medical, social, academic, and developmental history, caregiver questionnaires, and testing sessions with the individual. The individual is directly assessed using empirically-based assessment instruments including the Autism Diagnostic Observation Schedule (ADOS) and the Childhood Autism Rating Scale - 2nd edition (CARS2). Results of the evaluation are shared with the parents during an interpretive conference that is typically held at the end of the diagnostic day. An individualized, written evaluation summary with comprehensive recommendations and resources is given to the family.

The twenty-nine diagnostic centers for research and early diagnosis in France advice and support parents and educate them to meet and talk with other parents in a supportive setting. Workshops and teaching sessions focus on parent education and parent-professional collaboration. The focus of the education is on the characteristics of autism, and the impact it has on communication, social development, behavior management, and school services. Parents learn about their child's unique learning style and effective strategies that will enhance learning at home -and provide a range of intervention services for individuals with ASD. Individual teaching and counseling sessions focus on social skills,

7 The National Autism Center. (2011). *Autisme et pratiques fondιes sur les preuves. Guide à destination des parents. Informations et Ressources pour les familles d'enfants attaints de Troubles du Spectre Autisme.* France: Autisme-France.

organizational and study skills, and emotional regulation. Parents may work together with clinicians to create effective programs for their child at home, at school and in the community.

Early intervention involves working with families and school staff to increase a child's ability to function successfully and adaptively at home, in the community, and at school. The diagnostic centers for research and early diagnosis in France give individual teaching and counseling sessions which focus on relationships and the accompanying psychotherapies. The home teaching sessions are home-based services targeting children under 3 and their families and the sessions are time limited and the goals and activities of these are highly individualized to each child's developmental needs, and are developed and implemented collaboratively between the therapist and the family. The potential benefits of combining multiple interventions are into comprehensive, individualized and intensive early intervention programs for children with autism. The comprehensive refers to interventions address to a full range of life skills, from communication and sociability to self-care and readiness for school. The early intervention refers to programs designed to begin before age 4 and allow the children with autism to learn and practice skills in both structured and unstructured situations. The intensity of these programs may be particularly important to replicate the thousands of interactions that typical toddlers experience each day while interacting with their parents and peers. Some preschoolers who participate in early intensive for two or more years acquire sufficient skills to participate in regular classrooms with little or no additional support. Other children learn many important skills, but still need additional educational support to succeed in a classroom.

4.2. Special education with "TEACCH" and ''ABA" Autism Program

The training of school staff aims to answer the why and how of autism. Lydie Laurent[8] (2016), founder of the school network Epsilon, mother of a child with autism and teacher, dedicated to students with special educational needs is mentioned in the education of students with special needs due to autism. Laurent focused on the Rhτne-Alpes region of France, and the educational part of ABA programs (Applied Behavior Analysis), TEACCH (Treatment and Education of Autistic and Communication Handicapped Children), and the pedagogy of Montessori. She highlighted the importance of school integration that begins when faced with a child with autism. So, the school which really wants to support the child with special education and inclusive programs organizes expert training

8 Laurent, L. (2016). *D'une classe a l'autre: Identifier les gestes professioneles qui favorigent l'ecole inclusive.* Paris: AFD.

for school staff. The conference suggested ways to develop these services by raising the issue of human resources, the issue of the training content, while leaving open the issue of financing.

The school integration and special training with ''TEACCH'' autism program[9], is a university-based system of community with regional centers that offers a set of core services along with unique demonstration programs meeting the clinical, training, and research needs of individuals with autism spectrum disorder, their families, and professionals. It was founded by Dr Eric Schopler in 1972, in the state of North Carolina, and the TEACCH is a model for other programs around the world and provides clinical services such as initial referral and consultation, diagnostic evaluations, family consultation sessions and parent support groups, social and educational play and recreation groups, individual counseling for higher-functioning autistics, and supported employment. In addition, TEACCH autism program conducts training nationally and internationally and provides consultation for teachers, residential care providers, and other professionals from a variety of disciplines. The context of the TEACCH autism integration programs has the following core values:

- **Teaching:** share our knowledge of ASD and increasing, sharing the skill level of others through innovative education, teaching, and demonstration models.
- **Expanding:** committed to expanding our own knowledge and that of others to ensure that we offer the highest quality, evidence-based services for individuals with ASD and for their families across the lifespan.
- **Appreciating:** understanding and appreciating the unique strengths of people with ASD and their families.
- **Collaborating and Cooperating**: embodying a spirit of collaboration and cooperation in our interactions with colleagues, individuals with autism and their families, and members of the larger community.
- **Holistic:** stressing the importance of looking at the whole person, their families and their communities throughout their lifespan.

The TEACCH autism program is defined with the strategic goals by excellence in community-based services and beyond childhood, having met the growing needs of adults. The TEACCH clinical and educational programs are expanding to meet the early detection and intervention needs of infants and toddlers with ASD, their families, and professionals who serve them. Also, the TEACCH autism program provides exemplary training programs for students and current professionals to ensure a well-qualified autism creating a well-qualified workforce to meet the expanding numbers of individuals with ASD across the lifespan.

9 The TEACCH Autism Program, Chapel Hill, North Carolina: In: http://www. teacch.com/clinical-services (accessed on 15/12/2016).

The Applied Behavior Analysis programs (ABA[10]) is defined as a tool kit to help parents work with their children's applied behavior analysts. Although the tool kit has developed with children and teens in mind, it also contains helpful information for those wanting to better understand and support an adult with autism. It has already been mentioned, behavior analysts began working with young children with autism and related disorders in the 1960s. The early techniques often involved adults directing most of the instruction. Some allowed the child to take the lead. Since that time, a wide variety of ABA techniques have been developed for building useful skills in learners with autism – from toddlers through adulthood. These techniques can be used in structured situations such as a classroom lesson as well as in "everyday" situations such as family dinnertime or the neighborhood playground. Some ABA sessions involve one-on-one interaction between the behavior analyst and the participant. Group instruction can likewise prove useful. Behavior analysis is a scientifically validated approach to understanding behavior and how it is affected by the environment. In this context, "behavior" refers to actions and skills. The "environment" includes any influence – physical or social – that might change or be changed by one's behavior. On a practical level, the principles and methods of behavior analysis have helped many different kinds of learners acquire many different skills. The applied behavior analysis focuses on the principles that explain how learning takes place. Positive reinforcement is one such principle. When a behavior is followed by some sort of reward, the behavior is more likely to be repeated. Through decades of research, the field of behavior analysis has developed many techniques for increasing useful behaviors and reducing those that may cause harm or interfere with learning. The ABA[11] is defined with the use of these techniques and principles to bring about meaningful and positive change in behavior and has demonstrated that many children with autism experience significant improvements in learning, reasoning, communication and adaptability. In addition, the parents of the children who receive intensive ABA report greater reductions in daily stress than do parents whose children receive other treatments. Generally, the children who receive intensive ABA treatment make larger improvements in more skill areas than children who participate in other interventions.

The special educators Sylvain Goutaloy and Véronique Dussart (2016) adapted programs and methodology as TEACCH and ABA in specific vocational education (VE) at (11) eleven adolescents and young adults with autism, of which five (5) had the opportunity to stay in it. The center for vocational retraining was made for people without special educational needs and disabilities. Students with

10 The applied behavior analysis programs: In: http://www. autismspeaks.org/what-autism/treatment/applied-behavior-analysis-aba (access on 05/01/17)
11 Εκπαιδευτικό σύστημα της Γαλλίας: In: http://www. autismeurope.org (accessed on 15/12/2016)

autism fall without destabilizing and have zero serious disturbances in behavior and could be supported in school and professional integration with the care of special educators, a psychologist and a psychiatrist. These concepts are taught in order to understand the working time and leisure time in small steps and in accordance with the pedagogical principles in small groups or individually. Even taught by joining the special skills workshop concerning working sequences, complete or break it, using pictograms tools. With these recorded informal learning for understanding the atomic time and how it is represented to them in time and lunch time and visualized the atomic storage of personal objects spaces, reception areas, and individual workplaces.

4.3. School Integration and Physical Exercise with Activities Windserfing

The Montessori Autism Programs (MAPS[1212]) have an evidence based, scientifically proven interventions in after-school, inclusion play group therapy programs complimenting the Montessori method. It serves children 3 and above with developmental delays. MAPS provides an initial assessment and sets individualized short and long term goals utilizing a child's play preferences. The social skills playgroups run two or three times per week for one and one half hour sessions. The behavior skills are provided by pedagogists in-home and community-based social skills and behavior skills services. The mission of MAPS is to build a community that offers children a guided path to develop social skills and friendships, improve quality of life and support families so they may better contribute and participate in the world. The MAPS is also defined as a unique and remarkable pedagogic and clinic that provides dedicated, pedagogical and therapeutical services to children with all types of developmental delays. The inclusion programs have a strong child development foundation, which know not just how to teach children, but what the children should be learning, understanding where a child resides in developmental patterns and sensitive periods. Also, what the child's play style, preferences and strengths are allow us to set specific, accurate and relevant goals and teach new skills in ways that the child most likes and most naturally learns. The use of the positive behavior system as alternate educational model which has been very successful teaching children new skills that eliminate misbehavior, according to strong humanistic and respectful values and teach children appropriate social skills in ways that are carefully designed to be enjoyable for the child. The mission of MAPS is to build a community that offers children a guided path to develop social skills and friendships, improve quality of life and support families, so they may better contribute to and participate in to the world. The programs have evidence based, scientifically proven therapies, including: peer inclusive play

12 The Montessori autism program: In: http://www. mapsautism.com (accessed on 05/01/17)

groups, Montessori philosophy and method, positive behavior support, positive discipline, and social and emotional education.

Jean-Marc Saint-Geours (2016), chairman of the Committee Surf of the French National Association for the development of Surfing, the official of the federation of the disabled and co-founder of the association "The waves and children" proposes actions for autism and sports. This is a story of friendship and passion to Handisurf - national association that seeks to share the happiness that gives the sport to integrate the problematic situation of people with disabilities in the public good activities in the water with the canoe. Those who benefit from the activities carried out by the project are the children and young people, since the main priority is to diagnose autism or people affected by other disabilities.

Furthermore, his values of MAPS are defined by the clinicians Djea Saravan, and Isabelle Mytych (2016) who work in the Regional Physical Care Centre with emphasis pain and mental health and autism. They have reported that there are very few studies on the prevalence of obesity in people with TSA[13] (Troubles du Spectre de L'autisme) and the influence of psychotropic drugs known to increase the body weight (ANAE : Approche neuropsychologique des apprentisages chez l' enfant). The result of a retrospective study in humans with autisme highlights a potential link to treatments with psychotropic and suggests issues to prevent a balanced diet and proper exercise.

5. Review of those presented people with Autism in French

Josef Schovanec (2016), doctor of philosophy and social sciences, a graduate of Sciences-Po University in Paris, diagnosed with Asperger's syndrome[14] is another example of school integration. This could be condensed in words - advice to support autism[15].

- I am "autistic." I'm first, foremost, and always a person, a student, a child, and I have autism. Do not get me confused with my situation. And, please, do not use the term in a negative or reckless manner. I deserve your respect.
- I am a person with autism. Make an effort to get to know me. Ask me or my friends and my family, if I cannot provide an answer about my dreams.
- I need the services, just as all children do. The services begin early for me. Many countries apply screenings for developmental disabilities. If they started early, my life would be different!

13 Magerotte, G. and Évrard, P. (2016). Troubles du Spectre de l'Autisme, Dossier, *ANAE : Approche neuropsychologique des apprentisages chez l' enfant,* vol. 26, n° 144, tome v

14 Lussier, F. and Flessas, J. (2009). *Neuropsychologie de l'enfant – troubles dıveloppementaux et de l'apprentissage.* Paris: Dunod.

15 Fuentes, J. (2014). Autism Spectrum Disorders:Ten Tips to Support Me. *Journal of τhe American Academy of Child & Adolescent Psychiatry, 53*(11), σσ. 1145-1148.

- I need the health care system, like all children and is included in the regular health care.
- I can be educated in mainstream schools with community settings. Please don't separate me from education.
- I live with my family.
- I belong in to the society and can take vocational training. I want services to support me during my adult life and I can participate in the integration in all activities of my community. Your goal should be a customized environment and address is sufficient to modify the settings and attitudes that will make our society better.
- I also have human rights, because I am faced with discrimination. Many of us live in poverty without the community support system. Some of us are immigrants or minorities, including sexual minorities. Keep the gender dimension. Girls and women with autism are often at greater risk of violence or abuse.
- I belong to the world. I have a role to play. Please do nothing about me without me.

Xavier Grosclaude (2012), vice-president de Fenêtre sur l'Europe[16] of the European commission explicitly excluding the attachment from autism to infantile psychoses and a year before, in 2004, the national institute health and medical research (INSERM: Institute National de la Santé Et de la Recherche Médicale) stressed, in a report submitted to the general management of health, the major utility of therapies cognitive-behavioral treatment of autism to the detriment of psychoanalytic therapies.

In fact, autism in France has always struck at a mixture of incomprehension, in the first place, that of the medical world cultural approach to the psychogenetics, and inertia promoted by the sealing of financing circuits between the health, medico-social and educative. By the law of February 11, 2005 on "equal rights[17] and opportunities, participation and citizenship of disabled people" establishes that the principle of access to education should be provided, if possible, in the regular school and closer to home. A disabled student may be entered individually into mainstream schooling. The right to education of a student with disabilities is part of custom training project. Individually, the project coordinates the procedures and all accompanying educational, psychological, educational, medical and paramedical social services that complement formal education and is necessary to meet the specific needs of the student and to ensure consistency and continuity in their schooling.

16 Autisme-Europe In: http://www. autismeurope.org (access date on the Internet 05/01/ 2017)
17 LOI n° 2005. (2015). *Pour l'égalité des droits et des chances, la participation et la citoyenneté des personnes handicapées.* Paris: JORF n°36 du 12 février 2005.

6. Conclusions and recommendations

Today, the challenge for France[18] is to register as soon as possible in this dynamic by breaking away from the conservatism inherited from the past. Even if nothing is , several European countries have mobilized their collective intelligence to find solutions humanely, socially and financially satisfactory. The advancement of knowledge research in 1965, the arrival of the electroencephalogram allows to refute the theory of the mother-child relationship so as to highlight other possible causes to autism. For example, one of the theories advances at this time establishes the autistic people to decode their environment, with the consequent difficulties communication. This hypothesis the development of educational models such as TEACCH, ABA or MAPs, given tools for the autistic people to better integrate their environment. Subsequently, various studies have identified brain and neurological causes possibly responsible for autism. Overall, it must be recognized that the most virtuous European countries in autism have made the respect of people with autism the central axis of their social integration policy. This is true for children but also for adults with, for example, the existence of houses in Sweden allowing autistic adults to live in, with a roommate where appropriate.

The scolarization for the students with autism into the national education system in France is achieved with the accompaniment of handicapped using approximately 50,000 contracts for one schools period assisted by auxiliaries of school life (AESH: accompagnants des élèves en situation de handicap). Also, the implementation of medico-social accompaniment and care is achieved accompanying services in support of a school career, a professional life in an ordinary environment and an autonomous dwelling. A specific part of this intervention strategy devoted to polyhandicap: it will focus in particular on the training of care and support teams, the strengthening of medico-social structures and the support of families. Also, through the improvement of the conditions of access of disabled college students to vocational streams and apprenticeship from the Ministry of Education circular in preparation, dealing with orientation, internships and attestation of competences.

In conclusion, it was stressed that the situation for children and adults is difficult. The autism ignorance is still prevalent in France. Thus, knowledge of the prevalence of autism, early diagnosis, and the lesser-known health problems such as combating obesity and maintaining health through sport custom autism, could reduce the special education problems of person with Autism in France.

Because ignorance means ignorance of tools and skills necessary for entry into an appropriate curriculum. The adults are the forgotten age group of all autism plans, so it is necessery to learn how to implement housing programs,

18 Grosclaude, X. (2012) L'Europe sera l'avenir de l'autisme français in the Tribunes Parlementaires Européennes L'autisme, Grande Cause Nationale In: http://www. Fenetreeurope.com (accessed on 15/12/2016)

supported together with specific modules of specific training. The testimony of a person with Asperger's mother says that she waited 60 years for a diagnosis, which shows the extent of the delays. The good practices and services come from the Canada-speaking Quebec, where there is an emergency service 24h / 24h provided at home to manage people aggression crisis with autism and teaching members good practices to improve family support methods.

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