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## Exploring electronic storybooks to enhance multiple intelligences

### Η καλλιέργεια των πολλαπλών νοημοσυνών μέσα από την εξερεύνηση των ηλεκτρονικών μυθιστορημάτων

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*This paper presents a research that was conducted in the Greek EFL primary school context and which studied the effective use of electronic storybooks. Emphasis was shifted from simply learning content to the interaction of the learner with an online content in a blended-learning environment. Self-exploration was the foundation stone of self-regulation, engaging the learners in independent learning activities. Children's learning was enriched, their autonomy was reinforced and multiple intelligences were developed. Collaborative learning definitely resolved the 'Gordian knot' of problem-solving situations through knowledge sharing and interaction and opened a window for the development of the cognitive mind. The social context brought into surface a wide range of children's resurgent artistic, visual or acting talents which mediated for the enhancement of interpersonal and intrapersonal skills. The knowledge gained from the above learning process and the way learners were involved had a positive impact on intrinsic motivation.*

Ω

Η εργασία αυτή παρουσιάζει μια έρευνα που έγινε σε ένα Ελληνικό δημοτικό σχολείο με αντικείμενο την αποτελεσματική χρήση των ηλεκτρονικών μυθιστορημάτων (e-books) στο μάθημα των Αγγλικών. Το κέντρο βάρους της έρευνας μετατοπίστηκε από την εκμάθηση της ύλης στην αλληλεπίδραση του μαθητή με ένα διαδικτυακό υλικό μέσα από ένα περιβάλλον συνδυασμένης μάθησης (blended-learning environment). Η αυτοεξερεύνηση των μαθητών ήταν ο ακρογωνιαίος λίθος της αυτοαξιολόγησης και του αυτοελέγχου τους (self-regulation) μέσα από μια αυτόνομη μαθησιακή διαδικασία. Οι γνώσεις των παιδιών εμπλουτίστηκαν, η αυτονομία τους ενισχύθηκε και οι πολλαπλές νοημοσύνες τους καλλιεργήθηκαν σε αρκετά μεγάλο βαθμό. Η συνεργατικότητα των μαθητών οδήγησε στην 'επίλυση των προβλημάτων' (problem-solving situation) μέσα από την ανταλλαγή απόψεων και την αλληλεπίδραση ανοίγοντας ένα παράθυρο στην καλλιέργεια της νοητικής διαδικασίας. Το ομαδικό περιβάλλον έφερε στην επιφάνεια μια ευρύ γκάμα αναδυόμενων ταλέντων που σχετίζονται με την καλλιτεχνία, την ηθοποιία και την οπτική νοημοσύνη των μαθητών. Οι δεξιότητες αυτές με τη σειρά τους μεσολάβησαν για την βελτίωση της διαπροσωπικής και

*ενδοπροσωπικής νοημοσύνης. Ο εμπλουτισμός των γνώσεων από την παραπάνω μαθησιακή διαδικασία καθώς και η ενεργή συμμετοχή των μαθητών είχαν ένα πολύ θετικό αντίκτυπο στην εσωτερική τους παρώθηση.*

**Key words:** blended-learning, multiple intelligences, media literacies, motivational attitudes

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## 1. Introduction

Electronic storybooks (ES) are becoming prevalent in education as one way to teach students about content, literary features such as narrative structure, cohesive devices, coherence, well-edited paragraphs (app. 11a) and even technology itself (Downes & Fatouros, 1995; Eagleton & Hamilton, 2001; Lehrer, Erickson & Connel, 1994; Leu & Kinzer, 2000, Author, 2002). Relevant research has shown that they offer traditional literacy the possibility to be taught within a multimedia context (Chen, Ferdig & Wood 2003) while simultaneously they assist young readers in building more complete content schemata and therefore reach more complex levels of story understanding. Their interactive features support students in building electronic scaffolds which serve as the foundations on which they develop their digital literacies. Animated illustrations facilitate struggling readers' comprehension (Ertem 2010) and create settings that trigger children's' imagination (Lorien & Lorien, 2001). Glasgow (1997) found that cd-rom storybooks motivated students to read. Matthew (1996) found that comprehension was higher for pairs of third grade children who used ES than for those who used the traditional print versions of the same story.

The present research explored whether the use of ES contributes to young learners' linguistic, cognitive, affective and social development. Its basic aims were to explore the degree of intelligences' development within a blended learning (BL) environment. The term 'blended learning' describes a solution that combines different delivery methods, such as collaboration software and web-based interactions. It mixes various event-based activities, including face-to-face classrooms (FtF), live e-learning and self-paced instruction. BL views the Internet and the Web as integral components of any contemporary educational system (Author, 2009a).

Different forms of ES such as online and cd-rom electronic storybooks were taught to seventy four fourth and fifth graders. There was an initial challenge to engage learners in activities combining traditional and new forms of literacies. The technology-enhanced environment would help participants integrate their traditional writing and reading strategies into media literacies. By the same token, cd-learning would promote students' oracy skills and come up with new interactive patterns combining self-paced, team and computer-assisted learning. It was also expected that new motivational attitudes would emerge out of the problem-solving situations. The research project lasted six months, from November to April 2010 and was realized in a primary school situated in Igoumenitsa, Greece. The design of the research is described in detail in section 3 after the theoretical framework that follows in the next section of this paper. Having described the research, we present our findings and make recommendations for further research in sections 4 and 5 consecutively.

## 2. Theories of instruction and their use in the selection of ES

The use and design of educational software used in ES is definitely affected by a number of theories. Behaviourists' and especially Skinner's (1968) contribution is obvious as they tend to describe their models in terms of stimulus and response (S-R). Positive reinforcement (in the form of recycling rules and vocabulary items) helped a particular behaviour reoccur. Piaget (1967) claims that we not only learn through reinforcement but thanks to our constant struggle to 'construct meaning', through hands-on experience. His theory of assimilating new information by relating them to one's existing experiences applies to the present study as children were exposed to rich audiovisual stimuli emerging from media literacies.

Moving a step further, Vygotsky (1978) assumes that social interaction mediates for the cognitive development of the individual. In the present case, more mature learners and the teacher-researcher intervened during pair or group work activities. 'Scaffolding' was realized in the form of questions and answers, creative discussions and *problem-solving tasks*. Bruner (1983) sees language as a tool for cognitive growth. Children often receive 'finely-tuned' input or scaffolding to carry out an activity (Wood et al., 1976). Bruner's theory of 'formats and routines' allow 'scaffolding' to take place and combine the security of the familiar and the excitement of the new. This applies in the e-book format where learners listened to stories from different media forms and felt familiar.

Gardner (1993) emphasises the multiple intelligences (MIs) via which students can promote their learning. His theory categorizes their intelligences as such: linguistic, interpersonal, emotional, logical, intrapersonal, kinesthetic, visual and musical.

### 2.1. Linguistic intelligences

Multimedia and the net incorporate all the elements of skill work, including literacy skills. Computer mark-up languages offer sophisticated tools for marking up text, audio and video (Mills, 2000). Students can highlight, gloss, modify or elaborate a linguistic item if they request so. Education of the citizenship in the digital world as well as a new vision of society based on knowledge sharing are the keys for the transformation towards information societies (Pimienta, 2002). As they engage into online story sharing, the young learners do not just read the story dialogues but they read between the lines. They exchange ideas with their classmates and resort to online grammar checkers in order to clarify the story messages. Children feel like 'little researchers' as they get prepared for a short story writing. The ongoing negotiation of both form and meaning -during the actual writing procedure- makes children feel more like 'authors' than mere writers (Warschauer, 2000). It seems that they take responsibility of their own learning as they compose, share and finally display their short story versions on the net.

### 2.2. Interpersonal intelligences

Interactivity reinforces the understanding of meaning when it comes to learners' exposure to an online listening text or story dialogue. When the computer responds to the user's input "...learners have a higher probability of understanding what they hear" (Loschky, 1994, p.319). An interactional view sees language "as a vehicle for the realisation of interpersonal

interactions and for the performance of social transactions between individuals...” (Richards and Rodgers, 2001, p.21).

### **2.3. Emotional intelligences**

Additional to socio-cultural context in supporting child’s thinking, the emotional state reveals its own bonds with cognition. The two of them are ‘dynamically linked and work together to process information and execute action’ (Bell and Wolfe, 2004, p. 366). Children have to tolerate their feelings in the process of exploring e-books. Dweck (2000) describes children as having either a ‘mastery-oriented’ or ‘helpless’ reaction, particularly when they experience difficulty or failure. According to McNaughton (2003), ‘pleasure, desire and emotions are powerful motivators of learning that drive our actions and interactions with others’ (p.53).

### **2.4. Logical and intrapersonal intelligences: a cognitive challenge**

Children get rich stimuli from e-story scenes and settings and infer personality traits from the e-characters as “the computer offers communication tasks with high cognitive demands and high contextual support” (Mohan, 1992, p.124). This is the case of ‘problem-solving situations’ where it is easier for learners to come down to any conclusions through reasoning and close observation as they organize their thinking around core concepts (Medina, 2009), such as location, time, characters’ goals and roles. Through this struggle, learners achieve a ‘sense of self-control, self-management, self-direction and independence’ defined as ‘self-regulation’<sup>1</sup> (Bronson, 2000, p.3). Children also tend to think their actions over and over again struggling for possible explanations enhancing metacognition, which according to Papaleontiou-Louca (2003) is ‘cognition about cognition...thoughts about thoughts, knowledge about knowledge or reflections about actions’ (p.10).

### **2.5. Visual, kinesthetic and musical intelligences**

Media literacies, as we have seen, offer another medium that addresses Gardner’s (1993) kinaesthetic intelligences. For example, the hands-on interactivity of navigating through software-based programs with a keyboard, mouse or touch window enhances the kinaesthetic intelligence. Page-turning, for example, requires different sets of motor abilities (hold-point-click) than in a real book (grasp-lift-place).

Visual imagery stimulates mental representations (Medina, 2009; Veenema, 2001) and boosts memory. On the other hand, engaging learners in multimedia activities that incorporate sound files (mp3, mp4, mpeg) increases the amount of information a student remembers and retains. According to Computer Technology Research (CTR) Corporation, people retain only 20% of what they see but they remember as much as 80% of what they see, hear, and do simultaneously (Hofstetter, 1997).

## **3. The research data and design**

The research focused on pupils’ multiple intelligences which, according to the authors of this paper, ‘form a part of children’s cognitive growth’. The seventy-four primary school learners

had not had any contact with school electronic material of any kind before. More analytically, the questions the research addressed can be summarized as follows:

- How can self-paced and collaborative learning challenge the cognitive state of mind in a young learner's context?
- How can the knowledge gained through *problem-solving situations* lead to different motivational attitudes?
- What is the degree of multiple intelligences' development within a blended-learning environment?

The research was based on two questionnaires, a needs analysis questionnaire and an evaluation questionnaire including six datasets of similar question forms. The first questions investigated the familiarisation of learners with ES and the reasons why learners would like to study ES. The proposed reasons were the boosting of self-confidence, the learning of a foreign language in a non-stressed environment, the implementation of new cooperation techniques and the acquisition of Information Technology (IT) skills. Learners had also to choose between traditional teacher instruction and student online self-exploration (or both) in terms of their preferred teaching mode. Furthermore, they had to evaluate various cooperation modes, including individual work, teacher's help, computer's help (video, sound, text) and group work. Coming to the dataset of multiple intelligences, the research focused on MI's growth by examining a number of variables, such as the degree to which students can handle word, word art or computer's audiovisual aids (app. I).

The aforementioned questionnaires included Likert-scale, alternative-answer, checklist and ranking questions and contributed to the quantitative analysis of the research. The SPSS programme<sup>2</sup> helped the researcher to present descriptive statistics in bars and charts. The tools that contributed to the qualitative results were parts of video-taped sessions, group interviews and an observational checklist. During the experiment, the researcher closely observed students' learning behaviour and interactive patterns, gathered data and checked whether students could fulfil certain activities at a satisfactory degree. The researcher, for example, could easily categorise a learner as 'visual' if he or she focused mainly on audiovisual help options. Howard Gardner and the Project Zero team (2001) at Harvard University clearly state that documentation in the form of written or audiovisual recorded observation made by adults makes children's thinking process visible. It forms the basis of the 'developing mind' as children reflect upon their ideas.

A number of tests measured the reliability and validity of variables. Chi-square tests<sup>3</sup> determined whether there was a significant difference between the expected and the observed frequencies in the datasets. Furthermore, a non-parametrical test, the Kolmogorov-Smirnov<sup>4</sup>, tested the validity within the variables of MI's dataset (app. I) before and after the experiment. The Cronbach's alpha test<sup>5</sup> also measured the internal consistency, which is, how closely related the set of MI's items are as a group. A 'high' value of alpha is often used as evidence that the items measure an underlying construct, as shown in the table 1 below.

Case Processing Summary				Reliability statistics	
		N	%		
Cases	Valid	72	100,0	Cronbach's Alpha	N of Items
	Excluded <sup>a</sup>	0	,0		
	Total	72	100,0		

a. Listwise deletion based on all variables in the procedure.

Notes: The alpha coefficient for the fourteen items is .761, suggesting that the items have relatively high internal consistency. A reliability coefficient of .70 or higher is considered "acceptable" in most social science research situations.

Table 1: The Cronbach's Alpha reliability test of MI's datasets

A parallel syllabus consisting of four story-based units was taught to the participating students. Students could use CD-ROM material and online resources to work on different non-linguistic subjects without needing to resort exclusively to course books (Author, 2009 b). A number of strategic skills were proved to ease children's online exploration. The pupils attempted to carry out the online story activities within a time limit, setting their expectations high at the same time. This added a degree of anxiety on their performance scale but also motivated the participants to use the computers' help options. The students became even more friendly, open and willing to talk so as to prove to themselves that they could manage well without teacher's help. At times they were more persistent, paying attention to keywords or even combining any kind of information in order to catch 'the thief' or find 'the stolen statue'. All the above strategic skills (expectation of success, anxiety, intrinsic interest, time and self-management, persistency and help-seeking strategies, connecting newer to older knowledge, finding essential points) eased learners' exploration of e-books.

#### 4. Findings and discussion

The presentation of the research findings collected from multiple sources has shed light on the parameters of the teaching and learning procedure. They showed the beneficial effects of self-exploratory study as well as peer collaboration during the study of electronic storybooks. New literacies were introduced into the web-based environment with the teacher's support. The combination of different learning modes played a significant role on the growth of learners' multiple intelligences. The evaluation of the findings is presented in sub-sections.

##### 4.1. Self-paced and Collaborative Learning within a blended-learning environment

Children were observed to make use of self-exploratory techniques to cope with the challenging levels of the narration tasks. The heroes of the story (Digger and the gang) are encountered with unexpected and escalating problems –they are trapped, their lives are in danger, they reach a dead-end in their attempt to escape. The age of the learners enabled



them to incorporate new information into existing structures, according to the Piagetian theory. Each learner carries his own experiences of dangerous situations he has been exposed so far – being lost or trapped in a desert place. In a sense, it seems that the learners are both the ‘protagonists’ and the ‘observers’ of the story. They retrieve and ‘activate’ any ‘back-up’ memories or know-how of their own past in their attempt to exploit any ‘story clue’ that comes to their way.

The majority of the target learners involved was observed to be monitoring their thinking, controlling and directing their concentration (app. IIb). Judging from the learners’ interviews conducted as soon as the experiment was over, we can conclude that the learners had the freedom to choose whether or not to engage in such self-regulating behaviour. When they chose a self-explanatory path, they controlled their attention and monitored their performance. Their impulse control encouraged them to make their own decisions while having the goals set in mind. Child self-initiated activities may often provide the best contexts for problem-solving and thinking extension (Lambert, 2000; Siraj-Blatchford et al, 2002).

In the case when a more knowledgeable and skilled student took the teacher’s role as a facilitator, the struggling learners were more relaxed and more eager to search for a viable solution by watching their peers’ movements. This implies that when working with other, more competent children, the struggling students may be less likely to question the experts’ ability. They often gain confidence through mimicking the other child or even develop their metacognitive thought by just watching (Whitebread et al, 2005). The observation checklist also pointed that the team members exchanged verbal interactions for the transmission of ideas (app. IIb). Language mediated for peer cooperation and thought-provoking discussion. As a matter of fact, another implication is that *self-regulation* was also co-constructed by the child with the assistance of his peers.

The researchers emphasized ideas of thinking and reflection by asking learners metacognitive prompts during interview sessions. Questions such as ‘what did you think might happen?’ or ‘how did you feel about that?’ determined the value of adult use and modeling of metacognitive awareness, including identifying what the learners did not know, generating questions and thinking aloud (Papaleontiou-Louca, 2003). Self-regulated learning is in fact promoted if learners have choice and opportunities to control the level of challenge in tasks, either through self-exploration or cooperation techniques (Healey, 2007). Opportunities for them to evaluate both their work and that of others were always effective, as the learners received their classmates’ feedback.

#### **4.2. Motivational Attitudes through Problem-Solving Situations**

The view that children are problem-solvers is a central tenet of a number of theorists (Bronson, 2000; Bruner, 1983; DeLoache & Brown, 1987; Piaget, 1967; Wood 1998). This view is closely related to self-regulation and logical intelligences. This was the point where critical thinking and creative thinking were applied in the process which culminated in a product (DeBoo, 1999; Fisher, 1990). Problem-solving is by and large a goal-oriented activity. The current research provided a powerful illustration that learners adopted a more positive attitude to learning thanks to their ‘cheerful disposition’ and their ‘willingness’ to act on their own. While listening to their interview sessions, one could easily notice learners’ ‘readiness’ regarding the upcoming cognitive challenges they had to face (app.IIb). Learning

dispositions have been described as a combination of motivation and ‘situated learning strategies’ (Carr, 2001, p.9). In that respect, the online problem-solving context played a fundamental role for motivational growth, combining positive mood, personal interest and skills. What’s more, we concluded that the learners’ inner desire and psychological state in a given problem-solving context were determinant to the tasks’ completion.

Bearing that in mind, the target learners displayed two different patterns of motivation that reflected their attitude to learning. On the one hand, there were the mastery-oriented students that tended to engage in self-motivating strategies, self-instruction and self-monitoring. People with high self-efficacy—that is, those who believe they can perform well—were more likely to view difficult tasks as something to be mastered rather than something to be avoided. The degree of the individuals’ self-efficacy depended on how good they thought they had been before the challenging computer-mediated tasks. They were exhorted to ‘stick with it’ no matter what the outcome would be. They really seemed to ‘embrace difficulty with relish’ (Dweck, 2000, p.10). Baumeister et al. (2005) support Dweck’s view and suggest that high self-esteem –when students feel competent and pride of themselves –improves persistence.

On the other hand, the helpless students lost faith and concentration on their task at hand. They gave up trying more quickly than mastery-oriented students and blamed themselves personally for not doing well. They explained that they had difficulty in remembering things, in getting the message of the activity and in understanding the unknown words. As a result, their attention was redirected on other activities which attracted their attention. Dweck suggests that such response “impairs students’ ability to use their mind effectively” (Dweck, 2000, p.9).

It was also often the case when, we noted down many areas of conflict in the conversation between the pair members. There were times when we observed arguments and counter arguments regarding which way the pair should follow. This was a direct implication that the children had different goals in mind when they worked towards the unfolding of the same kind of mystery.

Moving towards mystery solution, the target learners did not have any particular plans in mind. What they did, was that they tried out different paths to ‘find their way out’ but in no particular order. They may often have repeated themselves for no particular reason. This was proved to be the simplest planning strategy, that of trial and error, a characteristic that mainly concerned less experienced computer users. The last ones could not visualize the overall picture of the problem at hand and took to fragmentary moves, whereas learners having more expertise managed to reflect on the aftermath of their actions at hand. In both cases, the learners processed information with the outmost aim to solve a problem. Hope (2002) relates problem-solving to learning, asserting that “when we solve a problem we learn something new” (p.265). According to our observations, it is implied that problem-solving (screenshot 1, below), as a generalized skill, is a valuable learning-mental activity that contributes to children’s holistic development.





*Screenshot 1:* This picture shows an electronic storybook consisting of three parts. The readers were engaged on exploratory techniques to unfold the mystery (problem-solving situation) ([http://www.bbc.co.uk/schools/digger/9\\_11entry/9\\_11.shtml](http://www.bbc.co.uk/schools/digger/9_11entry/9_11.shtml))

In the context of problem-solving, there were certain children who were unwilling to cooperate with the classmates the teacher told them to. What they themselves reported was that they would prefer to sit next to their friends instead. That was another remarkable finding implying that children in friendship were more successful in problem-solving activities than non-friends (Smith et al, 2003). This phenomenon was observed throughout the experimental procedure and related to the learners' willingness to discuss and constructively evaluate their solutions together.

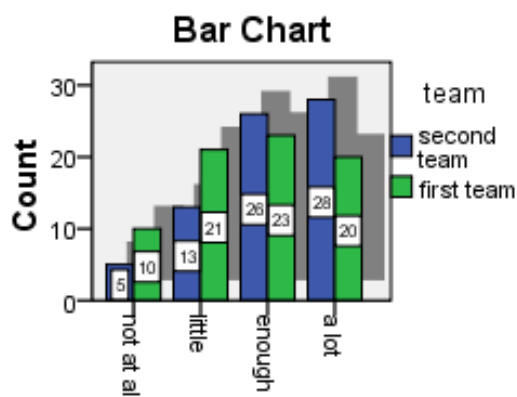
In the context of a close friendship, children made more efforts to conciliate, negotiate and made compromises because they cared for their friend and wanted to maintain their relationship. Friendship 'is a context in which moral understanding is demonstrated very early' (Dunn, 2004, p.157). Even where the children sitting together were not friends but came to terms with each other, they could easily exchange and resolve differences of opinion. This was further reinforced in novice-expert pairs (Katz and Chard, 2000). Another remarkable finding denoting the children's disposition to online learning was that certain learners declared their intention to work alone. This was often the case of more competent users who stated that they were not used to working with a partner and that it would be better if they were left all alone. In that case, the teacher consented to that initiative as long as it would be productive and served its purpose. Even in this case of solitary play, children had more time to think and more space to reflect privately, supporting the problem-solving theory (Lloyd and Howe, 2003).

### **4.3. Multiple Intelligences development**

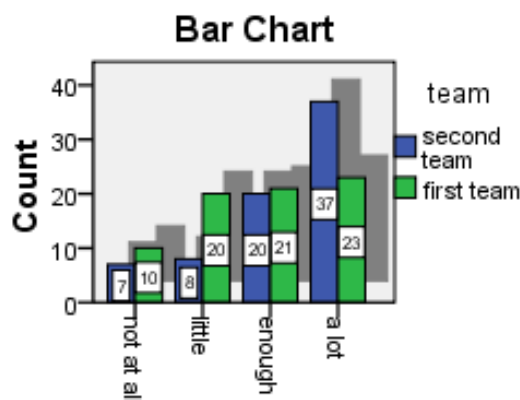
Motivational attitudes were further enhanced by the implementation of artistic, visual and kinesthetic skills. By asking the children to 'draw a storybook scene', the teacher mixed the notions of 'electronic narrative' and 'display'. The learners were keen to access the web interface design and subsequently spent time in 'dressing' and coloring their favorite cartoon heroes. The computer tools afforded the target learners with an avenue for their artistic representation which validated their kinaesthetic skills.

The children's computer-mediated drawing was a mental 'remaking' and a visual representation of that internal remaking. It showed salient elements of a storybook in a particular arrangement –in a line, ordered by size; and in a particular relation to the maker of this representation (video recordings). Anning and Ring (2004) comment on the empowering nature of children's opportunities to be so fluid in their representations. Children's creativity was supported as 'their body senses gathered evidence' (Prentice, 1994, p.127), *enriching* their cognitive schemata. Children express their ideas among group

members and make ‘powerful intelligent hypotheses’ (Mathews, 2003, p.01), as shown in charts 1 and 2 below.

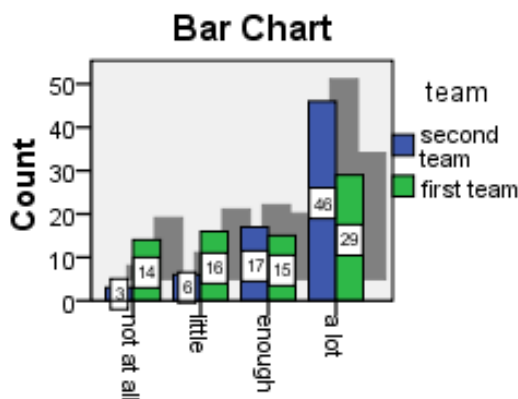


Bar chart 1 A bar chart of the MI’s dataset, comparing the same team’s preferences on variable 2 (observe the pictures and videos on the screen and link them with new expressions) before (first team) and after (second team) the experiment



Bar chart 2 A bar chart of the MI’s dataset, comparing the same team’s preferences on variable 7 (enrich your knowledge and share your opinion among group members) before (first team) and after (second team) the experiment.

The cognitive act of reshaping an event from the learners’ point of view eased the link between conceptual meanings and their visual representations. The target learners had physical and direct experience with the computer. The learners exteriorized their inner feelings to be later transcribed in ‘poetic words of art’, as shown in chart 3, below. The children were free to draw and color their favorite story scene using word art and painting tools. They manifested their own ‘systems of perceiving the world’ which are important aspects of the development of metacognitive thinking and perspective taking (Brooks, 2004).



Bar chart 3: A bar chart of the MI's dataset, comparing the same team's preferences on variable 3 (draw and color by clicking on icons) before (first team) and after (second team) the experiment.

Going beyond the intrapersonal reflection, the most widely praised feature of these three-dimensional 'art words' was that the learners found an opportunity to discuss their designs along with their partners. Through drawing and coloring, the young children could express their intentional theories visually. Vygotsky (1978) would regard them as thinking aloud, as well as for sharing with the pair or group members. When the team members gathered around the screen, they had time to pose questions, to test hypotheses, to analyze a situation and to engage in verbal reasoning. Judging from the above facts, we can imply that drawing is a powerful tool not only because "it is immediately holistic and interactive in ways that writing is not" but also because it is "the mediator for an interpersonal dialogic exchange" (Brooks, 2004, p.47-9).

Apart from the visual mode that had a central place in learners' communication, other modes had their own impact as forms of representation and communication as well. Sound, whether in the form of 'soundtrack', 'music' or 'background noise' accompanying a storybook's scene is one of these. The learners could click on words putting them in the right order to form a verse, as if they were composers. They had also the chance to choose their favourite kind of music by playing their favourite disc songs, like amateur deejays. Karaoke software tools helped the pupils to plug their microphones and sing their favourite kids' songs in real time! The learners were finally free to show off by using body movements and facial expressions like dancers.

Exercising bodily and kinaesthetic intelligences was also the case when the children performed a scene, pretending to be the protagonists of the e-book. Like drawing, pretend play also contributed to interaction and verbal communication between two or more 'actors'. Improvisation helped to overcome communication breakdowns. The recordings certified that the 'promising actors' were the embodiment of dexterous actions that manifested many aspects of emotional outbursts, such as cheering, enthusiasm or exasperation.

In that respect, it can also be implied that children's engagement in 'high quality' pretence may assist their linguistic development along with their motor intelligences. Bergen suggests: "Pretend play requires the ability to transform actions symbolically, it is furthered

by interactive social dialogue and negotiation, and it involves role-taking, script knowledge and improvisation" (Bergen, 2002, p.2).

#### **4.4. Limitations of the research**

The above findings are based on a large scale project (seventy four pupils) lasting for a long period (six months). Due to the above reason, another colleague could definitely help the teacher and share the work load. He or she could come up with solutions regarding the handling of the video recording or the note-keeping burden. This would put an end to the restless situation and fuss caused by the simultaneous classmates' questions. Moreover, the shortage of peripheral units such as printers deprived learners from having their 'work product' at hand every time they needed to. On the contrary, they had to transcribe their finished product on a paper. The teacher was not in position to use the audiovisual aids, such as the overhead projector, the display panel and the whiteboard, as much as he wished to, due to space limitations. What's more, the server malfunction did not allow for the display of an activity to all the computer screens in real time.

The hourly teaching sessions were actually limited up to thirty minutes each time. This did not let learners complete their online activities on time but forced them to 'store' their semi-completed activities on the computer memory. Furthermore, there was a 'hit-and-run' attitude on the part of the learners where lack of time prevented them from embarking on sustained storybook exploitation over a certain period of time. Robson and Hargreaves (2005) emphasize the importance of time for activities and time for children to talk about their thinking.

#### **5. Concluding remarks and recommendations for further research**

More research is necessary so that students' gradual improvement on a longer-term basis can be investigated. Children may enhance their intelligences further endorsing the role of a 'researcher'. Specifically, in a future endeavour during the preparation stage, the target learners may surf on the net, locate their desired storybook activities, and plan their favourite tasks or even back up their initial research with alternative and optional choices. The whole idea is about children being 'ready, willing and able...a combination of inclination, sensitivity and relevant skill and knowledge' (Carr, 2001, p.21). In this case, the learners should start observing internet sites containing e-books and recording the diversity of genres, such as comedy, drama, poetic or adventurous e-books. It would be of outmost interest to discover the degree of interconnectedness among the genres in terms of common problem-solving or entertaining tasks. Dealing with a variety of genres means that learners would not be compelled to perform the same activity simultaneously on their computer screens due to homogeneity of the task. The learners would be able to select their own e-book as a starting point to talk about a teacher's task, such as the theme, the protagonists' goal or the design of a favourite scene. They would automatically be in charge of their own learning and more willing to take initiatives in the actual storybook exploration. This new endeavour would be easily implemented in the English curriculum as long as teacher approves of learners' e-books choices dealing with real-life situations. These have to be in accordance with the criteria of homogeneity regarding structural format but heterogeneity and diversity in terms of thematic areas, goal orientation, contextual information and optional solutions. In real life, children spontaneously discover or select

their own goals, the amount of information available will differ or may be diverse and solutions may be equally diverse. Lambert (2000) suggests that an approach which starts from the child's interests is "aligned with how children in the first years of school prefer to think" (p.37).

The concluding findings demonstrated students' gradual progress in FL learning by exploiting different intelligences in accordance with their learning styles. The combination of two different teaching modes, face-to-face teaching with online learning, formed the basis of individual growth through self-exploratory and cooperative modes. Learning to learn within a computer-mediated environment brings into surface new ways of information display. Video, sound, graphics, animation and text are different forms of media literacies that constitute the cornerstone of children's intellectual growth. Online interactive activities help learners to process problem-solving situations in real time. Engaging learners into such adventurous undertakings enhances learners' intrinsic motivation, overall performance and holistic development. ES did not only help us reshape our understanding of how young learners can be better taught to read, interpret texts and express themselves in a second/foreign language but also encouraged us to reconstruct our teaching and explore new modes of instruction.

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### Notes

1. Describes learning that is guided by self-observation (monitoring students' activities), self-judgment (self-evaluation of performance), self-reactions to students' performance outcomes and motivation to learn.
2. A computer programme for data management, statistical (%) and descriptive analysis (bars/charts). It is used mainly for surveys by education researchers.
3. It summarizes the discrepancy between the observed values and the values expected under the model in question (also goodness-of-fit).
4. A non-parametric test (not relying on data belonging to any particular distribution) that can be used to compare two samples (the same number of students -74-before and after the experiment).
5. It is commonly used as a measure of reliability of a sample of items such as questions or indicators of which one might ask to what extent they "measure the same thing". Items that are manipulated are called variables (app. I).

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### References

- Vlachos, K. (2002). *Supplementing a primary school coursebook with stories and technology*. Unpublished MA dissertation. Patras: Hellenic Open University.
- Vlachos, K. (2006). *The use of the internet and asynchronous online networking for the learning and consolidation of English as a foreign language in European primary schools*. Unpublished doctoral dissertation. University of the Aegean, Rhodes, Greece.
- Vlachos, K. (2009a). 'Comparing face-to-face with blended learning in the context of foreign language education and cross cultural communication.' In E. M. W. Ngi (Ed.), *Comparative blended learning practices and environments*. Hershey, PA: Information Science Reference.

- Vlachos, K. (2009b). 'The potential of Information Communication Technologies (ICT) in Content and Language Integrated Learning (CLIL): The case of English as a second/foreign language.' *CLIL practice: Perspectives from the field*, at <http://www.icpi.eu/?id=24>, accessed 14.12.2012.
- Anning, A., & Ring, K. (2004). *Making sense of children's drawings*. Oxford: Oxford University Press.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2005). 'Exploding the self-esteem myth'. *Scientific American*, 292: 70-7.
- Bell, M. A., & Wolfe, C. D. (2004). 'Emotion and cognition: an intricately bound developmental process'. *Child Development*, 75/2: 366-70.
- Bergen, D. (2002). 'The role of pretend play in children's cognitive development.' *Early Childhood Research and Practice*, 4/1, at <http://ecrp.uiuc.edu/v4n1/bergen.html>, accessed 10 January 2010.
- Bronson, M. (2000). *Self-regulation in early childhood: Nature and nurture*. NY: The Guilford Press.
- Brooks, M. (2004). 'Drawing: The social construction of knowledge.' *Australian Journal of Early Childhood*, 29/2: 41-9.
- Bruner, J. (1983). *Child's talk: learning to use language*. New York: W. W. Norton & Company.
- Carr, M. (2001). *Assessment in early childhood settings*. London: Paul Chapman.
- Chen, M., Ferdig, R. & Wood, A. (2003). 'Understanding technology-enhanced storybooks and their role in teaching and learning: An investigation of storybooks in education'. *Journal of Literacy and Technology*, 3/1: 1-15.
- De Boo, M. (1999). *Enquiring children, challenging teaching*. Buckingham: Open University.
- De Loache, J. S., & Brown, A. L. (1987). 'The early emergence of planning skills in children'. In J. Bruner & H. Haste (Eds.), *Making sense*. London: Methuen, pp.108-30.
- Downes, T., & Fatouros, C. (1995). *Learning in an electronic world: Computers in the classroom*. Newtown, N. S. W.: Primary English Teaching Association.
- Dunn, J. (2004). *Children's friendships*. Oxford: Blackwell Publishing.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality and development*. Hove, East Sussex: Psychology Press.
- Eagleton, M. & Hamilton, M. (2001). 'New genres in literacy: classroom webzine projects'. At <http://hrast.pef.uni-lj.si/~joze/podiplomci/FRI/MV27EFHT.HTM>, accessed 14.12.2012.
- Ertem, I.S. (2010). 'The effect of electronic storybooks on struggling fourth graders reading comprehension.' *The Turkish Online Journal of Educational Technology*, 8/4: 140-155.
- Fisher, R. (1990). *Teaching children to think*. Oxford: Basil Blackwell.
- Gardner, H. (1993). *Multiple intelligences: the theory in practice*. New York: Basic Books.
- Glasgow, J. (1996-1997). 'It's my turn! Part II: Motivating young readers using CD-ROM storybooks.' *Learning and leading with technology*, 24: 18-22.
- Healey, D. (2007). 'Autonomy in language learning.' In E. Hanson-Smith & J. Egbert (Eds.), *CALL Environments: Research, practice and critical issues* (2nd ed.). Alexandria, VA: TESOL.
- Hofstetter, F. T. (1997). *Multimedia literacy*, (2nd ed.). Boston: McGraw-Hill, 1997.
- Hope, G. (2002). 'Solving problems: Young children exploring the rules of the game.' *The Curriculum Journal*, 13/3: 265-78.
- Katz, L., & Chard, S. (2000). *Engaging children's minds* (2<sup>nd</sup> ed.). Norwood, NJ: Ablex.
- Lambert, E. B. (2000). 'Problem-solving in the first years of school'. *Australian Journal of Early Childhood*, 25/3: 32-8.



- Lehrer, R., Erickson, J., & Connell, T. (1994). 'Learning by designing hypermedia documents.' In M. Reed, K. Burton, & M. Liu (Eds.), *Multimedia and megachange: New roles for educational computing*. New York, NY, Hawthorn Press.
- Leu, Jr., & Kinzer, C. K. (2000). 'The convergence of literacy instruction with networked technologies for information and communication.' *Reading Research Quarterly*, 35/1: 108-127.
- Lloyd, B., & Howe, N. (2003). 'Solitary play and convergent and divergent thinking skills in preschool children.' *Early Childhood Research Quarterly*, 18/1: 22-41.
- Lorien, J. S., & Lorien, A. (2001). 'Story and more: Virtual narratives for electronic times'. At <http://ac-journal.org/journal/vol1/Iss2/editorials/nelsons/nelsons.htm>, accessed 14.12.2012.
- Loschky, L. (1994). 'Comprehensible input and second language acquisition: What's the relationship?' *Studies in Second Language Acquisition*, 16/3: 303-323.
- Matthew, K. (1996). 'The impact of CD ROM storybooks on children's reading comprehension and reading attitude.' *Journal of Educational Multimedia and Hypermedia*, 5/3: 379-394.
- Matthews, J. (2003). *Drawing and painting: Children and visual representation*. London: Paul Chapman Publishing.
- McNaughton, G. (2003). *Shaping early childhood*. Maidenhead: OUP.
- Medina, J. (2009). *Brain rules: 12 principles for surviving and thriving at work, home and school*. Seattle, USA: Pear Press.
- Mills, D. (2000). 'Web-based technology as a resource for form-focused language learning.' *TESOL Quarterly*, 34/3: 603-615.
- Mohan, B. (1992). 'Models of the role of the computer in second language development.' In M. Pennington, & V. Stevens (Eds.), *Computers in applied linguistics: An international perspective* (pp.110-126). Clevedon, England: Multilingual Matters.
- Papaleontiou-Louca, E. (2003). 'The concept and instruction of metacognition', *Teacher Development*, 7/1: 9-30.
- Piaget, J. (1967). *Six psychological studies*. New York: Random House.
- Pimienta, D. (2002). 'Digital divide, social divide, paradigmatic divide'. Accessed at [http://www.info.fundp.ac.be/~jbl/IFIP/NA2008\\_Lecture\\_Paradigmatic\\_Divide.pdf](http://www.info.fundp.ac.be/~jbl/IFIP/NA2008_Lecture_Paradigmatic_Divide.pdf), on 14.12.2012.
- Prentice, R. (1994). 'Experiential learning in play and art.' In J. Moyles (Ed.), *The excellence of play*. Oxford: Oxford University Press, pp. 125-35.
- Project Zero & Reggio Children (2001). *Making learning visible: Children as individual and group learners*. Reggio Emilia, Italy: Reggio Children.
- Richards, J., & Rodgers, T. (2001). *Approaches and methods in language teaching*. (2<sup>nd</sup> ed.). Cambridge: Cambridge University Press.
- Robson, S., & Hargreaves, D.J. (2005). 'What do early childhood practitioners think about young children's thinking?' *European Early Childhood Education Research Journal*, 13/1: 81-96.
- Siraj-Blatchford, I., Sylva, K., Muttock, S., Gilden, R., & Bell, D. (2002). *Researching effective pedagogy in the early years*. Research Report 356. London: DfES.
- Skinner, B. F. (1968). *The technology of teaching*. New York, Appleton-Century-Crofts.
- Smith, P. K., Cowie, H., & Blades, M. (2003). *Understanding children's development*, (2<sup>nd</sup> ed.). Oxford: Blackwell.
- Veenema, S. (2001). 'Multimedia and multiple intelligences'. *The American Prospect*, 29: 69-75, at <http://prospect.org/article/multimedia-and-multiple-intelligences>, accessed 14.12.2012.

- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Warschauer, M. (2000). 'The changing global economy and the future of English teaching.' *TESOL Quarterly*, 34/3: 511-535.
- Whitebread, D., Anderson, H., Cotlman, P., Page, C., Pasternak, D. P., & Mehta, S. (2005). 'Developing independent learning in the early years.' *Education 3-13*, 33/1: 40-50.
- Wood, D. (1998). *How children think and learn* (2<sup>nd</sup> ed.). Oxford: Blackwell.
- Wood, D., Bruner, J., & Ross, G. (1976). 'The role of tutoring in problem solving.' *Journal of Child Psychology and Psychiatry*, 17/2: 89-100.
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## Appendix I

### Quantitative research materials

#### Multiple intelligences' dataset and its fourteen variables

Multiple Intelligences (MIs)

(circle one out of four)

(1=not at all, 2=not much, 3=enough, 4=a lot)

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*Do you believe that learning English through e-books finally helped you to...*

1. drag the mouse by doing a right or left click, open and close documents, create folders, use toolbar, copy, paste and delete texts?	1	2	3	4
2. spot and observe pictures and images and link them with new vocabulary expressions?	1	2	3	4
3. color and draw by clicking on icons?	1	2	3	4
4. read, watch and listen an English e-book?	1	2	3	4
5. fill the speech bubbles from an e-book scene using the Word?	1	2	3	4
6. learn vocabulary and grammar through games, puzzles, crosswords?	1	2	3	4
7. enrich your knowledge and opinion sharing with your team members?	1	2	3	4
8. cooperate in order to perform a short theatrical scene?	1	2	3	4
9. learn through your teacher's and team's feedback?	1	2	3	4
10. concentrate and think more when it is your turn to do an activity?	1	2	3	4
11. improvise when you take the floor to speak or perform a short theatrical play?	1	2	3	4
12. write a poem, compose an accompanying melody and sing it along with your team members?	1	2	3	4
13. be more decisive and ready to make your choices ? (when you decide upon which way to go...)	1	2	3	4
14. feel very satisfied and happy from your scores and performance on e-books' activities?	1	2	3	4

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## Appendix II

### A. ONLINE LITERARY FEATURES

Students had to...

1. Read the instructions in English to gather information about their next move.
2. Find the right adverb, adjective, phrasal verb or noun to move the story forward. For instance, the three heroes of the story (Digger and the gang) had to 'keep their head down' and students had to click on the right option among four choices offered (find a synonym of this phrase).
3. Choose their favorite comic story and make their own comic strips by typing their own text inside the bubbles.
4. Decode images to letters based on a secret code book and form correct sentences.
5. Print their own story versions and see the results of their actual writing.
6. Take the role of journalist and write a short report of the story on a word document. Students formed one or two sentences for each story scene.
7. Correct the spelling and syntax based on software learning tools (ex. Babylon, Ginger it!). These online dictionaries and grammar checkers created correct sentences based on students' spelling, grammatical and syntax mistakes.
8. Click on the right words (adjectives, nouns) in the gaps to form a little poem.
9. Writing captions under their drawings (using word art) to describe them.

### B. PUPILS' INTERVIEW EXTRACTS

"I chose to go back and forth the story telling...sometimes we had to go back in order to find a clue we could not remember...this helped us find the right way out...to take the situation under control..."

"I had to move –the story – towards the end because I had not much time left..."

"I could not write the whole story and I had to omit certain scenes..."

"I had to rely most on video and computer's help options because I couldn't understand much of the sound..." (choosing their own way)

"I could cooperate very well with my classmates...I sat next to 'strong' students to listen to what they were saying in English...giving the floor for us to speak...using phrases such as 'what about trying to...let's do ...what do you think...is it a good idea to...do you agree?'" (verbal transactions)

"We cooperated together... and we could talk as a team to move the story forward..."

"Great!!Now we're gonna surf on the net and be lucky enough to 'get into' the site I told you about...nice and easy!" (pupils' readiness)

"I did everything on my own because I am too smart...!"

"I know how to use a computer, so I did not have to ask anyone..."

"I mostly helped my classmates but I also got their help in some difficult points..." (self-esteem and self-efficacy)