THE INTRODUCTION OF *IT* IN THE LIVES OF CHILDREN AS A SERVICE TO GLOBAL PEACE: EXPERIENCES FROM A NATION-WIDE EXPERIMENT 15 YEARS AFTER

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Abstract

In 1992, we launched a nation-wide experiment based on a concept we then called the "*profitable dream.*" We envisioned that introducing advanced computer technology in the lives of a critical number of young children using an educationally relevant and socially responsible, peace-enhancing curriculum would allow us to "transcend" the country's educational and political life and move the new generation a decade ahead. The project was founded on a well-defined vision statement: "… *to re-define the tools, methods and purpose of education, in light of relevant social change.*" The vehicle chosen to disseminate the impact of the project and its vision was the profit-making concept of franchising. Within the first five years (1992-1997) 26 computer-learning centers were launched with average of 50-150 students enrolled in each location. By 1999, the number of children who benefited from the Cyber Kids curriculum exceeded 15,000, which is approximately equal to 20% of the country's youth population (ages 6-15). During the same period, the organization trained and employed 186 young and talented university graduates, thus combating brain drain while simultaneously spreading the Cyber Kids philosophy and knowledge to many more spheres of social life. This paper attempts, fifteen years later, a critical examination of the project, and an evaluation of whether the experience gained in employing IT in connection with innovative education can serve to bridge the digital divide in terms of high-tech literacy and economic development contributing to the world's top priority, fostering and strengthening a global culture of peace. A brief overview of the award winning cyber method is also provided.

Keywords: computer education, pedagogy, curriculum, constructivism, leadership, user-centered, social entrepreneur, "agent of change", vision, peace, development, transformation, literacy-, economic- and digital divide.

Introduction

In 1990, we embarked upon an ambitious visionary project aimed to transform education and technological infrastructures on the ethnically separated island of Cyprus; a small country with less than one million citizens. Our motivation stemmed on one hand from the concession that educational systems all over the world seemed to be failing to meet contemporary needs and expectations, and on the other hand, from the advent of promising computer-based technologies which were signaling fundamental changes in social development and human evolution. The aim of the project was to test the hypothesis that by acquainting the young with the most up-to-date tools and knowledge of tomorrow's world, we could accelerate social transformation and better prepare future citizens for the emerging competitive world in terms of a culture of global peace, tolerance and creative cooperation.

The first author (at the time a Research Assistant Professor) together with a committed (at the time, graduate student) friend, both at the University of Arizona, came up with the plan to test the above hypothesis in their homeland. They envisioned that introducing advanced computer technology into the lives of a critical number of young children, using an educationally relevant and socially responsible curriculum, would allow them to "transcend" the socio-cultural and political limitations of their country and move their society forward a decade. The project was driven by a few concrete and

powerful philosophical principles, which served as the inspiration and the glue to build a team of committed agents of change and entrepreneurs. The concept of the "profitable dream" attracted highly educated and extremely talented social entrepreneurs, who formed the core group, then called a *high-performance group*. The philosophical and political foundation of this effort incorporated the idea that "heroes" of the next millennium need not be defined by adversarial nationalisms and deadly conflict with others around the world. Rather, the new concept proposed the creation of a social-economic and educational space within which IT-based education would open up opportunities for humanistic oriented learning, fostering mutual understanding, cooperation and reaching out to the rest of the world, while at the same time having the right and the opportunity to participate in a "profitable" business venture.

The vision statement "… to re-define the tools, methods and purpose of education, in light of relevant social change" proved to be a very powerful one. It illustrated and explained the various facets of the accompanying curriculum, philosophy and pedagogy of the Cyber Kids project. Every word in this vision statement carried significant, well thought out meanings with profound implications. The term *re-define* revealed a revolutionary disposition. From a dialectic point of view, it implied that the conventional educational systems required exhaustive upgrading and transformation to meet the needs and challenges of the new millennium. It needed to be completely re-visited and re-defined. The term *tools,* referred to and called for the need to integrate emerging technologies into the educational context. For the 1990's, *tools* referred to computers and the Internet. Today, it would also refer to mobile devices and associated services. The term *methods*, highlighted the urgent need for new methodologies, new pedagogies and new theories to guide learning activities. The term *purpose*, disclosed the requirement to question the very purpose of conventional education, and to open up discussion and inquiry as to why and for what end children should spend half their lives in schools. It further denoted the exploration and development of novel approaches to learning and acquisition of new knowledge in light of globalizing conditions and the consequent need for a global culture of peace and cooperative symbiosis. The central concept of the vision statement envisioned a society in which people not only engage in learning activities voluntarily and with enthusiasm, but also with high respect for knowledge, wisdom and human values relevant for global co-existence. Finally, the phrase *"... in light of relevant social change,"* suggested that the above vision, stated within the context of a dynamically changing world, will be ever changing to accommodate evolving needs.

The Cyber Kids Method

Initial investment and foundations

The founders of the project did not have any financial strength, as the families of both became refugees in 1974, following the Turkish invasion in Cyprus. The initial funds mainly came from the following sources: (a) $ 5,000 from the International Program Development Fund and from a Provost Teaching Award of the University of Arizona (awarded to the first author), (b) $ 20,000 from the third member of the team, Maria Symeonides, who quit her job at Apple Cupertino to join the dream from the very beginning; (c) $ 80,000 in the form of a "low-interest" (as it turned out later, the compound interest and repayment conditions were similar to those of any bank) government loan for the unemployed; (d) $ 10,000 in the form of a bank overdraft which required as securities five guarantors and a 250 sqm plot (value over $ 50,000), which was the only asset of the sister of one of the team members; (e) never-returned loans by the father, Chris and wife Joulietta of the first author who still remain firm believers of the power that early education has to change the future world of children. These details are provided not to obstruct, but to inspire and enhearten potential social entrepreneurs to dare to follow their dreams even with modest resources available.

Launching

The project was launched in three cities simultaneously. Almost all the money was used to purchase 28 Apple LC computers, a few high-power computers for the management team, printers, scanners and

software. The furniture, air-conditioning and other appliances were purchased a year later through leasing. In the Headquarters Office, the furniture was "virtual," i.e., chalk drawings on the floor along with cushions (an innovation that added to enthusiasm and self-esteem). The absence of an adequate business plan in connection with the unprecedented determination for success did not leave space for putting money aside to pay employees their salaries for a few months. (Note: The unconditional sacrifices in the name of the dream had a detrimental effect on enthusiasm and gradually lead to fatigue).

Legal framework and expansion strategy
We used the concept of franchising to accelerate expansion and to counter-balance the reality of not having our own adequate funds. At the time, Cyprus was ethnically divided and characterized by a closed and protected economy. As franchising was unknown, there was no adequate legal framework for the concept of franchising, nor for securing trade names, patents and copyrights. For example, although Cyber Kids invested considerably in fees paid to the Company Registrar and to top attorneys to secure trademarks, including the accompanying terms (e.g., cyber kids, -teens, -minors, cyber camps, -radio, -institutes, -café, -network, -advertising, -centers, etc.), the Registrar shamelessly approved the trade name "cybernet" for a group of Cyber Kids franchisees who did not wish to pay their royalties any longer. The action of the Registrar thus furnished the breakaway franchisees with the necessary "legal" grounds to appropriate not only Cyber Kids intellectual assets, but also physical ones, as was the case when they added stickers with the term "net" to cover the term "kids" on the Cyber Kids trademark, thus utilizing stolen posters, signs, banners, etc. Only a few years later, when the US forcefully demanded all countries to sign the international treaty for the protection of intellectual property and when Cyprus adopted the relevant EU regulations, could such matters theoretically be sorted out in courts. Of course, for Cyber Kids, it was already too late and the above anomaly cost the company close to one million dollars. Despite the absolute absence of legal protection from the government (indeed the official government may be among the enemies of the project; see discussion), Cyber Kids managed to expand very quickly and very successfully. To make its visions and its project known to the wider public, Cyber Kids applied what was then called *total marketing*. This involved the printing of 100,000 leaflets every summer, distributing them in a country of 600,000 living in the free zone of the Greek Cypriot south. This approach translated into one leaflet per household, delivered from door-to-door, irrespective of whether Cyber Kids could serve every region. In addition, it placed about one hundred, 4-meter long, banners at all major road crossings every summer before the beginning of the school year. The aim of this campaign was to communicate our ideas and intentions to people and to attract franchisees. Not surprisingly, nearly all newspapers and magazines and many radio and TV stations dedicated wide coverage of Cyber Kids ideas and our successes (links to be available on line under *www.cyber-kids.org*), thus adding to the legitimization and appreciation of our work. The resulting expansion was almost exponential.

Training the trainers
Training constitutes the cornerstone of initiating and sustaining the expansion of Cyber Kids whether at the branch or on a national level. The function of training is to prepare the personnel of any new center to assimilate and put into effective action the Cyber Kids philosophy and practice, by becoming versed in the various aspects of its operation, ranging from developing an appreciation and understanding of the core values of the philosophy, to teaching methodologies and pedagogical approaches, to management and marketing. Training also aims to equip the new member of the Cyber Kids community with all the tools, knowledge and aspiration to serve as an agent of social change.

Research & Development at CNTI
The Cyber Kids success is based on continuous R&D performed in collaboration with the Cyprus Neuroscience & Technology Institute. This arrangement enables the organization to attract an additional number of young scientists who offer their services in scientific skills and activities in exchange for an exciting visions for positive change, the joy of research, participation in conferences and scientific publications and the accumulation of experience that supports their regular career.

Cyber Kids philosophy and curriculum manuals
The Cyber Kids philosophy is the heart and soul of Cyber Kids and its description extends over hundreds of pages. Following the decision of the company to make these ideas and methodologies available to the wider public, the authors are committed to gradually releasing them in the form of scientific publications; a process that has already begun (for examples see references). The philosophy and pedagogy are applied to support a 6-year long curriculum. Parts of these ideas will be made available in the public zone of the *www.cyber-kids.com* web site early next year.

Since the actual details of the philosophy and curriculum are extensive and proprietary, we describe briefly in the following paragraphs some of the key elements of the theory, to serve as an initial resource for those social entrepreneurs who might wish to apply the concept in their countries (Note: The authors invite interested parties to contact them. They will be delighted to support those who share the dream).

Classroom organization. At the time of launching, most schools universally adopted the hierarchical model of classroom organization, i.e., all chairs facing the teacher and the blackboard. We chose to place working spaces close to the walls with computer monitors facing towards the center of the room. (Note: Our innovation hit against walls of government bureaucracy as most of our centers were not granted, by the Ministry of Education, permission to operate because the windows, blackboard and chairs were *not* in the right places!). This organization allows students to move freely (stretching their muscles), collaborate in front of each other's monitor, or to quickly re-arrange their sitting arrangement turning their rotate-able chairs inwards to engage in ad-hoc conversations. It furthermore allows the teacher to easily track how each student is progressing by enabling visual access to all students' monitors without disturbing them (since they have their backs turned to him/her!). We provide students with personal mailboxes to store their works, receive materials from their instructors or drop tasks to their peers. We also give them access to a plethora of additional equipment such as printers, scanners, audio editing, digital cameras and TV monitors. Advanced students were given permission to use the most sophisticated computers.

KnowledgePacket[®]. The core recipe for the development of all our lessons is based on a proprietary concept we named KnowledgePacket[®]. The innovation of our approach (which was honored by 7 international awards) lies in the way we manage to intermingle curricula with incompatible structure and goals to produce a developmentally ordered and well-structured curriculum, which is completely learner-centered and project-oriented. The concept of the KnowledgePacket[®] is applied to each lesson (i.e., project) and extends the value of the learning activity by combining within one and the same project the following attributes: (a) Educational theme and value; (b) Mental and psycho-emotional development; (c) Computer skills; (d) Social awareness and linking to real-life and society; (e) Detailed instructions to teacher; (f) Proposed software. The KnowledgePacket[®] can be viewed today as a predecessor of Learning Objects (LOs). Indeed our recent contributions in the global efforts for standardization of LOs are using concepts from the original KnowledgePacket[®] in an attempt to add to the educational, mental and social dimensions in the LO standards (Laouris, 2005 a,b).

Philosophy adapted to age and prior experiences. The curriculum philosophy comes in different versions and variations depending on age, prior knowledge, special needs and culture of the recipients. For the first levels (Minors A & B, children under 9) the emphasis is in the development of their psycho-emotional world and selected mental abilities as well as development of passion and love toward exploring the world of knowledge and technology. The next two levels (Juniors A & B) focus on the development of problem solving skills and acquisition of advanced technical expertise. The Seniors levels aim at talent exploration and working in teams on complex real-world projects that require exploitation of their acquired communication and negotiation skills. The Cyber Kids philosophy utilizes a new definition of the learning mind; one, which aspires to

identify, assess, monitor and develop mental abilities (we call them mental attributes) that are important for learning. The authors are engaged extensively in related research and have developed a framework to describe the learning brain using this concept and apply it in a computerized system that assesses a number of mental attributes (Laouris, 2003, 2005). The system was recently validated in 30 schools and proved very useful for the screening and diagnosis of learning disabilities.

Student-centered, role reversal, shifting control. All projects follow the principle that *control* is not with the instructor, but with the student and his/her peers (whose role is both to encourage and to monitor). This shift of control is achieved through a process of role reversal by which the responsibility to choose, design and implement a project is passed to the students. This applies to both assuming initiative to perform an activity and exploring knowledge bases to discover and acquire the know-how and skills necessary to fulfill self-defined tasks.

The "God gave you 5 min" teaching method. The method capitalizes on whole-life experiences of an instructor, who is asked to imagine that God gave him/her 5 minutes to offer an animated and vivid explanation of a concept or a process to a group of students in a way they will understand and remember it forever. Transcending into such hypothetical scenarios reconciles one's relations to the extraordinary and the world of the "impossible" thus stimulating creativity and imagination (Laouris, 2006, in preparation; draft available).

Project-oriented; Creators, not consumers. All educational activities are project-oriented. This means that whatever the educational theme we wish to teach, the mental attributes we aspire to develop, the computer skills we plan to drill, the social relevance we assume to convey, children will go through a process of defining their own project (or team project for senior levels), planning its implementation and successfully delivering (i.e., publishing, printing, presenting to the group, etc.) their product. There is an incredible amount of theory behind these concepts, but for the purpose of this paper let us restrain ourselves to discussing: (a) the importance of cultivating the attitude of a creator rather than a passive user or one who follows instructions and (b) the power of becoming accustomed to delivering a final product within an agreed deadline and in compliance to promised specifications.

Development of communication-, negotiation- and leadership skills along with social values and ethics. A very important facet of the Cyber Kids curriculum is its focus on the development of personal values, qualities and skills. Embedded within the instructions of lesson plans that address the needs of team projects, are instructions on how to stimulate discussion, encourage debates, negotiate the differences and finally, to reach a consensus that will allow them to collaborate and complete their project. Usually leadership emerges out of such small working groups and it is the role of the facilitator to nurture and guide students to develop in healthy and ethical ways. During this process the instructor is also trained to bring-up and offer for discussion issues that relate to human values.

The extracurricular dimension. Schooling is a rather recent invention of our world and has served the needs and constrains of its times. Building on our prediction that, in the next 20-30 years, education will incrementally be moving out of classrooms, we included in our educational scheme a strong extracurricular dimension. There is a distinctive difference between formal classroom education and education that takes place in a context and is situated in a relevant environment. The first paradigm provides the learner with a third-person perspective, i.e., s/he "sees" the world and is expected to extract knowledge and derive wisdom through the eyes of others. Taking students out of the classroom and placing them in context allows them to "see" the world with their own eyes and develop their own point of view. Having with them recording instruments (i.e., digital cameras, scanners, voice- and sound recorders, etc.) provides them with additional possibilities, which go far beyond what a superficial understanding of extracurricular activities denotes. It

equips them with "eyes" which can "see" the world from different perspectives. Imagine, for example, how the world (in philosophy and cognitive science we borrow the term *Umwelt* from the German) would look like if we could experience it from the perspective of a dog. Each one of us lives in our own environment and develops our own understanding of the world. This is due to biological, cognitive and cultural constrains. Technology provides the *transducers* (i.e., machines which can record signals from the world that the normal human cannot; e.g., zooming capability) that not only can break such constrains, but when working in teams and within a context contributes towards constructing a joined cognitive and mutually acceptable model of the world. Learning becomes more experiential, and thus constructivist, and less bound to the classroom. One could almost compare it to an adventure game experience. The plethora of activities envisioned and implemented serves our aim for a socially responsible education.

Below is a summary of such activities, in which the contribution towards students' development is briefly highlighted.

- *Links to the world of professions.* Senior groups have scheduled and planned visits to professional environments such as publishing houses, research institutions, business and accounting enterprises, etc. This enables them to interact with professionals, as well as, correct possible misconceptions, reflect on their own interests and talents, exercise their communication skills and train their ability to extract the information they wish and use it for their projects.

- *Students as creators of advanced multimedia projects.* In almost all cases, out-of-class endeavors are combined with the development of some project (mostly multimedia-based) related to the needs and operations of the place we visit. More often than not, student' projects reach levels beyond excellence. For example, students have developed complete programs for kiosks, hotels, video stores, etc. Following a competition among our most talented children in graphics design in 1996, we even adopted a more lively, colorful and technically manageable logo (see it on the web site) revised by one of our students.

- *Engaging them in research.* Within the framework of special agreements, our students collaborate in research activities and perform joint presentations with college students as well as complete internships and apprenticeships at CNTI and other research and/or academic institutions. This acquaints them with attitudes, styles and working habits of forward thinking people. It also familiarizes them with the world of science and research, thus removing some of the stereotypes and misconceptions that many people have about such communities.

- *Presenting their innovative ideas in public forum.* In many cases, students are encouraged to come up with innovative ideas and inventions and present them in national or international competitions (such as the Innovation-Technology-Social Progress,). The brainstorming sessions preceding the process and the activities towards documenting an idea and preparing it for presentation stimulates their creativity and develops their problem-solving skills. The actual participation in a forum in which adults and representatives from the authorities, the industry and financial bodies dominate, boosts their self-esteem and confidence. (visit www.cnti.org.cy/CNTI_Album/1993/1993_KTK_A/index.html for information).

- *Camping, sport, museums visits, exploration expeditions.* A few times a year mass events are organized, in which students from different centers in different geographical locations participate. During these events, teams work on well-specified projects that involve data collection (recordings, video-taping, interviews, data collection through questionnaires etc.) and subsequent development of multimedia projects. What is important in these activities is that the *lab* (i.e., tools such as computers, cameras, recorders, note books, etc.,) goes with the students. This contributes enormously, not only towards situated learning, but also towards preparing the citizens of tomorrow to expect technology to be able to accompany them wherever they wish to go, rather than having to visit specific and geographically fixed places in order to use it.

- *Contributions in art and culture.* At least once a year almost all students are encouraged to submit artistic creations to art competitions and exhibitions. For examples visit: www.cyber-kids.com/album/art. Such endeavours cultivate not only creativity, but also understanding and appreciation of the value of art and culture.

- *Interacting with video games.* Not only at the completion of their projects during each session, but also at any other time of the week they wish, students may use the center's computers to try-out and play video games. The games are chosen by the researchers to comply with certain standards. Usually students are requested to participate in small research projects which expect them to evaluate the games for various characteristics such as degree of interactivity, fun, engagement, educational value, skills that it trains, etc. By doing so, students develop a critical perspective and relationship toward video games while also drilling certain skills. The concept is that students who have been attending classes for more than a year are attracted much less to video games, which demand low cognitive effort.

- *Participation in leadership, conflict resolution and communication skills workshops.* In collaboration with peace groups and other civil society organizations, students participate in workshops offered for young people, which aim to develop their skills in communication, negotiation, leadership and conflict resolution. Such skills are applied and sharpened during the implementation phases of their team projects, as they negotiate the division of labour among themselves, debate on the specifics of their joint project, and collaborate to present it to their peers and compete for excellence.

- *Social voluntary work.* Shortly before Christmas or in parallel to national fund-raising campaigns for children with special needs, our students are encouraged to come up with ideas and a plan of action to support other children who might be at a disadvantage. Their active participation and contribution to such events develops their social responsibility and deepens their ethical values.

In summary, our extracurricular (doesn't the term appear out of place after this discussion?) dimension contributes to a procedure that takes knowledge we own and understand and converts it into wisdom through a process of interaction with the real world, analysis and synthesis of concepts, growth of expertise and practical application in context. After all, according to Gisela Labourie Vief, "wisdom is one's ability to see beyond individual uniqueness into structures that relate us in our common humanity," or as Robert Sterberg wrote, "it is a virtue which provides us a compelling guide to action." (Citations borrowed from an inspiring presentation by Traxtler, 2005).

Results

Expansion data
The number of operating learning centers, entrepreneurs collaborating with Cyber Kids, instructors employed and students attending the Cyber Kids curriculum is summarized in Fig. 1 (see Legend for details). Note that the actual market and community penetration of the project might be more extensive than the largest number displayed for the last year might suggest, because a Center may operate for a few years and then close (i.e., it is not included in subsequent years), or students attending during one year do not necessarily attend during subsequent years. Also, what this graph does not show is the number of parents (grandparents and relatives in Cyprus are also engaged in family matters) who become sensitized, develop a knowledge about and appreciation for the method and evolve into active and passive supporters.
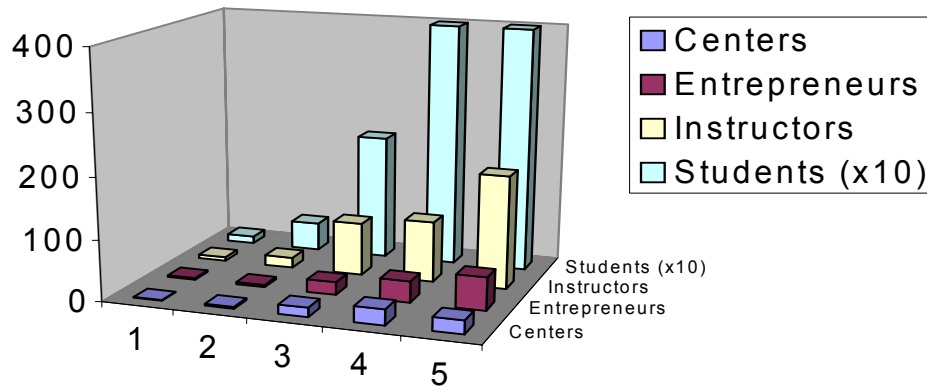
Expansion of Cyber Kids

Fig. 1 Expansion data of Cyber Kids in Cyprus. The x-axis plots the data for the first year of launching (1992), the year when the first franchised centers were launched (1993), 1995, 1997 and 1999. Note that the number of students was divided by 10 so that the rest of the data would not be masked. The actual numbers of centers was 1, 3, 5, 26 and 22. The number of entrepreneurs was, 3, 4, 21, 34 and 54. The number of instructors trained and employed (i.e., those trained but not employed are not included) was 6, 17, 87, 100 and 186. The number of students is plotted as a cumulative sum, i.e., the total number of students who have benefited from the Cyber Kids curriculum has exceeded 15,000 by 1999 (note that the numbers of the last two columns for students are out of scale; the actual numbers are 1997: 6,000 and 1999: 14,700).

Of course the numbers shown here might seem small. However, taking into account the size of the country in question (i.e. 600,000 citizens; 75,000 children in the age range 6-15), the implications for social change are quite real.

Training of Trainers
In the years between the launching and 1999, 186 young Cypriot scientists were trained to become instructors authorized to deliver the Cyber Kids curriculum. An additional number were partially trained but never employed. Also 37 multi-ethnic, highly qualified individuals of Lebanese, Greek, Israeli, Egyptian, Jordanian and Indian descent were trained to become the trainers of trainers, i.e., authorized to train new instructors. The training followed a curriculum that resembles that of a small university. It includes both theoretical and practical sessions. The theoretical part is composed of 46 short courses which cover areas like: (1) Courses introductory to Cyber Kids concepts, materials, methods etc; (2) Basic principles of business, financials and how these are applied in Cyber Kids operations; (3) Detailed training in the philosophy, method and delivery of the curriculum. This area includes courses in how to become a research associate and collaborate with the R&D of the Headquarters and/or how to become a curriculum contributor; (4) Scientific theoretical background such as the basics of various (mainly constructivist) learning theories, multisensorial approaches and multimedia, application of video-game technologies in the educational context etc.); (5) Special education courses focusing on how to deal with special needs children and when to refer them to experts; (6) Courses that illustrate the role of Cyber Kids toward social transformation as well as courses that bring the instructors up to date with the latest research findings and inventions in the IT and cognitive science fields; (7) A number of courses focusing on the specifics of the Cyber Kids Operation; (8) Special courses required for those involved with the international expansion. The practical training involves both mock sessions on all courses for which the potential instructor is expected to teach, as well as pre-agreed hours of training in real-class situation as an additional requirement for the final certification, under the supervision of experienced instructors. Potential instructors do not need to attend all classes and courses available. The head of education may offer

waivers depending on formal university qualifications, prior experience and required employment expertise. Not only are the numbers of young scientists trained impressive, moreover, the quality and type of education they receive contributes toward global change in the community in which we operate through a parallel path.

Research vehicle
In the years between 1992 – 1997, more than 30 students from the University of Cyprus, the Higher Technological Institute, Philips College, the Cyprus International Institute of Marketing and various international institutions performed practical training, internships, research projects and masters theses at Cyber Kids Headquarters. About an equal number of talented and advanced Cyber Kids students performed apprenticeships at analogous institutions as well as at selected medium size enterprises.

Contributing to global euphoria
The Cyber Kids evolved into an organization of thousands, if one counts also students and parents. This community of people shares an enthusiastic dream, has an appreciation for the value of education and their mind is turned towards the future. Their collective positivism adds to a culture of confidence and transmits a euphoria, which in turn contributes to the creation and amplification of a socially healthy momentum for change.

Relation to other organizations
Over the years, Cyber Kids has developed strong bonds and collaborations with many other organizations, such as NGOs for peace and other civil society groupings, the Dyslexia-, the ADHD- and the Autistic Children Associations, schools of special education and for the mentally retarded, etc. These relationships were built during the various extracurricular activities, i.e., for research purposes, as part of activities related to social/voluntary work or as part of special agreements to integrate children with special needs in our regular classes (see for example Laouris, et al. 1997).

Refocusing on real social priorities and values
The fact that Cyber Kids becomes an active social actor in the local communities assists towards re-focusing the interests of laymen by enriching everyday conversations with more important issues. The numerous events organized, media coverage, press releases, videoconferences, etc. facilitate the dissemination of the dream. They reinforce a change of the communal mental framework from an indifferent, partly corrupted society, which is mostly manipulated by its political leaders (in the case of Cyprus, the manipulation aims to keep the group interest focused on the *Cyprus Problem*) to a society that is more critical, and capable of ranking its priorities and goals.

Contribution to the national economy
The contribution to the economy of the country, and of course indirectly to global development, was one of the major goals when the project was originally launched. Fig. 2 compares the cumulative income from all centers with the cumulative income achieved by the Headquarters over the years 1992-1999.

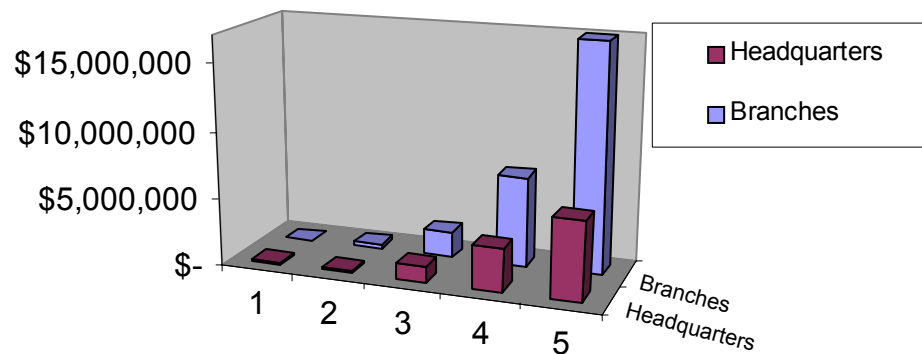**Cumulative income from Branches vs. Headquarters**

Fig. 2 Cumulative income for Cyber Kids in Cyprus. The x-axis plots the data for years of launching 1992, 1993, 1995, 1997 and 1999. The cumulative income for the Headquarter rises from about $100,000 during the first year of operation to over 5 million in 1999. In the same period the cumulative income from all franchises explodes to 17 million. At about 1995, the income accumulated by branches exceeds by far the income (and consequently the financial strength) of the Headquarters.

The Industrialist and Employers Association recognized the significant contribution to the Cyprus economy through the application of this most innovative approach by awarding Cyber Kids their most prestigious Prize in 1996. By that time Cyber Kids had already accumulated 5 international awards. During the ceremony, the person standing next to the President of the Republic who traditionally delivers the award, US Ambassador Richard Bautcher said "... we are glad Mr. President that Cyprus honors innovation and leadership the way we do." implying the support and recognition that Cyber Kids was already enjoying from international institutions.

Discussion

This paper reviews an innovative application of IT in a nation-wide experiment fifteen years after. Although it is generally accepted that the possible educational outcomes of new methodologies are very difficult to measure and evaluate, the authors propose that the experiment had a traceable impact for the reasons outlined in the next few paragraphs.

By recruiting and utilizing through its various activities, not only students, but also parents, instructors, social partners and the public at large, the experiment has initiated a nation-wide discussion and inquiry concerning the need for educational-, social-, and even political transforms. This thesis is not based only on the positive impact that the well-defined, -structured and – communicated vision, philosophy and pedagogical approach might have had. It is also based on the extent to which these ideas achieved to penetrate society. The results section has revealed that, percentage-wise, the number of children reached by the organization amounted to almost 20% of all children living on the island. What is not considered in the present paper are indirect contributions made via other learning centers, such as those that opened after being motivated through Cyber Kids' enthusiasm, impact and successes; as Cyber Kids break-away franchises; or as a natural development of the emerging IT era. Such centers, following Cyber Kids and benefiting from its leading role, not only in terms of opening the market, but moreover in being able to attract public attention, have in effect partially served the Cyber Kids dream. The number of instructors trained and employed by the organization might not seem large, but the fact that they were equipped with knowledge, skills and

clear vision converted them into powerful agents of change who operated within the society at large. The thousands of enthusiastic parents and grandparents may have supported their contributions.

Cyber Kids as an agent of change. Cyber Kids' research activities and scientific contributions, in special education and dyslexia in particular, have contributed to parallel developments in a wider context. For example, during the same years as Cyber Kids was initiating its research activities, the following developments took place: (1) Fulbright (which has always been a great supporter of Cyber Kids) provided more than a dozen short-term and year-long scholarships to teachers with interest in special education to study in the US. The majority of the recipients were public teachers, who were already collaborating, either as part-time instructors, or as research associates with Cyber Kids. Ten years later, these special educators, today hold sensitive positions in the public educational system. Even the head of the public special education department is the person in charge of the Cyber Kids' Dyslexia Group over the last 12 years. Together with his daughter, he is also owner of a successful Cyber Kids franchise. (2) The Cyprus Dyslexia Association (CDA) is founded months after the Cyber Kids' Dyslexia Group began its activities. The latter has organized more than 7 "Computers and Dyslexia" conferences, between 1993-2002, in which more than 200 educators, psychologists, speech therapists and IT specialists participate (proceedings available at www.cnti.org.cy). The Cyber Kids research group has collaborated with the CDA from the very beginning. Developed, IT-based research products, were validated in public schools partly under the supervision of the CDA. (3) Cyber Kids contributed enormously toward the establishment of the first citizens' peace movement in Cyprus, both with human resources as well as by providing meeting space, communication facilities and financial support (Anastasiou, 2002; Laouris, 2004). The authors were members of a core group of trainers[1], which introduced concepts of conflict resolution and peace to more than a few thousand people from both sides of the island[2]. The activities of the Cyprus peace movement gradually culminated in the drafting of the first comprehensive plan, known as the Annan Plan, for a sustainable solution of the long-standing Cyprus problem. The fact that the Cypriot (especially the Greek) society did not see the opportunity, and its political leadership did not embrace the initiative is a matter of greater debate and it is outside the scope of the present review.

Cyber Kids' educational paradigm. Cyber Kids has introduced not only a theoretically sound new educational paradigm, but also one that can be practically implemented even in hostile environments. It calls educators to move away from the stereotype that wants the teacher to be an all-knowing mystic individual who has all the answers. It encourages us to abandon once and for all the middle ages model of education, which is an implementation of the polymath, who wanders around in the countryside with his cart and carries with him tools that can solve all possible problems of contemporary civilization. With the explosion of knowledge, human technologies and constructions, as well as the widening of our interests' horizons, this becomes impossible. The new paradigm proposes shifting our mental framework to those models, which treat learning as knowledge and wisdom rather than as information. As T.S. Eliot said "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?" The proposed approach is a practical implementation of these theories, which has been tried out in the youth population of a whole country. Furthermore, it has introduced a number of new dimensions that have implications for the design of future educational environments. The KnowledgePacket® concept proposes, on one hand, new domains as an integral part of any educational project (i.e., educational and social relevance of what is taught, mental attributes of attempted child development), and on the other hand it lays out a new coding scheme, which can be of service in the design of LOs. A word about the role video games can play in mobile learning is probably also appropriate. Cyber Kids has been able to integrate them into the educational paradigm and its research has demonstrated that children can develop critical attitudes towards them. We lost valuable years to convince educators and bureaucrats that e-learning should not have declared war on the world of video games, but on the contrary it should have embraced them in their

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[1] http://www.cnti.org.cy/TFP_Album/HistoricDocuments/slides/TrainersLetterToUN.html
[2] http://www.cnti.org.cy/TFP_Album/Posters/slides/BicomHistoryMap97.html

pedagogical paradigms (Vakanas, et al. 1996, Laouris, 1998). Video games (and video game consoles) have secured their space in the lives of our children and are here to stay. We must begin studying these environments scientifically, embracing them within paradigms of mobile learning and taking advantage of their magnetism (Bonano, 2005). According to Kambouri (2003), our first goal might be to "… expand the usability dialog into the area of mobile educational games," thus highlighting and defining the differences between conventional game design and educational game design. We may then proceed to re-define usability criteria to fit our educational aims and goals.

Cyber Kids fosters economic development. The graphs in the results section demonstrate the contribution of the project towards economic development. What cannot not be derived, however, from graphs and analysis are indirect effects on the economy. Those include the extent to which the project has contributed to reversal of brain drain or the extent to which other young entrepreneurs were inspired and encouraged to follow their own dreams and aspirations and take risk by starting their own business, thus further contributing to economic development.

Cyber Kids strengths and weaknesses; supporters and enemies. Looking at the Cyber Kids project from a meta-position, one could conclude that it was not an easy project to implement in Cyprus. Not only the complete absence of an appropriate legal framework, but also many other factors and circumstances opposed its development and expansion. In an effort to highlight and possibly rank the few most negative experiences, obstacles and intractable parameters we would isolate the following: (1) Limited funds at launching. Although the project has succeeded to develop, expand and flourish, the fact that funds were limited at start-up chased its founders throughout, and influenced many important decisions. (2) Authorities count among the greatest enemies. Although, Cyber Kids seemed from the outset to be working and collaborating with top officials, ministries and financial bodies (such as the Development Bank which by becoming share holder mislead the company to detrimental and loss-making ventures), people in positions of power often treated the project antagonistically, and placed obstacles to its activities. (3) The status quo and the traditional economic powers in Cyprus saw the project as something disrupting the status quo and long-standing and -accepted hierarchies among people and organizations. The project was not only promoting ideas for educational and social transformation, but it was also introducing in Cyprus the new economy. (4) Cyber Kids has also encountered some of the most negative attitudes and characteristics of the Cypriot mentality, like those associated with a small size, closed society, the village mentality, arrogance, and a laziness combined with a tendency to steal and copy rather than to create, which they probably inherit from the Ottomans.

In summary, however, as the actual numbers demonstrate, the "supporters" by far outnumbered the "enemies." Furthermore, the mere fact that the supporters were very enthusiastic, driven by their hearts, were usually younger in biological and mental age and usually more educated, overwhelmed the "enemies" who were driven mainly by their own misconceptions, fears, conservatism and absence of vision and confidence. Cyber Kids students are now graduating from universities from all over the world and they will be the ones who are expected to put to work the concepts and principles learned. The spin offs of this experiment are multi-dimensional. We believe that the Cyber Kids concept has the potential to initiate and mobilize changes in many domains of life, in such a way that no formal institution or status quo can resist. We conclude this discussion with a word of encouragement and invitation to attempt to use this and/or similar models in the third world countries toward accelerating development, thus contributing to the closure of the literacy-, economic-, and digital divide.

became shareware. The revised mission inspires to make ideas, methodologies and experiences available to other people and countries. In this spirit we invite those interested to participate, collaborate and contribute in research activities, towards building bridges of communication and international scientific missions to contact us and explore possible collaborations.

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