

The Automation of Illiteracy Eradication and Economic Empowerment with Computer Based Learning: An Industry Revolution Perspective

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Abstract

For decades, Scientists, Researchers, Governments, United Nations organizations and people of good will have been conducting research, conducting experiments, implementing projects and reporting on as a developmental aspect that has one of the most negative impacts on right of human being. So what could be worse than illiteracy caging human beings in poverty and underdevelopment glass barrier that they are unable to break nor to proceed beyond in order to achieve their fullness as human beings free of poverty and capable of positive contribution to their societies and countries. So many efforts have been taken but they fall short of taking real advantage of Information and communication technology potential to speed up the process of liberation from illiteracy therefore bringing in positive change to the liberated in due time to move forward into better lives.

This paper introduces a software program called Ikraa with empirical experiences that have repeatedly demonstrated its impact in achieving illiteracy eradication in five working days duration. The latest project in Lebanon was capable of changing the lives of participating women from illiterates to becoming e-merchants practicing ecommerce to sell their handmade merchandise.

The paper demonstrates that if Ikraa is deployed at a massive scale then it is possible to achieve massive liberation from illiteracy in the Arab region in phenomenal time. It further sets the stage for ongoing research to customize Ikraa to serve similar purpose in other languages.

Keywords: Illiteracy, ICT, e-learning, computer based learning, Ikraa, empirical experiences, women, students

Introduction

Language illiteracy was being diagnosed by many United Nations organizations as a major impediment to development and economic prosperity by blocking illiterates to participate in the development processes and locking them in an underdevelopment generational vicious cycle. Further it has been diagnosed that in all regions of the world illiterate women constitute two thirds of the world wide population of illiterates that has been a real problem to eradicate literacy and thus poverty (Ananny, 2002; Benton & Thierry, 2001; Coleman, 2005; Durgunoglu, & Öney, 2000; Pontecorvo, & Zuccheromaglio, 1990; Rasool, 1999).

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Literacy on the other hand been considered by many organizations and in particular UNESCO as "a vehicle for eradicating poverty and improving participation in society. It is a vehicle to achieve the MDG goals and to empower poor in particular" ("Adult and youth literacy," 2010, Kies, Rodriguez, & Granato, 1993; Rasool, 1999). However, the advent of information and communication technologies offered a promising medium for illiteracy eradication and economic empowerment for all and for women in particular. The utilization of information and communication technology (ICT) in illiteracy eradication and improving education opportunities for all (Berman & Slobin, 1994; Browne & Barrett, 1991; Wagner, 1993) is manifested in ITU (United Nations Agency for Information and Communications Technology <http://www.itu.int>). Connected School project [<http://www.connectaschool.org>]. The Toolkit of Best Practices and Policy Approach (ITU Toolkit, n.d.; Toure, 2009) encompasses a list of worldwide case studies of the use of ICTs in development and illiteracy eradication suggesting several policy guidelines for decision makers and avenues of research into that area. The toolkit further manifests the high gender disparity in language and ICT literacy between men and women.

However, despite all awareness, the many efforts directed to liberate illiterates of the world from their illiteracy glass barriers and the wide spread use of Information and Communication technology and its applications, high percentage of women and youth at disadvantaged societies at large still suffer from the language and ICT illiteracy impediment that prevents them not only from improving their lives but also denies countries of considerable contribution to GDP at the macro economy level (Gleason, 2005; Hammersley, & Atkinson, 2007; Leahy & Yermish, 2003; Noe, 2010).

Considering Illiteracy of Arabic Language, It is assessed to be around 70 million 60% of which are women. There seem to have been efforts towards illiteracy eradication in the Arab region. Yet the progress is not sufficient and far from satisfactory. A recent declaration by UN commission stated that the Arab region progress is far from achieving the 2015 millennium developmental goals and in particular the goal of women empowerment and halving the number of poor and illiterates.

Our theory is that the means and approaches that were adopted for illiteracy eradication were not competent and not attractive to illiterates. These approaches employed classical non ICT based methodologies. Eradicating illiteracy (covering level one reading and writing skills) required at least 9 months causing drainage of illiterates from illiteracy classes. Few approaches utilized ICTs but they could shorten the learning period to 6 months instead of 9 which is still considered to be lengthy and inadequate if the objective is to make vital leap frogs in illiteracy eradication.

With the above in the background, and noting that digital literacy is not possible in the absence of language literacy, there need to be a competent tool and efficient approach for Language and ICT illiteracy eradication. Information and Communication Technology (ICT) provides a means for such a tool and approach.

Ikraa is computer Software for learning Reading and Writing Arabic Language. Ikraa prove unprecedented and distinguished efficacy in field implementations in Lebanon and Egypt in making its user learn Arabic language and acquire ICT skills in 5 working days only! Compared to the 9 to 12 months typically required periods for similar task.

Ikraa was awarded UNESCO creativity Award Recognition from UNESCO (Figures 1, 2, 3). It is among final-



Figure 1.

ists in the International Stockholm Challenge (Figure 4). It is endorsed in recommended policies and case studies for using ICTs in Learning by International Telecommunication Union (ITU), Adult Education Agency in Egypt (AEA), UNESCO Cairo Publications, Chairperson of Education Departments and Arabic Professors at Top Level Universities. (See Ikraa testimonials on www.learnaraby.com)



Figure 2



Figure 3

استخدام الحاسب الآلي في محو الأمية

يعد استخدام الكمبيوتر في محو الأمية تجربة رائدة بكل المقاييس، ففي الوقت الذي يكون هؤلاء الناس أسرى للأمية يحرقهم الكمبيوتر .

وفي هذا الإطار تقول مها البشير- المسئولة الإعلامية بجمعية حواء المستقبل: "إن التجربة الأولى كانت في لبنان من خلال برنامج قدمته إحدى الشركات الرائدة في هذا المجال، والتي قدمت البرنامج الذي نستخدمه في مصر، والذي يعتمد استخدامه على السمع في محو الأمية .

وتضيف : تم تجربة البرنامج على 10 سيدات في البداية، وكانت التجربة ناجحة بكل المقاييس . ونقول : " إن النجاح الذي حققناه دفع هيئة محو الأمية إلى إعادة البرنامج مرة أخرى، مشيرة إلى أنه من المتوقع أن يتم تعميم التجربة في مصر بأكملها .

وترى البشير أن الكمبيوتر كان بمثابة الدافع الكبير لأولئك الناس خصوصاً وأن أبناءهم الصغار كانوا يذهبون إلى مقاهي الإنترنت، في حين إنهم لا يعرفون شيئاً عن هذا العالم الغريب عليهم .



نحو رؤية إبداعية في تعليم الكبار في مصر 33



Figure 4

This paper gives an introduction to Ikraa Features and pedagogy approach, experiences in Lebanon, Egypt and KSA (Ikraa videos, n.d.) and its multiplier effect for illiteracy eradication if adopted at a large scale.

Ikraa

Ikraa is a computer Software for teaching reading and writing Arabic language using computers. Its efficacy as a tool for illiteracy eradication in developmental projects was proven in field experiences in Lebanon and Egypt. It was also experimented with and now used at schools in Lebanon for regular and non-regular students in supporting Arabic language literacy.

The objective of developing Ikraa is utilization of information and communication technologies to combat and speed up the tough task of learning reading and writing Arabic Language.

Ikraa is reached as result of extensive research of education pedagogy with the objective simplifying and speeding up the intricate task of learning Arabic language. The program introduces language in a systematic cumulative manner allowing learners to accumulate literacy reading and writing skills in an effective manner. It mainly adopts a multi-sensory (visual-auditory) approach and uses a combination of three pedagogy approaches: Explicit, Synthetic and analytical approaches. First: It adopts *Explicit* approach by introducing alphabets to learners. Learners learn the sound represented by an individual letter before they see it in a word. Second: It adopts *Synthetic* approach in teaching learners to combine the sounds to form a word. Third: The *Analytical* approach is adopted in Ikraa in the complimentary exercises section. This section is designed to maintain acquired reading and writing skills by learners. In this section students would analyze the words to deduce the letters or sentences to deduce the words.

Further, given the interactive nature of the program, most students will find it motivating to use, and can easily repeat parts of a lesson in case they didn't grasp it from the first time or need further drill and practice. Ikraa gives learner the opportunity to repeat and learn at their own ease thus illuminating the fear barrier of making mistakes and that discourages many from learning freely.

Technically, the development of Ikraa recognized the possibility of taking advantage of older computers to allow scaling its application by mass deployment in Computer labs. Therefore Ikraa was developed to work for older as well as for newer hardware technologies and on various operating systems with minimum Hardware requirements PIV chip technology or higher specifications.

Distinguished Attributes

In a Nutshell, empirically Ikraa

- *An innovative software (ICT) tool that adopts innovative approach and techniques for teaching Arabic language and using computers in a unprecedented time interval (35 hours).*
- Proven to aid school children in Learning Arabic Language which makes it an adequate tool for integration and streamlining of the use of technology in education

- Proven to be successfully used by both genders
- Proven to be successfully used by various student age groups and in various geographical locations.
- Evaluated on students with learning difficulties and was assessed to have potential in aiding students with learning difficulties in Learning Arabic Language.

Technical Features

Technically

- Ikraa is self-learning software that requires light mentoring and supervision
- Ikraa proved to be capable of ICT illiteracy training simultaneously with Arabic learning
- Ikraa utilizes audio and video technologies in teaching Arabic
- Ikraa displays lip movement making it easier for students to follow and learn efficiently
- Ikraa has a simple interface and relies on colors to ease use of computers and help learners who do not know the language to maneuver easily through various lessons
- Ikraa does not require advanced hardware specifications making it possible to deploy and make use of older computers.

Ikraa Content

Ikraa has an introduction to Arabic Language. Ikraa consists of 24 lessons that teaches Arabic language. Each lesson is complemented with exercises to enforce acquired reading and writing skills and to teach sentence composition. Learners would learn: Arabic letters with phonics characters; Reading and writing 1228 words; Connecting words to form sentences; More than 133 exercise related to sentence composition; Noun and Verb Sentences; Reading paragraphs; Connecting sentences to form paragraph

Recent versions of Ikraa include dictation sections that allow learners to drill on their acquired language skills.

Below are snapshots from Ikraa Software



The image displays four screenshots of the Ikraa software interface, which is designed for teaching Arabic to illiterate learners. The interface is in Arabic and includes several interactive exercises:

- Top Left Screenshot:** Shows a 'جمل' (Sentence) box with the text 'بَابُ بابا بَالِي لِي بَابُ لَيْبُ بابا لُولُو' and a 'كلمات' (Words) box with 'بَابُ', 'بابا', 'لَبُ', 'لَيْبُ', 'لِي', and 'بَلُ'.
- Top Right Screenshot:** Titled 'تمارين' (Exercises), it includes a section 'أضف الحرف المناسب لتكملة الكلمة' (Add the appropriate letter to complete the word) with four boxes for 'ب', 'ل', 'د', and 'و'. Below this is a section 'أجمع الأحرف وأختر الكلمة الصحيحة' (Combine the letters and choose the correct word) with options like 'ل + د + و + د' and 'ي + ل + ا + م'.
- Bottom Left Screenshot:** Titled 'تمارين' (Exercises), it includes a section 'أجمع الأحرف وأختر الكلمة الصحيحة' (Combine the letters and choose the correct word) with options like 'غ + ب + ا + ر' and 'غ + ص + ن'. Below this is a section 'رتب الكلمات التالية في جملة مفيدة' (Arrange the following words in a useful sentence) with words like 'الطير', 'على', 'الشجرة', 'غصن', and 'غرد'.
- Bottom Right Screenshot:** Titled 'للقراءة' (For reading), it shows a paragraph of text in Arabic, likely a story or a lesson, with a 'جمل' (Sentence) box above it containing the text 'أحبُّ أرضَ بلدي هَذِهِ مَسْأَلَةٌ ضَمِيرُ السَّلَامُ أَفْضَلُ مِنَ الْخَرْبِ لَيْسَتْ جِذَاءَ رِيَاضَةٍ مُرِيحٍ طَرِيقُ ضَمِيرَتْنَا ضَمِيرُ'.

Ikraa is currently used at 46 CENTERS IN LEBANON, two Centers in Egypt, Centers in KSA, private schools in Lebanon. Ikraa is being used by men and women, students of both genders of various age groups including kindergarten, including students with learning disorders. The Purpose of its Use is to aid in Learning Arabic language at Schools and for adult Learning and Illiteracy Eradication. Further it is available on www.learnaraby.com, in Arabic for Arabic speakers and with selected translations for English, French and other non-Arabic speakers wanting to learn Arabic language. Learners can register online and learn Arabic for a nominal fee to support Ikraa research and development.

Ikraa Experiences

Ikraa is a proprietary software of *.Technology sarl (www.technologysarl.com) that was contributed as an in kind contribution to all documented experiences below as part of social entrepreneurship activities of *.Technology sarl. All projects were executed by *.Technology sarl.

With the cooperation of UNESCO in and under the patronage of Dr. Ghinwa Jalloul (Former MP and Chair of Information Technology Parliamentary Committee, Lebanese Parliament) First project was launched in 2008 in 46 centers from all over Lebanon. It is still going in cooperation with NGOs for illiteracy eradication and for supporting reading and writing Arabic language skills for children. IN 2009 a pilot project was conducted in two NGOs in Egypt. In 2012 it has been launched in a Jeddah KSA. All experiences demonstrated that using Ikraa "the at least 9 month Arabic learning curve for liberating illiterates" the eradication of language and ICT illiteracy of participants was cut down in an unprecedented 35 working hours.

An advanced version of Ikraa application was executed by *.Technology sarl and funded by MEPI was done in 2011. It concluded on November 16th of same year. This project complemented illiteracy eradication with ICT and e-commerce training that resulted in liberating 63 participating women between 15 and 55 years old from illiteracy and equipping them with e-merchants entrepreneurial and ICT skills on the online mall www.soukorjuwan.com.

All projects involved: Ikraa Software deployment in computer labs at NGOs, public and private schools, Training illiteracy eradication teachers (the trainers) to become Ikraa MENTORS, Introducing participating illiterates to Ikraa Software and Computer Use, mentoring learners through a self learning process. Noting that train of the trainers occurred simultaneously while training illiterates therefore reducing training time overhead.



In Lebanon 2008

Ikraa was implemented in Lebanon in Spring of 2008. It was deployed in a total of 46 computers Labs including NGOs, Public School Labs. Labs were in various geographical locations: Beirut, North of Beirut, North and Biqaa Valley.

The pilot conducted repetitively over periods of one month per lab per experience, served to eradicate the illiteracy of 1500 women and men. Ikraa worked equally for groups of participating men that were also included in the project. Additionally the project included children from various age groups. Children were introduced to Ikraa and the experiments manifested outstanding impacts in aiding school children in acquiring Arabic language.

Learners Participants

- were 80% women, 20% men
- Came from various geographical locations from Lebanon
- Were in a wide range of age groups ranging between 13 and around 75 years old.

- All were able to use the software and to read and write efficiently in less than one month (35 hours)
- Ikraa was experimented with school children and proved to be a capable aid in teaching Arabic language therefore combating one of the reasons for new illiterates (school leavers that leave school because of difficulty in learning Arabic)

The Lebanese experience was rewarding and proved to be fruitful and compelling regarding the following aspects

- The efficacy of Ikraa in language and ICT eradication regardless of gender
- The efficacy of Ikraa in language and ICT eradication regardless of age
- The efficacy of Ikraa in speeding up the illiteracy eradication vertically by cutting down the 9 month learning period
- The efficacy of Ikraa in speeding up the illiteracy eradication and scaling horizontally by utilizing 46 labs simultaneously for different illiterate/learner groups
- Ikraa created a snow ball effect regarding the ICT Learners Skill development. Learners were able to build on acquired ICT skills, move on to using internet technologies efficiently including using Mobile phones, E-mail Communication, Internet browsing that opens avenue for lifelong learning. Some of the new learners have learned to trade online and consequently have now a new means for income generation that was not available earlier

Egypt Experience 2009

Ikraa was implemented in Egypt in January 2009 with the cooperation of UNESCO Office in Cairo and leadership of Dr. Ghinwa Jalloul¹. Two computer labs, each with 10 computers, were equipped with Ikraa and 20 women were trained for five working days (total of 35 training hours).

The result was far beyond expectations, the twenty participating and completely illiterate women learned how to use computers and they were capable of learning reading and writing Arabic language skills including writing small comprehension and dictation paragraphs

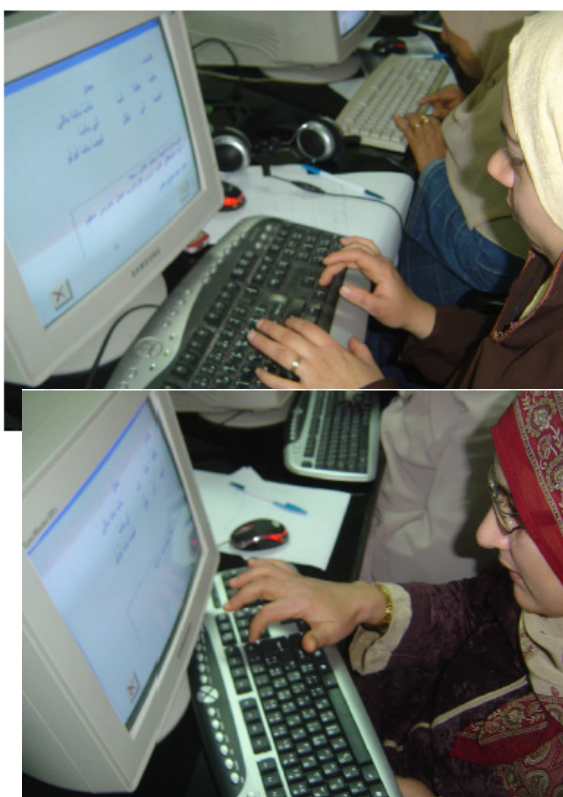
Learning about the noted successful experience, the Egyptian Adult Education Agency² (AEA) repeated the experiment with new 20 completely illiterate women. AEA achieved the same result, the 20 women learned to learn and write and to break the barrier with using computers. *Quoting from Dr. Raafat Radwan, the chair of AEA, then: "The use of the software proven to be successful. Learners and supervisors of the showcase highly rated the outcomes and recommended the use of the software in introducing learners to reading and writing"*.

*Former MP and Chair of Information Technology Parliamentary Committee, Lebanese Parliament*¹
Formal Authority in Charge of Illiteracy Eradication in Egypt²

Women in computer labs using Ikraa to learn Arabic



Reading, Typing and Writing under supervision of UNESCO Staff





Graduation Event under Patronage of UNESC -
Samples of comprehension paragraphs by participating learners



KSA- Jedda Experience 2009

Ikraa was piloted in one center in Jeddah with Majid Bin Abdul Aziz NGO. The program was applied for ten women participants who were liberated from illiteracy in 35 hours. Ikraa as a result was adopted for illiteracy eradication and a plan is underway to deploy to eradicate illiteracy in Jeddah.

From Illiteracy to Ecommerce 2011

Ikraa to work: Women economic empowerment with E-commerce (WEEE) (<http://www.technologysarl.com/WEEE.aspx>) supported by MEPI is the latest, yet the most effective project, in a sequence of projects to empower women with functional literacy. WEEE has three folds: Illiteracy eradication (language and ICT using Ikraa computer software) + ICT skill Training + E-commerce training with e-shop creation on www.soukorjuwan.com. WEEE was implemented in Al Minieh region with a local NGO. The first phase of the project is completed and 35 participating women have change into ICT skilled women with computer English skills and introduction to e-commerce concepts and techniques. The change is unbelievable, participat-

ing women gained capabilities to become e-merchants, and are asking for more skills for themselves, children and families.

WEEE was concluded in Nov. 2011. The target was 50 women but the popularity of the project made it conclude with 63 participants. The increase in number is attributed to the interest of participating women, their persistence to learn and ease in which they were moving through in various components of the training. Below are some pictures that demonstrates participating of women undergoing training and simultaneously minding their children.

WEEE is the first project of its kind to achieve Liberation of illiteracy and poverty plus economic empowerment using ICT training and internet technologies. WEEE project carries the maturity of years of experiences in women empowerment, human development, economic mobilization and democratic instigation and as such has readiness to be leveraged nationally for Lebanon and regionally as well.

Ikraa for Schools

Ikraa focuses on building up technical reading and writing skills and building commonly used language terms. This gives it the potential to streamline smoothly with school Arabic language curricula. Incidentally students would learn how to use and become familiar with computers as an education tool. Its capability to cut across age categories makes a candidate to support language literacy and consequently stop one source of illiteracy as a result of school dropout.

Student Categories

Student using Ikraa can be categorized as follows

- Regular students starting from kindergarten through to K7 classes
- The experiments proved that it would be a competent tool in supporting learning Arabic language and enforcing learned skills consistently with Arabic language School curricula. Several prime schools are starting to adopt it this year as a learning Arabic support.
- Special students that speaks language other than Arabic but understand Arabic language
 - Students with learning disorders



Ikraa is currently used following two methodologies

- a- Crash Course Approach: Target students would start their Arabic language training by using Ikraa. Once Acquired reading and writing skills they would move on to the

regular program where teacher could put focus on comprehension and analytical skills

- b- Lab Support Approach: Target students would take Ikraa training in parallel with their regular Arabic classes as a lab support to build, enhance and support their reading and writing skills

The Use of Ikraa in Schools Can Combat New Sources of Illiteracy

As becoming commonly known new illiterates are emerging and among the key reasons that were identified

- The difficulty of learning Arabic language that becomes a barrier preventing students from capturing and comprehending other material, eventually taking the choice of leaving school
- Illiterate Parents (and poor parents) that are incapable of helping their children to acquire education therefore they guide them to children work instead.



By using it as teaching support in Schools especially those of marginalized and disadvantaged groups

- Ikraa would be the Arabic language technology lab that would assist students in enforcing their reading and writing skills
- By eradicating the illiteracy of the parents, these parents would assist their children educationally. Illiteracy eradication would help to break the currently vicious under development cycle.

Ikraa experiences show the amenability of Ikraa TO ADDRESS LONG standing challenges in education.

Ikraa and the Automation of Illiteracy Eradication

Ikraa is an outstanding example of the Power of Information & Communication Technology and new Technologies at large in serving developmental needs. The magic of Ikraa is not that it teaches Arabic Language but its efficacy in achieving this objective and in introducing computers and computer skills to users.

Ikraa PROMISE IS ZERO ILLITERACY IN THE ARAB Region! Ikraa for illiteracy eradication could have the similar impact to the industrial revolution in terms of efficiency of mass production. "Ikraa automates illiteracy eradication and thus can massively eradicate illiteracy. In many respects it could be perceived of as the wheel of ICT revolution for development"

Technically the efficacy of Ikraa in speeding up illiteracy eradication gives it a multiplier effect and unprecedented potential in eradicating illiteracy in any designated time, given the availability of computer labs.

For instance, if the target is to get rid of illiteracy in 10 and assuming the 70 million published number of illiterates in the Arab Region and the availability of sufficient computer labs (which

are abundantly available in cities and villages in the Arab region) and that each lab has 10 computers and that it will be used 40 times (5 working days each week) per year to eradicate illiteracy of one group of 10 illiterates per lab. Then according to the following formula it would be possible to eradicate the illiteracy of the 70 million in 10 years or at least half the number in 5 years.

$$70,000,000 \text{ million} = 10 \text{ (illiterates)} * (40 \text{ weeks}) * 17,500 \text{ (labs)} * 10 \text{ (years)}$$

Noting that

- Only 17, 500 computer labs of 10 computers are needed and that Computer labs are abundantly available in Cities and villages in Arab Countries and the noted required number could be distributed proportionally based on no of illiterates in each country
- Ikraa is built to work on old and new hardware technologies so it is possible to benefit from computers and labs that are outdated and utilize these for the illiteracy eradication goals
- Using computers proved to motivate and encourage illiterates to participate
- The short learning period of 10 days reduces drainage of illiterates from labs to zero
- The 40 weeks time frame instead of a full year takes into consideration holidays and consequently is reasonable in terms of time assessment to reach the goal
- Availability of mentors won't be an obstacle because the current teachers would become Ikraa mentors. Only they would become more efficient

Conclusion

In conclusion through the utilization of computer based learning with Ikraa, a long sought cause that constitute a corner MDG which is education for all practically achievable at least for Arabic speakers.

Ikraa is undergoing continuous research and development and has been recently made available online via www.learnaraby.com. The knowledge its carries and methodologies its employs makes it amenable to be customized in languages other than Arabic and to be presented as an international solution for the long standing illiteracy impediment in various languages. Current Research is underway to customize Ikraa to serve language and ICT literacy needs in other languages.

We look forward for the widespread of Ikraa and to make it available to the world wide community in all its versions via www.learnaraby.com.

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Biography



Dr. Ghinwa Jalloul has Ph.D. In Information Technology From University of Technology, Sydney (UTS)- 2004, Under Australian Post Graduate Academic Award 1992. She has won Award Winner of Arab Distinguished Women (<http://www.arabwf.org>) in Politics and Public Domain for 2007, Arab Women Studies Center, Under Umbrella of Arab League, MENA REGION-2007 and Creativity Award from UNESCO in 2009. She is Chairperson/CEO of (2002-todate), *.Technology sarl (<http://www.technologysarl.com>), A multi-Track Software Consultancy and Development house.

Dr Ghinwa Jalloul assumed the following positions: Member of Lebanese Parliament, Beirut 2000- 2009, and assumed following duties, Elected Chair of Information Technology Parliamentary Committee,

Elected Speaker of Communication & Media Parliamentary Committee, Member of Education and Culture Committee, Member of Women Committee; Expert , International Telecommunication Union (ITU) 2009 ; Correspondent of The United Nations Institute of Training & Research For Middle East & North Africa (MENA) Region, 2006 – 2008; Founder Member and Assistant Secretary General of Working Women Committee (Arab Labor Organization); Assistant Prof. of Computer Science at the American University of Beirut (1994-2000), and assumed the following duties, in addition to teaching; Senate Member at the American University of Beirut and member of other University Committees including Academic Committee, Senate Admission Committee; Member of American University of Beirut Technology Committee for advising on external ICT and academic Projects including American University of Sharja (UAE), Kingdom Schools (Riad-KSA); Participated in founding and developing Computer Science programs (BSc. And MSc.) ;Member of ARABI Board (Arab Airline Carriers), Arab Airline Carrier Organization; ICT Advisor for Lebanese National Airline Carrier (Middle East Airlines) for setting ICT reform strategy and implementation; Chair of Scientific Committee and one of the founders of The First Regional Conference on Legislation of Electronic Transactions, 2009; Keynote speaker, speaker and chair of Sessions at many Local, Regional and International conferences and Fora.

Dr. Jalloul Contributed to authoring ITU Connect a School, Connect a Community IT toolkit, <http://www.connectaschool.org>; Proposed as a parliamentarian, IT/e-transaction law for Lebanon and lead its development; Participated in the formulation of Computer Science BSc. and MSc. and computational science programs for the American University of Beirut; Author of many Scientific publications in International Journals and Conferences including ACM, JOOP, OOPSLA. Author of Book, UML by Example, by Cambridge press. Dr. Jalloul is sited on www.whoisshe.lau.edu.lb, www.whoswhoarabwomen.com, www.bigsisters.org.uk/pioneeringwomen.php