A holistic, user-driven approach to the development of an innovative, open-access Educational Framework for six existing and emerging information-related literacies

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Abstract:

Purpose - This article discusses a holistic, user-driven approach for the development of an innovative, open-access Educational Framework that includes six emerging information-related literacies. The Educational Framework of these literacies should be based on the structural support offered by the various Information Literacy models and is addressed to educators and librarians.

Design/methodology/approach

The proposed Educational Frameworks' possible stakeholders and partners should plan for specific activities that will lead to the achievement of three main objectives: (a) the development of a freely available Information Literacy Training Package; (b) the training of educators and librarians, in the core skills of Information Literacy, as a horizontal goal and in new literacies as vertical goals; (c) the convergence in terms of strategy, expertise and infrastructure in Information Literacy initiatives, at a co-operative and even at a transnational level.

Expected impact – The open access dissemination of information-related literacies concerning: critical thinking regarding issues of equality and tackling the social injustices against marginalized groups in communities; making the most of peoples' multiple interactions with digital technology and media; mobile tailored learning contents are cost effective and accessible for persons with learning disabilities; freedom of expression and information, empowerment of citizens to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producers of information and media content; understanding and production of reliable news stories and scientific papers, based on data; dissemination and fostering of the Sustainable development goals, through the lenses of Information Literacy.

Originality/value - The proposed Educational Framework is a conceptually, strategically, technologically and educationally pioneering endeavor in answering specific urgent demands of the current Information and Knowledge Society.

I.   INTRODUCTION

The advent of the Internet and the constantly evolving technologies have transformed our society in a global interconnected and information-saturated dynamic system. In this technology and information driven society, humans are faced with unprecedented challenges in all sectors of life. Undeniably, becoming an information literate human being is one of the 21st century key skills for one's well-being, especially in education, in the work-place, in civic responsibility, etc. One of the most typical definitions of Information Literacy is "*The adoption of appropriate information behavior to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society*"[1].

Additionally, other existing and emerging literacies are considered vital for personal, social, professional and environmental awareness feasibility. Among them are the following six: Critical Literacy-focusing on inequalities, Digital Literacy, Mobile Literacy, Media Literacy, Data Literacy and Sustainable Development Literacy. The cultivation and dissemination of these literacies can have a meaningful impact on society.

An innovative approach to enhancing and disseminating them is to design and apply an educational framework based on the structural support that the already established models of Information Literacy offer. Adaptation to an Information Literacy model, such as SCONUL[2], ACRL[3], and others, can lead to acquisition of the ability to define the information you need, the skill to search and access this information and the competencies to critically evaluate it and to use it wisely, and to acknowledge the information's original creator.

Arguably, among those who are placed in the heart of promoting the above literacies to today's Information & Knowledge Society, are educators, in various educational environments and librarians, in different kinds of libraries. For this reason, it is crucial for them to develop these competences in order to embed and apply Information Literacy, as well as various emerging information-related literacies. The application could occur in formal or informal

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educational environments and in real-life settings, regarding social, professional and environmental, as well as, active citizenship, Mass and Social Media and personal life goals. Especially librarians, need to expand further their Information Literacy skills in order to meaningfully support educators, youth and the communities they serve.

This article proposes a holistic, user-driven approach to the development of an innovative, open-access Educational Framework for six emerging information-related literacies. The Framework is based on the structural support offered by the various Information Literacy models and is addressed to educators and librarians.

II. SIX EXISTING AND EMERGING INFORMATION-RELATED LITERACIES

A. Critical Literacy focusing on inequalities

Critical Literacy (CL) is the ability to decode various texts, images and audiovisual material, contained in different types of media, and in print, digital and electronic documents, to discover any possible bias or preconceptions that the author/content creator might have incorporated [1].

This is done by analyzing the messages which promote prejudiced power relationships found in media and in documents, since authors and content creators use consciously or unconsciously their social and political influence when they express themselves. By learning how to read between the lines, namely beyond the author's words or creator's works and how to examine the manner in which the author/creator has conveyed his or her ideas about society's norms, people will be able to determine whether these ideas encapsulate racial, cultural, religious, political or gender preconceptions, that otherwise go unnoticed [2].

The development of critical literacy skills, with a focus on inequalities, is important because when actively engaging with the content of texts, images and audiovisual material, people can become more perceptive and societally aware citizens and may avoid receiving the various messages around them without first decoding and relating them back to their own personal life experiences. Overall, critical literacy teaches people how to dispute views regarding issues of equality and how to question the power structures in their society, aiding them to tackle the social injustices against marginalized groups in their communities [3], [4].

B. Digital Literacy

The spectrum of Digital Literacy (DiL) is broad, and this becomes obvious as organizations and institutions choose to highlight different aspects of it.

Jisc refers to the term "*Digital Literacies*", defining it as "*those capabilities which fit an individual for living, learning and working in a digital society*". **Jisc** employs a seven strands model where critical thinking and creativity is applied to the broad range of interactions that each one has with and via digital technologies. The seven elements of digital literacies in **Jisc** model, are depicted in a round lateral thinking interrelation and include information literacy, media literacy, communications and collaboration, career

and identity management, ICT literacy, learning skills and digital scholarship [5].

The British Computer Society's (**BCS**) Digital Literacy projects are exploring methods of improving three key areas, namely employability, education and society. These are reflected at six specific digital literacy qualifications, which they deliver: Computer basics, Online basics, Audio and video software, Digital media, Digital music, Digital photography and Social networking [6].

A general definition of digital literacy, that denotes many aspects of its importance, has been formulated by the European Information Society : "*Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.*" [7].

C. Mobile Literacy

Mobile learning focuses on the mobility of the learner, on the ubiquitous computing, meaning wireless networks that work together with mobile devices and applications to form the infrastructure of mobile learning and on the development and evaluation of pedagogically sound educational mobile tools and contexts [8].

Mobile Literacy (ML) is an emerging literacy that has not been yet conceptually defined. While it may encompass mobile learning [9], it may also relate to the widespread adoption of m-devices (e.g. mobile phones, handheld computers, MP3 players, notebooks, tablets and other newly invented mobile devices and technologies), m-applications and m-interactions in all other fields of life, such as consumption, economy, science, healthcare, citizenship, etc. [10], [11].

Building on ACRL's Framework of Information Literacy for Higher Education [12], it is proposed that mobile literacy may incorporate all six ACRL frames (*Authority Is Constructed and Contextual, Information Creation as a Process, Information Has Value, Research as Inquiry, Scholarship as Conversation, Searching as Strategic Exploration*) and practically interrelate them with the mobility of the learner (or citizen/scientist/consumer, etc.), ubiquitous computing and reliable mobile tools and contexts, to foster information related human competences in a mobile ecosystem [13], [14].

D. Data Literacy

Data Literacy (DaL) is the capacity to find, evaluate, interpret, use and present data related information in effective and ethical ways. Although it bares many resemblances to information literacy, data literacy focuses mainly on the consumption of knowledge and on the coherent production and critical thinking about data. It encompasses statistical literacy as well as understanding how to work with large data sets, how they are produced, how to link different data sets and how to understand and

portray them.

Moreover, as open data has spread worldwide, different stakeholders consider data literacy an important 21st century skill. Therefore, initiatives that actively pursue the promise of open data as a tool of wider popular empowerment become even more crucial in comparison to investments on data for expert communities only. In light of low levels of data literacy, it is domain or subject matter experts, rather than data specialists, who actively foster development of cross-sectoral linkages and establishment of shared data infrastructure. Among them librarians and educators are in the right place to promote data literacy to the median data information user **[15], [16]**.

E. Media and Information Literacy

According to IFLA[4], Media and Information Literacy (MIL) is the competence that individuals, communities, and nations need in order to effectively and efficiently "*survive and develop, make decisions, and solve problems in every facet of life –personal, social, educational, and professional".* This information is about *"themselves as well as their physical and their social environments"* and it is "*available via three processes: observation and experimentation, conversation (with other persons), and consultation (with memory institutions).*" **[17].**

Moreover, Media and Information Literacy is a significant requirement for enabling equity in access to information and knowledge and for supporting free, independent and pluralistic media and information systems. MLI acknowledges the eminent role of information and media in people's everyday lives. It is one of the most important literacies in the information era because it lies at the core of freedom of expression and information, enabling citizens to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producers of information and media content.

More specifically, the skills that MIL can develop include: understanding the role and functions of media in democratic societies; knowing the conditions under which media can fulfil their functions; developing the ability to critically evaluate media content; enabling people to engage with media for self-expression and democratic participation; developing people's reviewing skills (including Information and Communication Technology-ICTs skills) needed to produce user-generated content **[18], [19]**.

F. Sustainable Development Literacy

Our Common Future, published by the World Commission on Environment and Development defines sustainable development as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" **[20]**.

Gradually, the global debate on sustainable development continues and is enriched with additional goals, as was done at the United Nations Summit on September 25th, 2015 in New York, where the 2030 Agenda for Sustainable Development was formally adopted, including 17 goals (SDGs), which have been applicable since January 2016 and should be implemented by 2030. It is vital that everyone is informed about the (SDGs) 2030 Agenda[5].

The goals concern zero poverty and hunger, good health and well-being, quality education, gender equality, clean water and sanitation, cheap and clean energy, decent work and economic development, flexible infrastructure development, promotion of sustainable industrialization and promotion of innovation, less inequality, sustainable cities and communities, responsible consumption and production, urgent action to combat climate change and its impacts on sustainability and sustainable use of life on land, in peace, justice and strong institutions. However, the emphasis is on revitalizing global cooperation for sustainable development, with the aim of alleviating global barriers to generalized geopolitical and economic competition, as well as to individualism **[21]**.

Innovative initiatives and pedagogies are required in order to design and implement actions and educational frameworks for sustainable development. It is important that the above should encourage learners to develop Sustainable Development Literacy (SDL) through critical reflection and experiential practices based on the fundamental Information literacy skills of discovering, evaluating, communicating, participating/acting **[22]**.

III. PROPOSAL FOR AN EDUCATIONAL FRAMEWORK FOR SIX INFORMATION-RELATED LITERACIES

The Educational Framework for the six aforementioned literacies proposes innovative approaches and digital technologies for teaching and learning. More specifically, it suggests the design, test and application of various teaching models and practices, which derive from already established learning theories (e.g. behaviorism, cognitivism, constructivism, gamification, connectivism, etc.) **[23]** and can be applied in different educational technologies (Virtual Learning Environments -VLEs, Open Educational Resources-OERs, media, social networks, etc.) **[24]**. Moreover, it proposes a transnational, co-operative, continuous and open access strategy in the development, dissemination, implementation, evaluation, re-usability and update of an Information Literacy Training Package (ILTP). The ILTP should be designed in ways that can support end-users, namely educators and librarians, in developing their own practice every time they transfer the e-content and the training approaches of the ILTP, in order to tailor them to the needs of their own communities.

The proposed Framework is a conceptually, strategically, technologically and educationally pioneering endeavor in answering specific urgent demands of the current Information and Knowledge Society (see Figure 1).

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[4] International Federation of Library Associations and Institutions - https://www.ifla.org/

[5] Sustainable Development Goals Knowledge Platform - https://sustainabledevelopment.un.org/post2015/transformingourworld
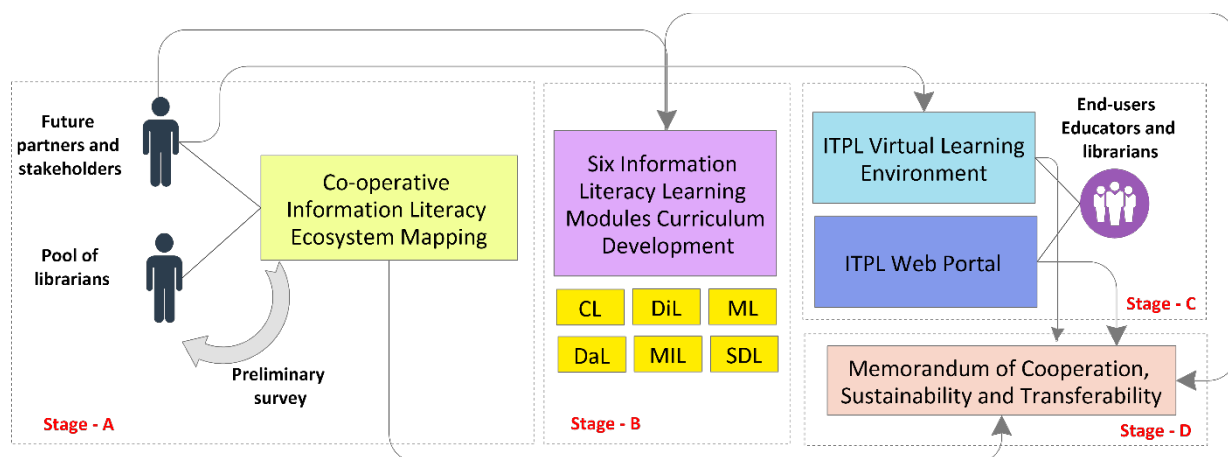
Figure 1. Overview of the Educational Framework for six Information related Literacies

At a conceptual level, the Framework is innovative as it is unique in recommending the implementation of training programmes for New Literacies (Critical Literacy-focused on inequalities, Digital Literacy, Mobile Literacy, Media and Information Literacy, Data Literacy, Sustainability Literacy), especially within a horizontal framework underpinned by the core structural skills of Information Literacy.

At a strategic level, the Framework fosters innovation by proposing the dynamic development, establishment and dissemination of New Literacies, based on the structural support of Information Literacy models, firstly among a core number of stakeholders and in the future, at a wider even transnational level. It should be based on a mutually beneficial memorandum of cooperation, sustainability and transferability between all parties. Furthermore, the Framework should be dynamic and on-going because it suggests that the participants, the multipliers and the end-users will be adding new content and learning/teaching approaches/techniques to embed pertinent material and to develop their own practices to serve their local communities.

At a technological level, the Framework should employ the use of advanced, open source and freely available VLEs, e-content, OPRs, materials, documents and media, in inventive ways. Respectively, at an educational level, the ILTP learning modules should be designed, implemented and evaluated based on new teaching models and approaches, that can derive from the bidirectional convergence between the already established aforementioned learning theories and the constantly emerging educational technologies. Therefore, the ILTP should generate quality, efficient, innovative, sophisticated, interactive and tailored-to-the need of trainees' outputs.

IV. BASIC METHODOLOGY FOR THE IMPLEMENTATION OF THE EDUCATIONAL FRAMEWORK

This Educational Frameworks' possible stakeholders and partners should plan for specific activities that will lead to the achievement of three main objectives: (a) the development of a freely available Information Literacy Training Package; (b) the training of educators and librarians,

in the core skills of Information Literacy, as a horizontal goal and in existing and new literacies as vertical goals; (c) the convergence in terms of strategy, expertise and infrastructure in Information Literacy initiatives, at a co-operative and even at a transnational level.

Specific interrelated tasks that should be assigned to future partners and stakeholders concern the following four actions which should lead to the objectives' deliverables.

A. Co-operative Information Literacy Ecosystem Mapping

In the preparatory stage, future partners and stakeholders, should distribute the six different information-related literacies described in this Framework, according to their expertise and availability, in order to undertake a relevant literature review that will capture and map the state of research for these literacies. One of the partners should be appointed as the leader of this action and each other partner should be submitting an intermediate report of their progress, while their final obligation will be to submit a complete mapping report to the leading partner in an arranged time.

Furthermore, the leading partner should submit to all participants a set of key features for a needs' analysis aiming at the creation of a pool of trainees, mainly educators and librarians. The needs analysis should focus on the identification of their qualifications, such as their expertise in the various subjects of the new literacies, experience in distance learning programmes, etc. and on the identification of their various characteristics, such as specification of their learning needs, communities they serve etc. Following this, the leading partner should call all partners to create a pool of trainees, based on the above needs' analysis. The total number of trainees, namely educators in various types of education - formal, informal, non-formal - and librarians in different kinds of libraries, should be depending on each partner's specific educational and library ecosystem.

After the needs analysis completion, and the creation of the pool of trainees, the participants should submit the results to the leading partner. The leading partner should integrate all contributions into a final co-operative needs analysis report.

Additionally, the leading partner should provide to all partners a preliminary survey template aiming to the optimal development of the main components and content for the six Learning Modules curriculum, that will be included in the Information Literacy Learning Package. Both, curriculum components and content may include language, scope and importance, aim, learning objectives, content, bibliography, teaching methods-models-practices-approaches, evaluation and feedback methods, etc. The leading partner should ask the other partners for review and final approval.

Educators and librarians should participate in the preliminary survey to determine and finalize the main components and content of the curriculum for the six Learning Modules that will compile the Information Literacy Learning Package. After the survey completion, participants should submit the results to the leading partner that will integrate all contributions into a co-operative final report and the leading partner should send it back to all members for feedback, final editing and approval.

The final outcome should lead to the publication of a "Complete Co-operative Information Literacy Ecosystem Mapping" in the form of a book, compiled by each partner's specific contribution.

B. Six Information Literacy Learning Modules Curriculum Development

The aim is to design the pedagogical framework and to prepare the content for six learning modules, based on the results of the "Complete Co-operative Information Literacy Ecosystem Mapping".

The six learning modules curriculum, one for each new literacy, should also include: (1) a generic Information Literacy curriculum template, based on the established Information Literacy Models and (2) Teaching approaches/practices/methods, that derive from various learning theories.

It is proposed that each module's curriculum should be designed within the context of Information Literacy. This is an innovative conceptual approach to the curriculum design of these literacies, that will evolve them into information-related literacies. In more detail, each module will be independent, but all six modules will also form a complete Information Literacy Learning Package for educators and librarians who are interested in continuing their professional development, in the wider and in specific fields of Information Literacy.

Furthermore, the curriculum design should take into consideration various learning theories and teaching approaches, which derive from these theories, in order to offer end users, namely educators and librarians, a variety of quality educational approaches for the development of the different literacy skills, tailored in the needs of the communities that they serve. Trainees should be able to multiply Information Literacy skills both at a horizontal level and at a vertical level, depending on the field that they will choose each time, such as critical thinking with a focus to inequalities, digital, mobile and data literacies, as well as Media and sustainable development literacies.

The final outcome should lead to a complete Six Information Literacy Learning Modules Curriculum Development (SILLMCD), in the form of a text compiled by each partner's specific contribution. It is noted that each partner, including the leading partner should be in charge of the design and creation of at least one learning module, for which they will have conducted the literature review and mapping report, during the previous stage.

C. Virtual Learning Environment & Web Portal for the Information Literacy Training Package

The first objective of this output is to deliver a complete pilot ILTP embedded in an open access Virtual Learning Environment. The specific actions should concern the determination of the ILTP key features, the design and the pilot Implementation of the ILTP, as well as the evaluation of the pilot ILTP in the VLE. The ILPT should be piloted in the pool of trainees, namely educators and librarians, who will have participated in the preliminary survey.

The second objective is to develop, test, optimize and deliver a Web portal for end-users, mainly educators and librarians. The Web Portal should be a gateway and front-end for the ILTP integrated in the VLE, through which the Educational Framework's main target groups should be able to access its main outputs and content.

The two objectives may deliver an innovative outcome, as they will facilitate the integration of Information Literacy, as well as of existing and new literacies in various educational environments and real-world settings, in terms of transferability. The reason why is that end-users, namely educators and librarians will be able to freely re-use and down-load the rich content and the various features in order to serve their local communities, provided that they comply with the directions that should be contained in the Memorandum of Cooperation, Sustainability and Transferability, which follows.

D. Memorandum of Cooperation, Sustainability and Transferability

The aim of this output should be to compile and approve a memorandum of cooperation, sustainability and transferability between all partners. The memorandum should build on the outcomes of this Educational Frameworks' previous stages and it should focus on the provision of recommendations for the continuing update of the Learning Modules of the ILTP, such as copyright and open license issues, preservation and reusability of the content and download of the VLE's code, on-going creation of content and contribution to the developing Information Literacy Community, with new practices on behalf of all stakeholders and users involved, etc. The Impact as well as the innovation of this project is the establishment of common culture, strategy, expertise and infrastructure in Information Literacy initiatives, at a co-operative and even at a transnational level.

V. EXPECTED IMPACT AND CONCLUSION

The Impact of the development of a holistic, user-driven and open access Educational Framework is identified in two levels. (A) In co-operational level there should be established convergence in culture, strategy expertise and infrastructure in Information Literacy initiatives. (B) In local level, integration of IL and new literacies in various educational environments - formal, informal, non-formal - and in real world settings should result in developing, applying and disseminating the following concepts: critical thinking regarding issues of equality and tackling the social injustices against marginalized groups in communities; making the most of peoples' multiple interactions with digital technology and media; mobile tailored learning contents that have the added benefit of being cost effective and accessible for persons with learning disabilities; freedom of expression and information, empowerment of citizens to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producers of information and media content; understanding and production of reliable news stories and scientific papers, based on data and open data; dissemination and fostering of the Goals of Sustainable development, through the lenses of Information Literacy.

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