

Levels of Information Literacy and its Influence in Reciprocal Teaching in Communication Sciences Students

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Abstract

This quantitative basic research was a cause-effect correlational design, where the instruments results for information literacy and reciprocal teaching were ,987 and ,992 through the Cronbach's Alpha. The validation of the instruments was carried out by 3 expert judgment and the population was composed of 249 communication science students of a private university in Lima, Perú. Through the multinomial logistic regression was statistically verified that the predominant level in the dimension of information literacy (sourcing, evaluating and managing information) in a 90% are at level 3 according to the DigComp 2.1 scale; nevertheless, the expectation for the Communication Sciences Program was they managed to achieve a higher level in the evaluating information dimension considering their training should be oriented towards information assurance, showing the necessity to strengthen the development of these competences.

Keywords

Information Literacy, Reciprocal teaching, Digital Development, Participative strategies.

1. Introduction

The current development of technology has revolutionized human activity in every aspect, where Information and Communications Technology (ICT) have become instruments and resources transforming the way people and society communicate, providing interconnection, immateriality, proximity, multimodality and diversity to the communication process [1], also integrating to all activities of society daily life, being many of them conditioned to have the systems that allow their development so they can be provided at a certain point, such as political activities which depend on an Internet connection [2].

The digital literacy is connected with the society development due to the connection of learning cognitive elements with Internet, which is important to develop practices that foster information and content problem solving in digital environments [3]. Due to the above, the information literacy become important in the academic field because of the need to know the information in its different aspects going from how, what, when, why and the purpose of the information is required for in people's activity, becoming an important help in educational process for students and teachers, subject matter experts and education authorities [4]. On the other hand, the advance of technology favors the information literacy achievement due to internet provides the access facility breaking barriers of time and space, a characteristic we should take in advantage of.

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UNESCO highlighted the fact that information literacy is related to the universal human right to access, receive, critically evaluate. Create, use and spread multimedia information and content in every possible way [5]. DigComp 2.1 stated that information literacy is the set of skills that people acquire to access, filter, evaluate and manage the elements linked to information, establishing 8 levels of these competencies' development [6].

Digital competence is defined as the people capacity to apply skills and knowledge on the various elements provided by the ICTs to carry out their activities from the personal to the professional sphere [7]. In people's training, it allows to improve the prospects in today's social sphere such as employability, politics, economy and entertainment [8]. The development of digital competencies becomes important in aspects related to educational technology covering a lot of activities such as learning, research, recreation, social and more activities [9]. In the same way, this is very useful to promote knowledge, attitudes and processes by facilitating the comprehension of contents and production of innovation in students [8].

The technological developments are occurring at such a dizzying way that the usage and management of competencies development in the educational field, is still lagging behind which is something important to reduce with the government participation in order to implement State policies and a private initiative to promote their development and massification at all levels. Therefore, it's necessary to identify and measure the development of student's digital competencies for decision making in order to reduce the gap existing in their personal development compared to the expectations required for the achievement of learning, even more at the current situation where digital environments are highly required.

Due to the current sanitary situation of Covid-19 which has been affecting many activities at all levels in the world creating the isolation, it has been observed that students of the Communication Science school of a private university located in Los Olivos district, Lima province, Peru, do not have an adequate level of development in digital skills despite the fact that they are considered as digital natives since they show an inappropriate handling of communication. Computer solving problem skills and information management, showing difficulties to develop academic activities. Therefore, this investigation had as general objective to determine the relation between digital competencies, specifically in terms of information literacy and reciprocal teaching in communication science students of a private university in Lima.

1.1. Information Literacy

The term information literacy was coined by Paul Zurkowski in 1974 [10]. It means the attributes of the individual whereby this person can be able to locate, recognize, evaluate and effectively employ the information required [11]. This is related to the universal human right to have information, where citizens can access, receive, critically evaluate, create, use and disseminate multimedia information and content in every possible way [5].

Information literacy is defined by the set of skills that people have to surf, search, filter, evaluate and manage information, illustrated ion structure shown by DigComp 2.1 [6] and INTEF 2017 [20], classifying them in 8 levels in a staggered way with criteria from less to more complex achievement of competencies as shown in Table 1.

Table 1.

Main keywords that feature the proficiency levels.

Level in DigComp 1.0	Level in DigComp 2.1	Complexity of tasks	Autonomy	Cognitive Domain
Foundation	1	Simple tasks	With guidance	Remembering
	2	Simple tasks	Autonomy and with guidance where needed.	Remembering
Intermediate	3	Well-defined and routine	On my own.	Understanding

		tasks, and straightforward problems		
Advanced	4	Tasks and well-defined and non-routine problems	Independent and according to my needs.	Understanding
	5	Different tasks and problems	Guiding others.	Applying
	6	Most appropriate tasks	Able to adapt to others in a complex context.	Evaluating
Highly specialized	7	Resolve complex problems with limited solutions	Integrate to contribute to the professional practice and to guide others.	Creating
	8	Resolve complex problems with many interacting factors	Proposing new ideas and processes to the field.	Creating

Source: DigComp 2.1

Information literacy is made up of three competencies [6] related to develop skills associated to information access, search, evaluation and management and which focus on the following dimensions: 1) Surf, research and filter information: ability to search and identify what information is needed, access to such information; 2) Evaluate information: ability to analyze, compare, evaluate and interpret critically the information, reliability and seriousness of information resources and; 3) Manage information: ability to organize, store, recover and process the information in simple or structured digital environments

The aforementioned dimensions complement each other to produce a set of competencies in information processing that will be useful in work and academic activities development. These dimensions are structured in 8 levels according to DigComp 2.1, evolving since the Level 1 basic stage (Basic 1) to the Level 8 (Specialized 2), moving between intermediate levels as they increase to reach a higher level. The first step depends on a guide oriented to search, surf, filter and manage information; then activities are carried out with some autonomy; to another where is exposed and explained the information needs and showed how to access to the content; it will be able to adapt the most appropriate search strategies and access to contents; and it will manage to instruct other people in the process of searching, filtering and managing information, to end developing the ability to propose and implement innovations related to the search, filtering and management of information [6].

1.2. Reciprocal teaching

Reciprocal teaching appeared in 1984 as a process to reduce the gap in reading comprehension, where the teacher provided the scaffolding and a means to peer-to-peer collaborative learning [12]. In reciprocal teaching, teacher and students change leader roles in the academic session; the teacher support students as they learn to lead discussions and pose their own questions [13]. The objective in such an interaction is getting students to personalize and internalize the use of problem-solving strategies jointly, encouraging an autonomous learning based on the interaction among peers in order to share the knowledge.

That method adopted the principles of active learning, helping students with appropriate learning strategies, encouraging collaborative learning, giving feedbacks and recognition of team performance, negotiating rules and initiating the reflection process [14]. Systematic cooperation between teacher and students allows achieving a better result in a collaborative environment than doing it independently; and in a way this form of instruction is relevant to students' mental development and reflective awareness [15]. This makes reciprocal teaching to be considered as a participatory teaching style.

Reciprocal teaching emphasizes the collaboration and dialog in class where collaborating is a concern in the application of teaching-learning models, allowing students to support and cooperate each other in order to complete tasks through the process, collaborating in the material analysis in small

groups or in discussions, assisted by a mutualism in learning, where students assume responsibility regardless of the success of the process.

In accordance to the mentioned before, students must be trained to learn from their partners through group activities with the aim to improve several cognitive skills because of the capacity to interact in a social environment is one of the main components of interpersonal intelligence [10].

The aspects linked to reciprocal teaching referred to in this study comprise enhanced skills and promoted attitudes. Skill is understood as knowing how to perform something in practice or with the technique, being able to be individually, in addition to being specific or interrogatives when complex situations are taking place [16]. The attitude is the tendency or predisposition to evaluate an object or situation in a certain way and that starts from the particular beliefs of the same, leading the individual to act for or against the object or situation, as a result of all evaluation [17].

2. Methodology

This quantitative basic research was a cross-sectional descriptive study with a non-experimental design. The population analyzed was composed by 249 Communication Science students. Data collection was indirect using the survey as an instrument through a digital questionnaire designed in Google Form. The instrument was elaborated adapting the list of skills described in INTEF 2017 [20] about the teacher's approach to students' activities and principles of DigComp 2.1 [6], with a total of 100 questions with Likert scale (range de 0 – 9, being 9 the maximum rating for a development of the skill).

The measurement instrument fulfilled with reliability criteria by obtaining the same results in a sample of 30 cases being the validation of the content made by the judgment of 3 experts in methodology. The reliability of the instrument was established by means of the Cronbach's Alpha obtaining the values of ,987 for Information literacy and ,992 for reciprocal teaching. In the statistics analysis, to get the data normality the Spearman's Rho correlational coefficient was applied to establish the correlation between both variables and in order to determine the level of influence, the Multinomial Logistic Regression coefficient was applied, being all processed by the SPSS version 25 program.

3. Results

The descriptive analysis of the data shown in Table 2, exhibits that the segmentation of the levels of the information literacy dimensions is concentrated in Level 3, for the general value of the variable and for each dimension. From the table, it can be seen that 90% of the cases achieve Level 3 and the remaining 10% are distributed between Level 4 and Level 5, evidencing that there are significant elements that can restrict the development towards higher levels.

Table 2.
Concentration of cases for digital literacy.

Level of competence	%	% Accumulated
Level 3	90%	90%
Level 4	1%	91%
Level 5	9%	100%
Total	100%	

Table 3 shows the results for reciprocal teaching, where the development of enhanced skills and promoted attitudes in this teaching-learning method, are concentrated in the medium level (43% and 40%) and with a relative tendency towards the high level (34% and 38%); however, the percentages of the low level (22% and 20%) show that a significant group of students did not achieve to develop these skills and attitudes properly.

Table 3.
Distribution of the development levels of reciprocal teaching activities.

Level of development of activities	Percentages	
	Skills	Attitudes
Low	22%	22%
Middle	43%	40%
High	34%	38%
Total	100%	100%

Table 4 shows the calculation of Spearman's rank correlation coefficient for information literacy and reciprocal teaching. The value obtained from this coefficient was .372 (significance of $p=0.000$) so this explains the existence of a positive correlation, low but significant correlation between the aspects indicated.

Table 4.
Spearman's rank correlation coefficient.

		Reciprocal teaching
Information literacy	Spearman's Rank correlation coefficient	0.372
	Sig. (p)	0.000
	N	249

Table 5 shows the calculation of multinomial logistic regression coefficients, with the level of information literacy in the skills to navigate, search and filter information, which predominates in the activities of reciprocal teaching. The values show that, in the crossings of Level 3, the values of significance (Sig.) have the lowest result (Medium=,001 and High=,001); the result of B has the highest values (High=1,686 and Medium=1,504), showing that Level 3 has the highest predominance; the values of odds ratio "Exp(B)" have values of High=5.4 and Medium=4.5, which meaning that students are more likely to achieve information literacy and develop reciprocal teaching at the High level at 5.4 times and Middle level 4.5 times. Accordingly, it was determined that Level 3 is the predominant one; however, the data should be considered to indicate that students are less likely to achieve better reciprocal teaching development if they do not achieve a greater development of information literacy for navigating.

Table 5.
Multinomial logistic regression coefficient of the level for the Navigate dimension of information literacy in reciprocal teaching.

Navigate (*) / Reciprocal Teaching	B	Error Desv.	Sig.	Exp(B)	95% I.C. for Exp(B)		
					L. limit	U. limit	
Level 3	Middle	1.504	0.451	0.001	4.500	1.858	10.899
	High	1.686	0.487	0.001	5.400	2.080	14.022

Source: Database. $R^2=0.26$ (Cox and Snell), 0.28 (Nagelkerke). (*) Navigate, search, and filter

Table 6 shows the calculation of the level of information literacy in the skills to evaluate information that predominates in the reciprocal teaching activities of students. The values show that, at the crossing of Level 3, the significance value (Sig.) has the lowest result (Medium=,000 and High=,000); the result of B is the highest (High=2,128 and Medium=2,079); these coefficients determine that Level 3 is the one that predominates in students, which is below expectations because the hypothesis was that Level 4 would predominate.

Table 6.
Logistic regression coefficient of the level for the dimension Evaluate of the information literacy in reciprocal teaching.

Evaluate / Reciprocal Teaching	B	Desv Error.	Sig.	Exp(B)	95% I.C. for Exp(B)	
					L. limit	U. limit

Level 3	Low	2.037	0.614	0.001	7.667	2.302	25.534
	Middle	2.079	0.433	0.000	8.000	3.424	18.693
	High	2.128	0.473	0.000	8.400	3.323	21.231

Source: Database. R2= 0.52 (Cox and Snell), 0.59 (Nagelkerke).

Table 7 shows the calculation of information literacy levels in the management skills of information predominating in reciprocal teaching activities. The values show that at the crossing of Level 3, the significance value (Sig.) has the lowest result (Low=,001, Medium=,000 and High=,000); the results of B are the highest (Low=2,037, Medium=2,120 and High=2,104); showing that Level 3 is the one that predominates in students; the odds ratio values "Exp(B)" are Low=7,7, Medium=8.3 and High=8.2 showing that students have more possibilities to achieve the Medium level by 8.3 times, High by 8.2 times and Low by 7.7 times. From the table, it can be seen that Level 3 is the one that predominates in students, and there is a slight tendency towards higher levels.

Table 7.

Logistic regression coefficient of the level for the dimension Management of information literacy in reciprocal education

Management / Reciprocal Teaching	B	Desv. Error	Sig.	Exp(B)	95% I.C. for Exp(B)		
					L. limit	U. limit	
Level 3	Low	2.037	0.614	0.001	7.667	2.302	25.534
	Middle	2.120	0.432	0.000	8.333	3.573	19.435
	High	2.104	0.474	0.000	8.200	3.240	20.750

Source: Database. R2= 0.71 (Cox and Snell), 0.76 (Nagelkerke).

4. Discussion

The concentration of 90% in Level 3 of information literacy in general aspect and the results for each of the 3 dimensions (Navigate, filter and manage information) that show a development up to Level 3, concordant with The information and information literacy area of the digital teaching competence [11], where the average overall achievement of these competencies reaches a level of 3.2 out of a total of 6.0, and in the dimensions they reach 3.3, 2.9 and 3.4, respectively. This suggests that the scenario for the development of these competences is similar between the students of the Peruvian and Spanish universities; and making use of similar schemes in the evaluation (DigComp) the same patterns are obtained, although in the dimension of Evaluate, in this research, a better result is obtained.

The dimension Evaluate information is related to the capacity of critical analysis of content. It is considered that the students must reach a higher level of development, because these professionals are oriented to communication and their main characteristics is being reliable, avoiding and combating the spread of disinformation and fake news in the media and social networks as indicated in the fake news and generation z journalists. Post-millennial solutions against disinformation [18]; however, by showing that they only achieve a level 3 of a total of 8 levels, it is evident that it would not be possible to adequately train a communicator, from the university study plan and the students' own participation.

When it is determined that Level 3 predominates, out of a total of 8 levels established by DigComp 2.1, the conclusion of Information Literacy (ALFIN) in the teaching of natural sciences in flexible models of secondary education for adults [19] is confirmed: the levels achieved are not related to the generalized concept of the skills of the so-called "digital natives", of whom a greater familiarization and a high level of development of these competences is expected by the simple fact of being in the age range, concluding that this development is achieved after a learning process and a transversal methodology, rather than by a simple spontaneous emergence of the use of technologies of those who have been born in the context of the development of ICTs.

The enhanced skills and attitudes promoted in reciprocal teaching are concentrated in the medium-low levels with 65.5%, which suggests that 2/3 of the students do not take full advantage of the potential represented by this method, these values take distant from the results of The effect of reciprocal instructional models and interpersonal intelligence on the student learning outcomes of social science

education [10], where they show that it improves the development of interpersonal intelligence by strengthening skills such as collaboration, critical analysis, explanation, summary and prediction of content; as well as, positive attitudes such as cooperation, problem solving, leadership, self-motivation, social relations and self-regulation. The distance in the results obtained in this research, suggests that the university does not promote this type of teaching-learning methods or that it is not understood by teachers when they are applied.

5. Conclusions

Based on the results, there are strong evidences that curricular planning, teacher competencies and its training, need to improve applying a transversal and integrative approach throughout the career, in order to take advantage of the permanent development of ICT and the increasing digitalization in education, moving from a passive attitude in the competencies formation to a much more active one, searching to get better professionals profile formed at the university.

University should rethink the developing curriculum, as well as the evaluation and level of competencies required from its teachers, making a new planning for the curriculum development considering all changes produced by Covid-19, with the massive digitalization of processes and the greater need to strengthen these digital competencies in all people which interact with university community, such as teachers, students and administrative staff, stressing information literacy among all of them.

Also, investigation offers an approach to reality and current indicators of information literacy and reciprocal teaching from students of a Peruvian university in Lima, and as a starting point for further research from other studies to further in the analysis of curriculum factor that would help the digital competencies levels, being some of them information literacy, technological resources availability, teachers competencies level and commitment of universities or habits to interact with technology.

6. References

- [1] Grande, M., Cañón, R., & Cantón, I. (2016) Tecnologías de la información y la comunicación: Evolución del concepto y características. *International Journal of Educational Research and Innovation*, 6, 218–230.
- [2] Espinosa, A. Profesores “migrantes digitales” enseñando a estudiantes “nativos digitales.” *Medisur*, 15 (4), 463–473.
- [3] Matamala, C. (2018). Desarrollo de alfabetización digital ¿Cuáles son las estrategias de los profesores para enseñar habilidades de información?. *Perfiles Educativos*, 40(162), 68-85. <https://doi.org/10.22201/iisue.24486167e.2018.162.58846>
- [4] González-Rojas, Yineida, & Triana-Fierro, Dairo Alberto. (2018). Actitudes de los docentes frente a la inclusión de estudiantes con necesidades educativas especiales. *Educación y Educadores*, 21(2), 200-218. <https://doi.org/10.5294/edu.2018.21.2.2>.
- [5] Muratova, N., Grizzle, A., & Mirzakhmedova, D. (2019) Media and Information Literacy in Journalism. UNESCO (2019).
- [6] Carretero, S., Vuorikari, R., & Punie, Y.: DigComp 2.1: The Digital Competence Framework for Citizens. With eight proficiency levels and examples of use. Luxembourg: Publications Office of the European Union (2017) 1–48.
- [7] Iordache, E., Mariën, I., & Baelden, D. (2017). Developing Digital Skills and Competences: A Quick-Scan Analysis of 13 Digital Literacy Models. *Italian Journal of Sociology of Education*, 9(1), 6-30. doi: 10.14658/pupj-ijse-2017-1-2.
- [8] Marzal, M. y Cruz, E. (2018). Gaming como Instrumento Educativo para una Educación en competencias Digitales desde los Academic Skills Centres. *Revista General de Información y Documentación*, 28(2), 489-506. Doi: <http://dx.doi.org/10.5209/RGID.60805>
- [9] Levano-Francia, L., Sanchez Diaz, S., Guillén-Aparicio, P., Tello-Cabello, S., Herrera-Paico, N., & Collantes-Inga, Z. (2019). Competencias digitales y educación. *Propósitos y Representaciones*, 7(2), 569-588. doi: <http://dx.doi.org/10.20511/pyr2019.v7n2.329>

- [10] Abas, M., Solihatin, E., & Nadiroh. (2019) The effect of reciprocal instructional models and interpersonal intelligence on the student learning outcomes of social science education. *International Journal of Engineering and Advanced Technology*, 8(5), 427–433.
- [11] Moreno-Guerrero, A., Miaja-Chippirraz, N., Bueno-Pedrero, A., & Borrego-Otero, L. (2020). The Information and Information Literacy Area of the Digital Teaching Competence. *Revista Electrónica Educare*, 24(3), 1-16. <https://doi.org/10.15359/ree.24-3.25>.
- [12] Boamah, N. A. Reciprocal teaching of comprehension-fostering and monitoring strategies in an ESL setting in Ghana. Ohio University (1997)
- [13] Martínez, E. S., Díaz, N., & Rodríguez, D. E. (2011) The Assistance Framework in Reading Comprehension Processes for University Students. *Educación y Educadores*, 14(3), 531–556. <https://doi.org/10.5294/edu.2011.14.3.5>
- [14] Rebollo, Á., García, R., Buzón, O., & Barragán, R. (2012) Las comunidades virtuales como potencial pedagógico para el aprendizaje colaborativo a través de las TIC. *Enseñanza & Teaching: Revista Interuniversitaria de Didáctica*, 30, 105–126.
- [15] Escallón, E., González, B. I., Peña, P. C., & Rozo, L. J. Implicaciones Educativas de las Teorías de Vygotsky: el Desarrollo de Conceptos Científicos en Estudiantes Bogotanos. *Revista Colombiana de Psicología*, 28(1), 81–98. <http://dx.doi.org/10.15446/rcp.v28n1.68020>.
- [16] Torres, C. M. (2017) Educación por habilidades: Perspectivas y retos para el sistema educativo. *Revista Educación*, 41(2)1–13. <https://doi.org/http://dx.doi.org/10.15517/revedu.v41i2.21719>.
- [17] Andrade-Valles, I., Facio-Arciniega, S., Quiroz -Guerra, A., Alemán-de la Torre, L., Flores-Ramírez, M., & Rosales-González, M. (2018). Actitud, hábitos de estudio y rendimiento académico: Abordaje desde la teoría de la acción razonada. *Enfermería universitaria*, 15(4), 342-351. <https://doi.org/10.22201/eneo.23958421e.2018.4.533>.
- [18] García-Marín, D. (2021). Las fake news y los periodistas de la generación z. Soluciones post-millennial contra la desinformación. *Vivat Academia*, 37–63. <https://doi.org/10.15178/va.2021.154.e1324>
- [19] Cardona, P., Hernández, P., López, P., & Murcia, E. (2021). Alfabetización informacional (ALFIN) en la enseñanza de las ciencias naturales en modelos flexibles de educación media para adultos. *Ocupaciones pedagógicas en clave del desarrollo humana*. 197-213.
- [20] INTEF. (2017). Marco común de Competencia Digital Docente. Enero 2017, 1–71.