

Approach to the Concept of Literacy for Information Systems Used in the Business Areas of and Daily Studies

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ARTICLE INFO	ABSTRACT
<p>Keywords: Information Systems Literacy Business Areas Computer Literacy Information Literacy</p> <p>Received 21 August 2019 Revised 10 November 2019 Accepted 18 November 2019</p> <p>Article Classification: Research Article</p>	<p>Purpose – Information systems are a very important part of information technology. Therefore, the use of information systems will be a distinctive feature for humanity in the future as it is today. This situation reveals the discussion of the concept of information systems literacy. In this study, the Information Systems Literacy (ISL) model is designed to assess and evaluate the perceived skills of individuals regarding the use of information systems.</p> <p>Design/methodology/approach – The ISL is a scale of literacy consisting of 8 items developed to assess the unified knowledge, comfort and perceived skills of individuals in the process of finding, evaluating and implementing information systems.</p> <p>Findings – Principal component analysis has made a single-factor solution (57% of the variance). Among 8 items, factor loads vary between.62 and 85.</p> <p>Discussion – ISL is accepted as an assessment tool for evaluating consumer comfort and ability to use information technology in repeating administrations by capturing the concept of information systems literacy in a reliable and consistent manner. Further research is needed to analyse the feasibility of ISL to much larger environments.</p>

INTRODUCTION

The word "literacy", which is defined as the state of being literate, is added as a phrase after various words and is used differently from the meaning of functional literacy. Computer literacy, environmental literacy, economic literacy, graphic literacy, legal literacy, library literacy, financial literacy, political literacy, technology literacy, consumer literacy, media literacy, critical literacy, civic literacy, web literacy are just a few of the examples that can be given on the subject. Every day, a new term is derived by adding the word literacy. (Snaveley and Cooper, 1997:1-7). The concept of literacy is defined as the ability of identifying, understanding, interpreting, bringing together, communicating and calculating different types of written sources and records by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The notion dates back to thousands of years and has evolved over time. The increase in literacy continues with books becoming more accessible as paper and printing become cheaper following the Industrial Revolution.

Computer literacy is the ability to use computers and computer software effectively. Using computers means performing basic tasks such as turning the computer on and off, data storage, copying, printing; the use of computer software means having general knowledge on how to use certain applications such as word processors, spreadsheet software and databases. (Bawden, 2001:3-5), (Horton, 2008:2). Horton (2008) lists the literacy skills he deemed vital for the 21st century into six groups: "functional literacy, computer literacy, media literacy, distance education and e-learning, cultural literacy and information literacy". It emphasizes that these types of literacy partly overlap however they should be seen as complementary elements.

Computer literacy is the concept that is very complicated with information literacy. So it is frequently used alternatively with information literacy. However, computer literacy only includes basic skills related to computer use. Information literacy is a much broader concept that also encompasses computer literacy. IL was outlined as the ability to find and use the information needed to solve problems and make decisions

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(Zurkowski, 1974:6), (Pinto et. Al., 2010:2-5). Today, the use of computer technologies in the storage, access, use, transmission and sharing of information is indispensable, so it's not possible to be information literate without being computer literate. Computer literacy is a part of and even a prerequisite for information literacy (Kurbanoğlu, 2010:1-5).

Today's technology is now evolving into an advanced software-machine relationship such as artificial intelligence and deep learning. Parallel to that, computer and information literacy, which are basic concepts in the literature, are turning into information systems literacy along with other concepts. There is a gap in the academic field on this subject. Information systems literacy (ISL) means that information systems software (ISS) (web, mobile, pc, etc.) can be used regardless of platform. Being able to open up any ISS even if it has not been used before, access to the menus, create and read entries, being aware that there is a database management system running in the background, understanding the logic of web-mobile-cloud broadcast, are within the scope of ISL.

Using information systems requires the ability to address a user-oriented problem by searching for, finding, evaluating, integrating and implementing solutions with the use of information systems. This combined skill requires people to work with technology and remain among a wide range of knowledge tools and resources to gain the knowledge they need to think critically about their subject. That requires people to attainment, sense and handle the information they need to fulfil their wants. Thus, the sources of information such as relevant websites or mobile applications and the grade of such reach are achieved. That contains the nature of the technic and conditions of use, such as privacy or time, to enable people to use e-information resources appropriately (Norman and Skinner, 2006:4).

Access in the age of Internet requires the ability to use the system and extract meaning. Using computers effectively to overcome problems increases along with basic literacy skills regardless of age, income or education. When considering access and literacy issues, it is necessary for IS practitioners in personal or corporate settings to understand the existing capabilities before recommending the system. The aim of this article is to develop and make a psychometric assessment of Information Systems Literacy (ISL) scale designed for individual and corporate structures.

INFORMATION AND LITERACY IN LITERATURE

In order to reach the concept of ISL literacy, computer-information-system-literacy structure should be taken into consideration. However, if we first look at the notion of self-impact, it can be seen that individuals draw great care in their study on motivation (Bandura, 1986:5). Today access, evaluation of information and other quality indicators are fundamentally different in irregular environments where new information is constantly added (Bandura, 1997:6). Therefore, information literacy is important as a new discipline, which is approached in a broad spectrum ranging from the use of computers and access to information, to social, cultural and even philosophical content and effects of knowledge. Individuals who can recognize their need for information, have the know-how and skills to find the information they need, use the tools necessary to find the information and adapt it to another work, synthesize and critically evaluate the acquired information to understand the social, economic and political effects of it, are information literate. Information literacy is the capability to know when and why information is required, where to meet and evaluate the information, how to use and convey it ethically (Kurbanoğlu, 2010:3-7).

In the field of information technology, the perceived competence regarding the use of ICT is important for an individual's confidence in his/her abilities to the assignment. Moos and Azevedo (2009) underline that computer experience or not. But, it is significant to make sure that the predicted achievement by favourable feedback or vocal incentives can be achieved.

In addition, authorization (Calvani et al., 2012:1-3) is a term used to describe what individuals can obtain with technology. Similar to that; the concepts of ICT literacy (Mioduser et al., 2008:3), Computer and Information Literacy (Fraillon et al., 2013:1-4), last decade ability (Binkley et al., 2012:4-6) and technomic ability (Zhong, 2011:2-6) are also in the literature. One of the features these concepts have in common is this a period interested in digital technology is connected using or having the ability to use (Ferrari, 2014). Individuals can easily adapt to new contexts and transfer them (Fraillon et al., 2013:1-3). All these concepts combined are outlined as the talent to "use computers to research, compose and get into touch effectively" (Fraillon et al., 2013:17). In

addition, while Fraillon et al. (2013; 2014) describe the PC just as a component of CIL, the concept of ICT literacy covers a wider case and variety of tools and scaler media.

CIL be formed two general notional predicaments split seven dimensions of content in each case (Fraillon et al., 2013:3-6). The one includes the intelligence of using the pc and the ability to obtain, appraise and operate informatically (Binkley et al., 2012:1-4). The last case, which produces and changes information, involves the use, transformation, and creation of information along with transmission discuss like view his work. Cause for that may be the overlapping of notional categories (Hatlevik et al., 2018:5). In the light of all these, the importance of developing a functional method and testing for evaluating the ISL abilities of information systems users in order to support and improve the use of information technologies becomes very clear.

DEVELOPING A SCALE

A literature review was conducted on each of the six key literates in the most used indexing platform databases to determine the current literacy criteria. Even Though there are a few estimates, some people were meticulously evaluated psychometrically, and little was evaluated for certain situations that are not related to the notion of literacy in the affair to the model of ISL. The items were formed from scratch by the researchers. According to the theoretical model, a pool of starting material was created and an iterative substance abatement was used to create a tool that could be easily implemented within the various mediated environments and contexts. The first design was distributed to colleagues working in the field for their comments and review. Following this initial review, the overall readability design of the ISL was given to people with various demographic information to test the item explanations and relevance. These people had many dissimilar clubby, ethical and pedagogical backgrounds, and stand for different affinity among the general inhabitants. Inquiries were carried out in some part of the participant for 90 days. During this period, validity and reliability studies were conducted. The required revise was made with more participants before the pilot test.

A total of 107 people completed the ISL's first, larger version as part of the pilot test, and immediately commented on legibility and overall use of information technology ($P < 0,05$) after the instrument was filled in paper form. Later, the ISL was reviewed and based on the in quality and reply feedback from the subscribers, academic adaptation and comprehensibility, the final scale of 8 items was formed.

METHOD AND DATA ANALYSES

The study was sampled as 702 people from various class types including different subject areas and formats. Each person was informed about the information system and the structural architectural logic (database, interface, software) of any information system before the papers were handed out. After the errors were cleared out, the remaining 628 of the answers were taken into evaluation.

The surveys were collected from October 2018 to November 2018. Table 1 shows the characteristics of the participants. As shown in Table 1, the gender characteristics of the participants were approximately equal (49,4% male - 50,6% female). 64,6% of the participants were between 26 and 45 years old and constituted a significant majority. Approximately half of the participants (42.4%) have less than a decade of experience in using information systems, indicating a more widespread progress in this way. While most of the participants (55,7% undergraduate, 8,9 graduate) were university graduates, their work positions (48,7% chefs, 29,0 officers) were middle and base employees. Participants reported that they were daily worker of different condition of IT. 92,7% of the participator (N = 582) noticed using web or mobile applications daily) and 5,7% of them (N = 36) reported their usage as being at least once a week. Also, 85,7% (N = 538) used an information system every day, 9,2% (N = 58) used them once per week. So the suitability of the general demographic status of the participants for the study was supported (Table 2).

Table 1. Demographic Results

Item	Variable	Frequency	Percentage (%)
Gender	Male	310	49,4
	Female	318	50,6
Age	Under 25 years	10	1,6
	26-35 years	210	33,4
	36-45 years	196	31,2
	46-55 years	182	29,0
	Above 56 years	30	4,8
IS Use Experience	Less than 10 years	266	42,4
	11-20 years	212	33,8
	21-30 years	84	13,4
	31-40 years	58	9,2
	More than 40 years	8	1,3
Education	High School Diploma	58	9,2
	Junior College	164	26,1
	Bachelor's	350	55,7
	Master's or above	56	8,9
Workplace Position	Senior Executive	12	1,9
	Manager	118	18,8
	Employed	306	48,7
	Student	182	29,0
	Worker	10	1,6
Frequency of Web or Mobile Application Usage	Daily	582	92,7
	Weekly	36	5,7
	Monthly	10	1,6
Frequency of Any Information System Usage	Daily	538	85,7
	Weekly	58	9,2
	Monthly	32	5,1

Internal consistency reliability was evaluated using SPSS RELIABILITY command using SPSS version 22. Reliability (item) analysis was used to determine differences between mail and female. The factors were defined using a basic structural touch remedy set on eigenvalues noticed by using SPSS FACTOR as a basic component analysis. This approach is constructed on a predetermined hypothesis based on the interpretation of the factor which is based on the choice of models cantilevered by the factor/scale correlations and light tests. The results were evaluated using the instructions of Comrey (2013). Factor loads exceeding 72 (51% overlapping variance) were accepted excellent ,62 (41% overlapping variance) as very good and 55 (30%

overlapping variance) as well. Factor loads, entries or scales below .55 were considered to be false if only one factor was associated.

RESULTS

Factor Analysis and Internal Consistency

For suitability of the sampling, we examined the KMO and Bartlett's test of sphericity values. KMO sampling index was calculated as 0.889 by SPSS. Also, Bartlett's test of sphericity was significant at $p < 0.0001$ with chi-square value 520.152 ($n = 538$). Table 2 shows the results of inner consistency, reliability and factor analysis outcome in circumstance. The ISL items use 5 points Likert scale with responses ranging from "strongly disagree" to "strongly agree". Material analysis consisting of 8 items and a rigorous scale with an alpha coefficient of .87 were produced. Inter-item item-scale correlations $r =$ range between .52 and .77. The basic component analysis was applied and made a single-factor resolution as anticipated (e.value = 4.468, 57% of the explained variance). Among 8 items, factor loads vary between .62 and .85.

Table 2. ISL Scale Reliability and Factor Analysis

Item	Factor Loading	Mean Item-Total Correlation
Q1: I know which application to use on the computer for the task I have.	.76	.67
Q2: I have previously used an information system (e-government, health, banking, etc.).	.81	.72
Q3: I can choose the right information system for business areas.	.79	.71
Q4: I have the skills needed to evaluate information systems.	.82	.74
Q5: I work on an information system in my daily work life.	.85	.77
Q6: I know how to use information systems for it to help me.	.72	.63
Q7: When I encounter a problem on the information system, I can resolve it.	.62	.52
Q8: I do not hesitate to use an information system even if I haven't used it before.	.67	.57

Variance accounted for = 57%

Coefficient alpha = .87

For ISL scale test – retest reliability was calculated by using Pearson product moment correlation scores. A standard regression model was used using in-class correlation. ISL scale scores, between ISL administrations, showed a small correlation ranging from $r = .48$ to $.67$. In-class correlation between different scores was .48 and this suggests that ISL has a low stability over time.

The baseline levels of ISL were higher among males ($t_{726} = 2.236, P = .026$). Age was not a predictor information literacy scores at any time. There was no significant relationship between ISL and overall use of information technology ($P = .05$). The levels of ISL were not profession or age-dependent, but were very significant for daily users.

DISCUSSION

Information systems literacy is defined as the ability to use information systems in all kinds of the digital environment in today's technology. The internal consistency scores of ISL and moderate test-retest reliability show this it is useful to examine this type of literacy to assess both history and to interpret the results of information system literacy intervention. Although there are tools that enable consumers to critically evaluate the sources of information systems (Koivisto and Hamari, 2019, Chu et. Al., 2018), ISL took its place among the tools that evaluate consumers' skills on using information systems in general. In fact, in the information

systems literacy model (e.g., science literacy, information literacy), there are relatively few approved measures for most important literacy conditions (Hatleviket. al., 2018:1-6, Guo and Goh 2016:3, Probert 2009:5). That is why the next studies should study the links between pick up skills, information system usage, and information system usage behavior and results of use. Many of these literacy tools suppose major time facilities to manage and analyze. ISL is intended for simple, easy application and can, therefore, be used on its own.

ISL promotion takes place in a broader context of learning, so it is meaningful to improve partners with distinct groups working in other literacy sectors to enable ISL to be approved for other literacy, social functioning, organizational performance, efficiency, technology use, and welfare measures. Different institutions within the state, private sector - state difference, the person-institution relationship can be given as examples. This can bring together literacy groups to address systemic literacy problems. Such partnerships highlight the common difficulty in research, development and capacity building for policy advocacy.

Limitations and Opportunities for Further Research

Additional studies are required to study the correlations that are less modest than expected in light of ISL under conditions that are not sensitive to the impact of a specific intervention. Testing ISL with a population with a high IT rate imposes a limitation; however, it also offers the occasion to understand the strength of a precaution in a given population. Further research should take into account the application of ISL to more populations and also to groups with variable levels of technology knowledge. ISL measures not the actual skills but the perceived skills of the users and their self confidence in using information systems. Therefore, it is very important to continue the study.

Conclusions

The need to research, evaluate and apply data regarding what is learned or wanted with the use of information systems is common among age, gender and cultural groups and therefore the applicability of ISL as a standard assessment tool for information systems literacy is very high. Assessing the comfort level of information systems users allows us to identify any gaps in ability and also helps those with a low level of comfort to benefit from the potential advantages of information systems. This action could support the development of tools that can meet these needs and help create appropriate strategies for the removal of the digital gap between users. Only by increasing the understanding of inequality between existing information systems tools and the ability of users to use them, it is possible to take necessary steps to eliminate them.

Conflict Of Interest

The author declares that he has no conflict of interest.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

REFERENCES

- Probert, E. (2009). Information literacy skills: Teacher understandings and practice. *Computers & Education*, 53(1), 24-33.
- Guo, Y. R., & Goh, D. H. L. (2016). Evaluation of affective embodied agents in an information literacy game. *Computers & Education*, 103, 59-75.
- Hatlevik, O. E., Throndsen, I., Loi, M., & Gudmundsdottir, G. B. (2018). Students' ICT self-efficacy and computer and information literacy: Determinants and relationships. *Computers & Education*, 118, 107-119.
- Chu, X., Luo, X. R., & Chen, Y. (2018). A systematic review on cross-cultural information systems research: Evidence from the last decade. *Information & Management*.
- Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research. *International Journal of Information Management*, 45, 191-210.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Englewood Cliffs, New Jersey.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman, NY.
- Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, 57(2), 218-259.
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2012). Defining twenty-first century skills. In *Assessment and teaching of 21st century skills* (pp. 17-66). Springer, Dordrecht.
- Calvani, A., Fini, A., Ranieri, M., & Picci, P. (2012). Are young generations in secondary school digitally competent? A study on Italian teenagers. *Computers & Education*, 58(2), 797-807.
- Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis*. Psychology Press.
- Ferrari, A., Brečko, B. N., & Punie, Y. (2014). DIGCOMP: A framework for developing and understanding digital competence in Europe. *eLearning Papers*, (38), 1.
- Fraillon, J., Ainley, J., Schulz, W., & Friedman, T. (2014). *Preparing for life in a digital age: The IEA International Computer and Information Literacy Study international report*. Springer.
- Fraillon, J., Schulz, W., & Ainley, J. (2013). *International computer and information literacy study: Assessment framework*.
- Horton, F. W. (2008). *Understanding information literacy: A primer*. Paris: UNESCO
- Kurbanoglu, S. S. (2010). Bilgi okuryazarlığı: Kavramsal bir analiz. *Türk Kütüphaneciliği*, 24(4), 723-747.
- Mioduser, D., Nachmias, R., & Forkosh-Baruch, A. (2008). New literacies for the knowledge society. In *International handbook of information technology in primary and secondary education* (pp. 23-42). Springer, Boston, MA.
- Moos, D. C., & Azevedo, R. (2009). Learning with computer-based learning environments: A literature review of computer self-efficacy. *Review of Educational Research*, 79(2), 576-600.
- Norman, C. D., & Skinner, H. A. (2006). eHealth literacy: essential skills for consumer health in a networked world. *Journal of medical Internet research*, 8(2).
- Pinto, M., Cordon, J. A. ve Diaz, R. G. (2010). Thirty years of information Literacy (1977–2007): A terminological, conceptual and statistical analysis *Journal of Librarianship and Information Science* 42(1), 3-19.
- Snaveley, L. ve Cooper, N. (1997). The information literacy debate. *The Journal of Academic Librarianship*, 23(1), 9-13.
- Zhong, Z. J. (2011). From access to usage: The divide of self-reported digital skills among adolescents. *Computers & Education*, 56(3), 736-746.
- Zurkowski, P. G. (1974). *The information service environment: relationships and priorities*. (Report ED 100391). Washington DC: National Commission on Libraries and Information Science.