Accelerated Literacy and Information Literacy can be achieved through access to new technologies

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Abstract

Although it is recognised that Accelerated Literacy and Information Literacy can help disadvantaged groups in both the developed and developing worlds improve their opportunities for developing their intellectual potential, there are a number of ethical issues that are invoked including equity and access. What came to be known as the Digital Divide is widening. The gap between the information haves and have-nots is widening. Digital exclusion, which has been noted even among different social groups in advanced economies, presents a huge challenge to international agencies, governments, scientists and educators.

In this paper we report on case studies and initiatives from the Information Literacy movement that are utilising the rapid advancement and accessibility of leapfrogging technologies, in the last 10 years, in order to address the ethical issue of equity and access in Accelerated Literacy and Information Literacy in both the developed and the developing country/nations. We conclude with suggestions for broadening efforts to address access to and use of
technologies together with social policies for nurturing technological citizenship, and for fostering social mobility for disadvantaged groups worldwide.

1.0 Introduction

In 2005 at the High Level Colloquium on Information Literacy and Lifelong Learning a proclamation was made stating information literacy as a fundamental basic human right in the digital world. The exercising of this right would empower people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It also fundamentally promoted social inclusion in all nations. Accelerated Literacy can be viewed primarily and simply as the process of teaching language in the context of spelling, grammar and vocabulary. However, it also engenders in the learner an essential way of thinking, which is a vital part of being able to decode text and therefore succeed educationally.

The use of computers and the Internet has become ubiquitous and expanded into every aspect of our personal lives and businesses. The deployment of computers and the associated data communications technologies and data storage devices have had a colossal social impact. The utilisation of these technologies has changed the environment in which computers are used. It has changed the landscape, and the functioning of the economy, health, education, industry, agriculture and many other spheres.

For the majority of people who have access to education and modern technologies there is an enormous amount of information available. Finding, evaluating, criticising, selecting and using relevant, accurate and useful information has been termed as Information Literacy.

1.1 From Information Society to Knowledge Society

Data, information and knowledge are constructs linked through a process of collection and collation from the real world, analysis, identification of trends and visualisation (i.e. information), and sense-making, internalisation and understanding. In turn knowledge is externalised as additional information captured and stored to enrich the data and so on. In the end actions (in the real world) are informed and decisions are taken.

Similarly to the ownership of manufactured, tangible goods, information is no longer an abstract construct but is an intangible commodity, hence an asset. The metaphor information society encapsulates the infrastructure, the technologies but also the attitudes and practices affecting all aspects of life.
“Information technologies, and especially the Internet and mobile telephony, have enabled the development of the Information Society. This sector represents nearly 4% of employment in the European Union (EU).” [1] The EU promotes the development and dissemination of new information and communication technologies (ICT) through legislation and policies recognising the need and the importance in a globally connected and inter-dependent world.

The knowledge society presupposes information society. “Information Society Services, kServices. These are so far called ‘eCommerce’, ‘eService’ or ‘eGovernment’. This however is connected with the form of rationality created in social division of labour. It cannot be managed in global network. Characteristics which are tried to describe by ‘e’, ‘electronic’, are aimed at service that is same as before, but is conducted by ‘electronic’ devices through network. More reasonable acronyms are kServices, knowledge Services, kCommerce and kGovernment. They are based on the fact that all social relations are based on knowledge, but this is normally hidden into historically developed social ‘structures’. Such exist not in network society, where basis of social relations in knowledge is apparent.” [2]

2.0 Accelerated Literacy and Information Literacy

For the majority of people who have access to education and modern technologies there is an enormous amount of information available, hence the importance of being information literate. Information literacy is a fundamental basic human right in the digital world [3].

2.1 Accelerated Literacy

Accelerated Literacy (AL) is a research based literacy teaching methodology, which was specifically developed and implemented in order to improve the literacy outcomes of Aboriginal students at an accelerated rate, while improving outcomes for all students in the class [4]. The premise of this teaching methodology is that you can’t teach complex skills from simple text, thus the use of rich, age-appropriate text. Students lagging behind in their reading cannot get on an even keel with others at a higher level unless they are taught at that higher level. If taught at a low level, then according to AL that’s where they’ll stay. Thus Accelerated Literacy helps teachers to teach at the level they want students to reach, which may be four or five years above where they currently are.

In tandem with teaching methodologies such as Accelerated Learning the potential for the indigenous, marginalised and poor to break through the social and geographic obstacles is increased by not only having considerably increased capacity to access information and to share experience and practices in almost any part of the world but also to be information literate.
2.2 Information Literacy

The Chartered Institute of Library and Information Professionals (CILIP) define Information Literacy as “knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner” [5]. In order to assist librarians and teachers to effectively deliver information skills to their learners, models can be adopted. CILIP Information Literacy Group lists Information Literacy models for utilisation by librarian and teaching practitioners, including SCONUL (Society of College, National and University Libraries) Seven Pillars of Information Literacy and ANCIL (A New Curriculum for Information Literacy) [6].

2.2.1 Information Literacy Models

The ANCIL model commences with the student’s transition into higher education and culminating in the transition out of higher education and into the workforce, which includes using skills in everyday life. Coonan and Secker observe that there is much correlation between the ten thematic strands that constitute ANCIL and SCONUL’s 7 Pillars, detailed below [7]. CILIP have developed an IL model that contains eight competencies / understandings that a person requires to be information literate [8]. The SCONUL Working Group on Information Literacy (Society of College, National and University Libraries) introduced the Seven Pillars of Information Literacy Skills model. The seven pillars are organised into the following concepts: Identify, Scope, Plan, Gather, Evaluate, Manage and Present [9]. There are a series of statements relating to a set of skills/competencies and a set of attitudes/understandings used to describe per pillar.

2.2.2 The RINGIDEA Project

The EU TEMPUS programme, supports the modernisation of Higher Education in partner countries of Eastern Europe (Albania, Bosnia and Herzegovina, Kosovo and Montenegro), to develop Information Literacy for lifelong learning and knowledge economy [10]. The RINGIDEA Tempus project is underpinned by the notion of libraries and information literacy (IL), which is a precondition for lifelong learning, knowledge economy and labour markets. Specifically this project attempts, amongst other things, to: incorporate IL programmes in curricula, develop online IL policy and guidelines and modules and strengthen the capacities of HE institutions for the strategic planning and implementation of IL programmes. In doing so the aim is to develop lifelong learning in society as a whole. Information competencies are a key factor in lifelong learning. They are a vital step in achieving educational goals. The development of such competencies should take place throughout citizens’ lives. The transferability of these competencies is vital for the Information and knowledge society.
3.0 Ethical Issues Concerning Equity and Access

An application of Equity and Access, a conventional and generic ethical concept, can help flag issues such as digital exclusion [11]. Digital exclusion, which has been noted even among different social groups in advanced economies, presents a huge challenge to international agencies, governments, scientists and educators. Therefore, decision and policy makers must be instructed that their opinions on these matters should not simply be based on empirical evidence, but must also be grounded in careful ethical reasoning about issues of equity and access in current society.

3.1 Issues of Equity and Access in Developed Countries

Many changes have been occurring in identifying vulnerable groups who are subject to social disadvantage as a consequence of age and disability, low educational achievement, poverty and living in remote rural areas [12]. These groups of people despite living in developed countries often with strong economies are not included or not keeping pace with technological developments and opportunities. Approximately 9.5 million people, equating to nearly 20% of the UK population lacked the basic online skills needed to send and receive email, use a search engine, browse the internet and complete online forms. Nearly three-quarters of adults who lack these basic online skills are vulnerable people, who are poor, have disabilities or are older [13]. In statistics released in May 2014, the Office for National Statistics informed that 6.4 million people had never been online [14]. In a report making the case for universal digitisation calculated that the deficiency of online skills was costing the UK economy £63bn in additional annual GDP growth. Universal digitisation provided for substantial economic and social benefits for small and medium sized enterprises (SMEs), charities, and government [15].

There are demographic differences in broadband adoption in the United States (US). The statistics suggest that broadband adoption levels are especially low among three demographic groups in particular: age 65 and older, those who have not received a high school diploma, and those with an annual household income of less than $30,000. The statistics also revealed that broadband adoption levels were low for rural residents; African Americans and Latinos; and those with physical disabilities or severe chronic health conditions [16].

3.2 Issues of Equity and Access in Developing Countries

The International Telecommunication Union reported that of the 4.3 billion people not yet using the Internet, 90% live in developing countries. In the world’s 42 Least Connected Countries (LCCs), home to 2.5 billion people, access to ICTs remains largely out of reach for many. This is particularly so for these countries with large rural populations [17]. Although Africa stands out with a relatively impressive mobile broadband growth rate of over 40% in 2014, we are reminded that only 7% of the continent's inhabitants are online [18]. In addition, across the continent there are marked regional differences. Other important factors to note are
that the internet's limited reach is compounded further because the language of the web is English and mobile connectivity is limited as only 18% of Africa's mobiles are smartphones. The World Economic Forum reported tiny progress had been made in bridging the digital divide between technology savvy nations and others [19].

4.0 Leapfrogging Technologies

Technology Leapfrogging refers to the deployment of advanced technology in an application area where immediate prior technologies have not been adopted. It can be viewed as a 3-stage process: (1) Importation of a technology without any significant dependence on the prior art, (2) Widespread adoption and capacity to modify or tailor the technology to local needs, and finally, (3) Development of indigenous capability to truly innovate and improve on the technology imported. There are many developing countries that lack an established broadband infrastructure [20]. Thus they are unable to offer Internet access through traditional telephone services. However, many of the world’s have-nots are gaining access to the Web via mobile phones, a way for bridging the digital divide allowing the developing world to catch up. This is dubbed as technology leapfrogging, i.e. the importation of mobile technologies without having to build out expensive broadband networks (prior art).

4.1 Mobile Leapfrogging

People in developing countries, especially in the world's poorest continent, Africa, are utilising mobile phones for online activities that others normally perform on laptops or desktop computers as the technology overcomes weak or non-existent landline infrastructure. By using electromagnetic radio waves to send and receive the sounds that would normally travel down wires, mobile phone technology is free from reliance upon physical infrastructure such as roads and phone wires. The base-stations can be powered using their own generators in places where there is no electrical grid and the level of literacy to operate a phone is relatively low in comparison to using a computer. Common examples of mobile devices in relation to mobile technologies include: mobile phones, PDAs (Personal Digital Assistant), tablet PCs and laptops. It also includes hand-held video game consoles.

4.2 Case Studies and Initiatives showing Equity and Access facilitated via Leapfrogging Technologies

4.2.1 Kenya

M-Pesa is a mobile-phone based money transfer and micro financing service. M-Pesa allows users with a national ID card or passport to deposit, withdraw, and transfer money easily with a mobile device [21]. Kenya is a largely cash based society and the service, offered by M-Pesa has been praised for facilitating millions of people to access a formal financial system and for reducing crime. The success
of the technology lies in necessity: whereas in the developed world between 96-98% of people have bank accounts this is not true in rural Kenya where travel to the nearest bank may be difficult. The M-Pesa mobile phone service allows users to circumvent these hurdles, permitting 50% of the poor, unbanked and rural populations to use the service [22].

4.2.2 India

Some positive lessons as well as areas presenting problems have been reported from the SARI project in rural India. SARI provided access to internet for banking and e-commerce through kiosks (similar in concept and operation to a tele-centre but smaller). There are a number of issues with diffusion as follows: “...we found that diffusion was biased along lines of gender (more males than females), age (users are usually younger than 30), caste (scheduled caste members are less likely to use the facilities save in those villages where the facility is located in a scheduled caste area), religion (Muslims and Christians are under-represented as users in some villages), educational attainment (with few illiterate users), and income (users are richer as measured by standard surrogate indicators)”[23].

4.2.3 Australia

It has been reported that there is poor school outcomes of indigenous Australians despite improvements to educational access and that a more effective tool for accelerated learning will help close the gap in outcomes [24]. They report the challenges identified and the way in which the Murdi Paaki project attempted to address. “Central to such a toolkit is strategies that can provide Indigenous students with the literacy skills they need to engage successfully with the curriculum at each stage of schooling.” The Murdi Paaki project included in-service training for teachers and opportunities for Indigenous parents and community members “to develop the skills to support their children’s literacy acquisition and enhance their capacity to become active participants in their children’s education.”

4.2.4 Western Balkans and the contribution of the RINGIDEA project

Regional development of the information society and lifelong learning is a priority for the Western Balkans as they move towards an Information Society. The development of better IL skills contribute positively to regional cooperation, business environments and hence foreign and national investments for the creation of much needed jobs that will encourage individual initiatives and so add to an increase in the living standard of the whole population. RINGIDEA is a technology transfer project which enabled the identification of need and at the same time good practice in the region itself but also across the EU project partners and further afield. As a result the project developed IL policy, guidelines, clear specification of goals, mission and guidelines for developing IL programmes online and IL modules. A major contribution of the RINGIDEA project is the integration and
harmonisation of the new IL programmes with those currently active (however embryonic) in Western Balkan countries.

The RINGIDEA project proposed new methods for IL delivery by harmonising cultural diversity. A set of new products (online modules, teaching materials, policy) were developed. Knowledge transfer can take place at all levels and the results can be used in new contexts or in other Western Balkan countries that can customise the results to suit their conditions. This project ensured visibility through dissemination, trainings and conferences. Media coverage of program objectives, outputs and outcomes have helped raise awareness of the wider social impact and the importance on perpetuating IL programs in Western Balkan countries. Mobility of librarians, teaching staffs and experts have opened a new door of opportunities where idea of implementation of lifelong through IL has been reviewed, analysed and recommended. There are opportunities to develop the project results in different contexts and situations (e.g. Western Balkan area, EU Member states), embedding project results into practices of other organisations, mainstreaming project results into local, regional national or European provision.

4.2.5 Design for All

A number of global, European and national initiatives have attempted to support digital inclusion in order to address the needs of all those who are subject to social disadvantage as a consequence of age and disability as well as other factors such as low educational achievement, poverty and living in remote rural areas. Over the last twenty to twenty-five years design for all principles and practices including Assistive Technologies, have been collected into formal and informal courses which have been used to train designers of Information and Communication products and systems [25]. Through the application of design for all principles there is an opportunity of designing systems that are better matched to the existing needs of those who are technologically disadvantaged.

4.2.6 UK Parliamentary Policy

There has been a steady increase in the aged population over the years, and with the retirement age in the UK being increased, there is a need for those over sixty-five to develop and maintain their digital skills. Today those without access and skills in IT literacy can become isolated, not only from friends and families, but also from sources of information necessary to assist their well-being. Ability to investigate, and perhaps purchase online, suitable sources for food, energy, travel and entertainment, could improve the quality of life. To be able to investigate problems and potential support could be of assistance, especially for the elderly.

The UK government tried to address this issue with various initiatives, including their "Give an Hour" scheme. Ross was involved in arranging this in Southampton, linked with students from Southampton Solent University. Various charities, whose aims were to help the elderly and disadvantaged, participated in this
initiative. Arrangements were made for the elderly to be paired with a student, for one-to-one sessions. This was replicated in various parts of the UK. The elderly participants could use their own equipment or equipment was provided for them. In all cases, they reported benefits from the scheme by gaining confidence and developing their IT literacy in the areas that were relevant to their lives.

4.2.7 British Computer Society Initiatives

The results of a survey organised by the BCS, The Chartered Institute for IT, of HR professionals and employers indicated that over ninety per cent of them felt that being able to operate digital devices was important in their organisation to the majority of the roles [26]. The BCS has encouraged the growth of IT literacy. It led the way with the introduction of the ECDL (European Computer Driving Licence) in the UK. The first accredited centre for this within the UK was Southampton Solent University, led by Ross, who also produced the first student to complete the ECDL in the UK. The equivalent qualification, ICDL (International Computer Driving Licence) is widely used in many countries. This qualification is aimed at all ages to provide a basic set of IT skills for computer users, whether for to support their employment or for leisure. This involves online tests of skills, ranging from the use of e-mails, the Internet, handling files and packages, such as a spreadsheet, database and power point. The ECDL/ICDL programme has now been taken by over eleven million people across one hundred and forty-eight countries in forty-one different languages. The numbers who have taken the ECDL in the UK is over two million people in the UK [27].

5.0 Recommendations

5.1 Literacy, IT Literacy and Information Literacy

As demonstrated by the initiatives across both the developed and developing worlds Literacy is a prerequisite for Information Literacy. It is not possible to isolate and deal with obstacles to Information Literacy without tackling the levels of illiteracy particularly in Sub-Saharan Africa and parts of Asia. In addition, the unprecedented development and widespread use of ICTs people across the world tend to seek and use vast amounts of information readily available on the internet. Access to education and the bridging of the digital divide are imperative for addressing the many socio-political divides and inequalities. Leapfrogging technologies have proved to accelerate literacy and information literacy. Thus it can be seen that IT Literacy is nowadays also a prerequisite for effective Information Literacy. Remote communities as sections of the population such as the elderly, the disabled in the whole world can benefit from access to technologies and information.
5.2 Moving from Knowledge to Wisdom

The journey of understanding starts from researching and gathering data/parts. It proceeds to absorbing and connecting parts into information. The third stage is that of knowledge where understanding involves acting, integrating (into a whole) and interacting. When knowledge is absorbed and understood the next stage is that of wisdom which is based on reflection, joining of wholes and incorporating innovation. It is stated that with wisdom people can create and mould the future because at that stage vision, design and creativity are incorporated [29]. As can be seen from Fig.1 the quality of decisions and the adding of value (whether that is financial, social, moral, ethical or political) is based on the level of understanding. It is only at the Wisdom level that through reflective, analytical and collective application of knowledge in action that results in efficient and wiser decisions. It is not possible to bypass lower layers but we assert that the journey can be accelerated through the use of technologies.

![Diagram of data, information, knowledge, and wisdom]

**Figure 1:** Relations between data, information, knowledge and wisdom. Source: Adapted from Liebowitz, [28]

It is imperative that inequities and the digital divide across the world and within countries and groups of people divided by class, social stratum, gender or age are addressed to enable the citizens of what come to be known as the knowledge society to fulfil their potential and play a full part in society.
6.0 Conclusions

To achieve the goal of reducing the digital divide, it is naïve and simplistic to suppose that a solely technological solution will enable the bridging between the information haves and have-nots. The narrowing requires the construction of legal, cultural, and economic infrastructures. These technologies can be used to help disadvantaged groups in both the developed and developing worlds improve their life chances. Conversely, social and economic equality cannot be bought about solely by leapfrogging technologies. In order to fight these injustices of equity and access, in order to create a more inclusive and empowering technology requires a shift from teaching technical skill to nurturing critical technological citizenship, building resources for learning, and fostering social mobility.

In order to build knowledge societies, it must be acknowledged that there are two fundamental challenges posed by the information revolution: i) bridging the digital divide and ii) guaranteeing the future of freedom of expression. A global information society cannot exist when there is unequal access of certain countries to information sources, contents and infrastructures, nor when the free flow of information is impeded, or when information itself is censured or manipulated.

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7.0 References


