Reciprocal teaching influenced by information literacy levels in students of Communication Sciences

Enseñanza recíproca influenciado por los niveles de alfabetización informacional en estudiantes de Ciencias de la Comunicación

通信科学专业学生信息素养水平对互惠教学的影响

Взаимное обучение в зависимости от уровня информационной грамотности студентов коммуникационных наук

Guillermo Ocrospoma
University of Cesar Vallejo
gocrospoma@ucv.edu.pe
https://orcid.org/0000-0003-4029-3920

Doris Fuster-Guillén
National University of San Marcos
dfusterg@unmsm.edu.pe
https://orcid.org/0000-0002-7889-2243

Yolvi Ocaña-Fernández
National University of San Marcos
yocanaf@unmsm.edu.pe
https://orcid.org/0000-0002-2566-6875

Klinge Orlando Villalba-Condori
Continental University (Perú)
kvillalba@continental.edu.pe
https://orcid.org/0000-0002-8621-7942

How to Cite this Paper · Cómo citar este trabajo

Ocrospoma, G., Fuster-Guillén, D., Ocaña-Fernández,Y., & Villalba-Condori, K. O. (2023). Reciprocal teaching influenced by information literacy levelsinstudentsofCommunicationSciences.*Publicaciones,53*(2),141–155. https://doi.org/10.30827/publicaciones.v53i2.26819

Abstract

Introduction: the current technological development transcends all human activity, such as education. Analyzing the link of digital skills achieved by students, applied in collaborative teaching methods, we established the existing relationship between information literacy (IL) and reciprocal teaching (RT) skills in Communication Sciences students; based on the classification of IL competencies in DigComp 2.1, related to skills and attitudes promoted by RT.

Method: the research was anonymized, a digital questionnaire was used with 100 IL questions and 22 RT questions, both with a Likert scale with values of 0-9; the reliability of the instrument was validated by Cronbach's Alpha with values of .987 for AI and .992 for RT, as well as the review at the discretion of 3 experts.

Results: the data showed a non-normal distribution, applying Spearman's Rho it was determined that there is a significant relationship, establishing through Multinomial Logistic Regression that the IL of level N3 predominates, concentrating 90% of cases, reflected in the 2/3 of RT concentrated in levels Low-Medium, the regression coefficients show that the low development of IL does not lead to an advanced RT.

Conclusions: In Peru, the development of Digital Competencies, fundamentally the 3 dimensions of IL (navigate, evaluate and manage information), is similar to Spain, being that, evaluating it must have greater development to ensure that communicators can combat fake news, a level N3 would be insufficient, a review of the university curriculum and improving student training would be needed to achieve it, because being "digital natives" is not enough.

*Keywords: I*nformation literacy, reciprocal teaching, digital competences, *fake news.*

Resumen

Introducción: el actual desarrollo tecnológico trasciende toda actividad humana, como la educación. Analizando la vinculación de competencias digitales logradas por los estudiantes, aplicados a métodos de enseñanza colaborativos, establecimos la relación existente entre competencias de alfabetización informacional (AI) y enseñanza recíproca (ER) en estudiantes de Ciencias de Comunicación; basada en la clasificación de competencias de AI en DigComp 2.1 relacionadas con habilidades y actitudes promovidas por la ER.

Método: la investigación fue anonimizada, se utilizó un cuestionario digital con 100 preguntas de AI y 22 preguntas de ER, ambas con escala de Likert con valores de 0-9; la fiabilidad del instrumento validado mediante Alfa de Cronbach con valores de .987 para AI y .992 para ER, así como la revisión a juicio de 3 expertos.

Resultados: los datos mostraron una distribución no normal, aplicando Rho de Spearman se determinó que existe relación significativa, estableciendo mediante Regresión Logística Multinomial que la AI de nivel N3 predomina, concentrando el 90% de casos, reflejado en los 2/3 de ER concentrados en niveles Bajo-Medio, los coeficientes de regresión evidencian que el bajo desarrollo de AI no conducen a un ER avanzado.

Conclusiones: en Perú, el desarrollo de las Competencias Digitales, fundamentalmente las 3 dimensiones de AI (navegar, evaluar y gestionar información), es semejante a España, siendo que, evaluarla debe tener mayor desarrollo para lograr que los comunicadores puedan combatir las fake news, un nivel N3 sería insuficiente, se necesitaría una revisión de la curricula universitaria y mejorar la formación estudiantil para lograrlo, porque ser "nativos digitales" no basta.

Palabras clave: Alfabetización informacional, enseñanza recíproca, competencias digitales, *fake news*.

Аннотация

Введение: современное технологическое развитие охватывает все виды человеческой деятельности, в том числе и образование. Анализируя связь цифровых компетенций, достигнутых студентами, с методами совместного обучения, мы установили взаимосвязь между компетенциями информационной грамотности (AI) и взаимным обучением (ER) у студентов коммуникационных наук; на основе классификации компетенций IL в DigComp 2.1, связанных с навыками и отношением, способствующими ER.

Метод: исследование было анонимным, использовался цифровой вопросник со 100 вопросами AI и 22 вопросами ER, оба со шкалой Likert со значениями от 0-9; надежность инструмента была подтверждена с помощью Cronbach's Alpha со значениями .987 для AI и .992 для ER, а также проверена на основании оценки трех экспертов.

Результаты: данные продемонстрировали отсутствие нормального распределения, с помощью Rho Спирмена было определено, что существует значимая связь, установив с помощью мультиномиальной логистической регрессии, что преобладает AI уровня N3, концентрируясь в 90% случаев, что отражается в 2/3 ER, концентрирующихся в Low-Medium уровнях, коэффициенты регрессии показывают, что низкое развитие AI не приводит к продвинутому ER.

Выводы: в Перу развитие цифровых компетенций, в основе которых лежат три измерения AI (навигация, оценка и управление информацией), схоже с Испанией, хотя оно нуждается в дальнейшем развитии, чтобы коммуникаторы могли бороться с фальшивыми новостями, уровня N3 будет недостаточно, для этого необходимо пересмотреть университетскую учебную программу и улучшить подготовку студентов, поскольку быть "носителями цифровых технологий" недостаточно.

Ключевые слова: информационная грамотность, взаимное обучение, цифровые навыки, фальшивые новости.

摘要

引言：当前的技术发展超越了所有人类活动，例如教育。我们通过分析学生获得的数字技能的联系及应用于协作教学方法，建立了通信科学学生的信息素养技能（AI）和互惠教学（RE）之间的关系。该关联基于 DigComp 2.1 中与 RE 提倡的技能和态度相关的 AI 能力分类。

研究方法：本研究为匿名研究，采用数字问卷，包含100个AI问题和22个RE问题，均采用李克特量表，取值为0-9；通过 Cronbach's Alpha 验证的工具的可靠性，AI 为 0.987，RE 为 0.992。此外，该问卷经过了 3 位专家的审评。

研究结果：数据呈非正态分布，应用Spearman's Rho确定存在显着关系，通过多项Logistic回归确定N3级AI占优势，集中了90%的案例，体现在2/3 在中低水平的集中 RE 中，回归系数表明低水平 AI 发展不会导致水平 RE。

结论：在秘鲁，由人工智能的 3 个维度（浏览、评估和管理信息）组成的数字能力的发展与西班牙相似。对其评估必须得到更大的发展，以确保传播者能够打击假新闻。N3 水平是不够的，仅仅成为"数字原住民"也是不够的，因此我们需要对大学课程进行审评并改进对学生的培训。

关键词：信息素养，互惠教学，数字技能，fake news.

Introduction

The current development of technology has revolutionized human activity in every respect. Information and Communication Technology (ICT) has become a resource and a tool to transform society and the way people communicate, contributing to the communication process elements such as connectivity, closeness, virtuality and a variety of ways (Grande et al., 2016). It also integrates into all the activities of human society, to an extent that the existence and development of these technological systems currently condition the provision of many services, an example of this are the digital activities in politics, as they depend on Internet access (Espinosa, 2020).

IL is linked to the development of society when the cognitive elements of learning are connected to Internet, and it is important to develop practices that favor the solution of information problems and contents in a digital environment (Matamala, 2018). This supports that IL is growing in importance in the academia due to the need to be aware of the information in its various aspects, from the how, what, when, why and for what it is required; information is essential to all the agents in education, students, educators, teachers, specialists and authorities (González-Rojas & Triana-Fierro, 2018). The development of Internet and the progress of technology also favors the development of IL when barriers such as those of time and space as broken, and are aspects that must be leveraged.

The United Nations Educational, Scientific and Cultural Organization (Unesco) emphasizes that IL is indissolubly linked to universal human rights, including the access, and to receive and evaluate it in a critical manner, being able to create, use and distribute it in the best possible way (Muratova et al., 2019).

DigComp 2.1 establishes eight levels of progress for the IL skillset that people develop in the access, filtering, evaluation and management of information (Carretero et al., 2017).

Digital competence is defined as the personal or professional capability of individuals to apply the skills and knowledge of the elements provided by the ICT (Iordache et al., 2017). At the individual level, the training in social aspects such as economy, politics and employability or entertainment represents a significant improvement (Marzal & Cruz, 2018). It is important to develop digital competences applied to educational technology in activities such as learning, research, entertaining, social and other activities (Levano-Francia et al., 2019). At the same time, this allows fostering knowledge, attitudes and processes, to promote the understanding of contents and inspire students to innovate (Marzal & Cruz, 2018).

The development of technology is taking place at such a dizzying pace, in contrast with its use and management for the development of educational competences, that the latter still falls behind, and it is of utmost importance that the government has an active participation in bridging the gap, promoting its development and popularization at all levels by deploying nationwide policies and private sector initiatives. In this context and in order to offer an appropriate decision-making intended to close the gaps in the development of the digital competences of the students, it is necessary to identify and measure the level of progress of its self-development, faced with the expectations for academic success, influenced by the digital environments currently required.

Due to the current health situation created by Covid-19 that has affected many activities at all levels, imposing a global confinement, it has been noted that, although the students of the School of Communication Science of a private university located in Los

Olivos district, Lima province, Peru are considered "digital natives", their digital skills would not be developed; and this indicates a poor management in communication, in their skills for solving problems and handle information using computer technology, making it difficult to develop their learning activities. The purpose of this research is to determine the relationship existing between digital competences, specifically in terms of IL and RT, among those students.

Information literacy (IL)

The term information literacy was coined by Paul Zurkowski in 1974 (Abas et al., 2019). It represents the attributes of an individual who is able to locate, recognize, evaluate and effectively use the required information (Moreno-Guerrero et al., 2020). This is indissolubly linked to the universal human rights, as it is related to information and content, the access, the capability to receive and evaluate it in a critical manner, being able to create, use and widely distribute it (Muratova et al., 2019).

IL is defined as the skillset required by the individuals to browse, scrutinize, filter, critically evaluate and be able to manage the information, as organized by DigComp 2.1 (Carretero et al., 2017; INTEF, 2017); Figure 1 shows how the three dimensions supplement each other to achieve this competence; Table 1 shows the segmentation with the eight staggered levels with criteria; and Figure 2 shows the level of complexity in the evolution of the achievement of competences.

Figure 1

Search, evaluation and management of information in Information Literacy (IL)
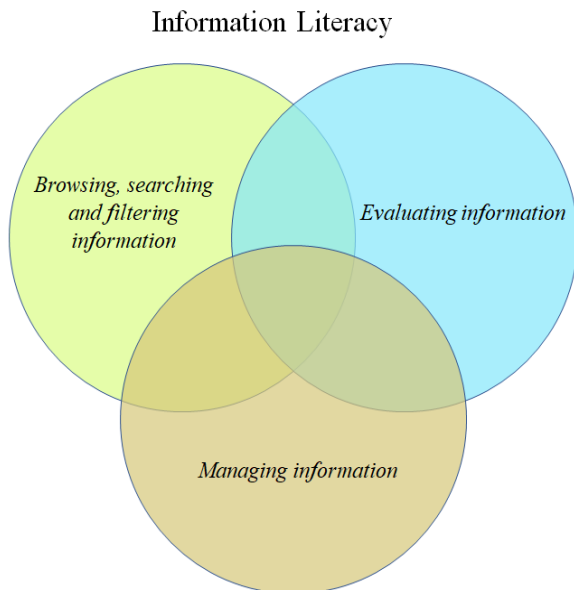
Note. Interaction of IL dimensions for the achievement of competences in people.

Table 1

Diagram of IL competence levels as per DigComp 2.1. classification

DigComp 1.0	Dig Comp 2.1	Complexity of the Activities	Autonomy	Cognitive Mastery
Basic	1	Simple activities	With guidance	Remembers
	2	Simple activities	Autonomy and with guidance when needed	Remembers
Intermediate	3	Well-defined and routine activities and simple problems	On my own	Understands
	4	Activities and well-defined and non-routine problems	Independent and based on my needs	Understands
Advanced	5	Different activities and various difficulty levels	Guiding others	Applies
	6	More complex activities	Adaptable to others in a complex environment	Evaluates
Specialized	7	Resolves complex difficulties with some limitations	Contributes to professional practice and guides others	Creates
	8	Solves multi-factor complex difficulties that interact	Innovates processes in the field	Creates

Note. Basic, intermediate, advanced and specialized level in the evolution of the achievement of IL competences.

Figure 2

Levels in the achievement of IL digital competences
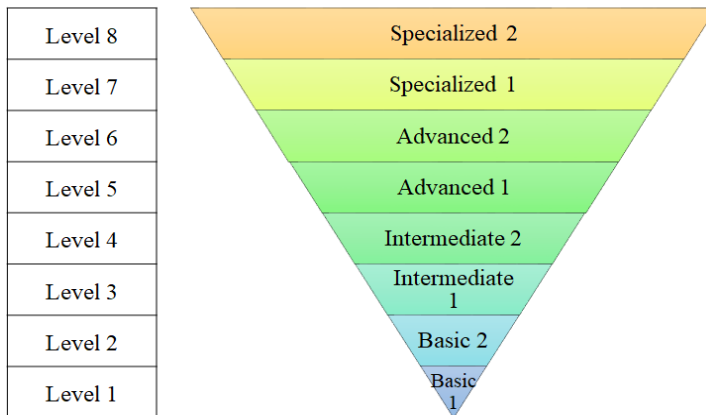
Note. Reverse triangulation of the evolution in the achievement of IL levels

IL is composed of three dimensions (Carretero et al., 2017) related to the achievement of skills linked to accessing, scrutinizing, reviewing and managing the information, focused on the following dimensions: 1) browse, research and filter information: ability to scrutinize, recognize and access the required information; 2) evaluate the information: analytic capability to compare, evaluate and interpret the information in a critical manner, safety and good sense of the media and; 3) manage information: be able to organize, file, obtain and process the information in simple or complex contexts.

These dimensions supplement each other to achieve competences in the processing of information that help to develop professional and academic activities. According to DigComp 2.1, they are organized in eight evolutionary levels, from N1 (Basic 1) through N8 (Specialized 2), going through intermediate levels of greater complexity until reaching a higher level. Evolving from the search, browsing, application of filters and management of information through a guide; then, the person performs these procedures autonomously, expresses and justifies the information he/she needs and shows how to connect to the content; by adapting strategies to search and access more pertinent contents; at the next level, he/she manages to train other people so they can search, filter and manage information; until reaching the capability to propose and develop innovations in the search, the application of filters and management of information (Carretero et al., 2017); Figure 3 shows the development of the levels of IL competences to browse, search and apply filters to the information.

Figure 3

Evolution of browsing, search and application of filters to information in IL

Browsing, searching and filtering information

Level	Description
Level 1 (Basic 1)	With help achieve results
Level 2 (Basic 2)	With some autonomy achieves results
Level 3 (Intermediate 1)	Explains their need for information; how to access and navigate; and accurate and routine search strategies.
Level 4 (Intermediate 2)	Exposes their need for information; how to access and navigate; describes and organizes custom searches and strategies.
Level 5 (Advanced 1)	Responds to information needs, searches for information, shows how to access and navigate; and proposes personal search strategies
Level 6 (Advanced 2)	Assess information needs; adapts search strategies, explains how to access and navigate in more appropriate ways; and uses several custom search strategies.
Level 7 (Specialized 1)	It proposes solutions to complex problems that are poorly defined to navigate, search and filter information. Use your knowledge to contribute to professional knowledge and guide other people
Level 8 (Specialized 2)	It proposes solutions for complex problems with diverse factors to navigate, search and filter information. Proposes innovations to the sector

Note. Evolution of the achievement at the basic, intermediate, advanced and specialized levels in the search and application of filters to information in IL

Reciprocal teaching (RT)

RT emerged as a reduction process of the gap in reading comprehension in 1984, where teachers provided the basis and the tools for the co-learning between peers (Boamah, 1997). In RT sessions, the leadership roles are exchanged between teachers and students, while the students learn to lead debates and raise their own questions, teachers provide them with support (Martínez et al., 2011). The purpose of this interaction is to guide the students to personalize and internalize together, using problem-solving strategies that facilitate the autonomous learning based on the interaction between peers, to share knowledge.

The method applied the principles of active learning, the students received help to have appropriate learning strategies that promote collaborative learning, feedback and recognize teamwork, agreeing rules and starting the reflective process (Rebollo et al., 2012). The teacher-student collaborative system allows achieving better results than doing it on an individual basis; and, to a certain extent, this learning method is related to the mental development and the cognitive reflexes of the students (Escallón et al., 2019). These aspects enrich the RT and characterize it as a participatory teaching style.

RT highlights the collaboration and dialogue in the classroom, when a teaching-learning model is adopted and where cooperation is a problem; this allows the students to support each other and collaborate throughout the process to solve assignments, in the analysis of documents in small groups or to mutually discuss the learning and take responsibility regardless of the success of the activities.

Consequently, the students can learn from their classmates through group activities to improve various cognitive skills, because one of the key components of interpersonal intelligence is the capability of interacting in one's social environment (Abas et al., 2019).

This study links the aspects of RT that influence the improvement of skills and the fostering of attitudes among the students. Ability is understood as the practice or technique to know how to do something in a personal, specific manner or as an examiner in difficult situations (Torres, 2017). Attitude is the inclination or predisposition to judge something or a context in a certain manner that transforms the beliefs about it, motivating the person to act in favor or against as a result of his/her evaluation (Andrade-Valles et al., 2018).

Purpose of the research

The general objective of the research is to determine if there is a relationship between the variables of the IL study and RT among the students of the professional school of communication science. But, with regard to the established dimensions, essentially in the IL, a tiered categorization scheme was adopted, the objective of determining the level of predominance in its three dimensions (search, evaluation and management) was proposed in RT activities. In the current situation, the students must apply collaborative methodologies between classmates, making use of the technology resources that evolved for that purpose, but the use of these technologies would require a level of development in digital competences, including those of IL, which we intend to establish in this study.

Methods

Participants

This was a cross-cutting descriptive research of a basic quantitative nature with a non-experimental design. The analyzed sample was composed of 249 students of the undergraduate program between the 6th and 7th term of the professional school of communication science. Data were collected in a random, indirect manner, using a survey as instrument through a digital questionnaire designed at Google Form. The instrument was emailed to the students with a brief description of the purpose of the study and the operational definition of the variables, including the link of the form so that they accessed voluntarily; the identity of the participants was anonymized for the gathering of the data, trying to protect their personal data; pursuant to article 14 of the local legislation, no express consent is required for processing personal data when an anonymization or dissociation procedure is applied (Law No. 29733, 2011). In accordance with personal data protection, this was an anonymous survey and no data on age or gender were collected as this was outside the range of analysis of this research.

Instruments and procedures

The instrument was prepared in two sections, including the references of the variables. The list of skills described in INTEF 2017 was adapted for IL, regarding the professor's approach to the activities of the students and the principles of DigComp 2.1 (Carretero et al., 2017), defining 100 questions with a Likert scale (a range of 0 – 9, 9 being the highest score for the development of the skill), which cover the three dimensions and the eight levels of each dimension (32 questions for the search dimension, 34 for the evaluation dimension and 34 for the management dimension); the definitions of Abas et al. (2019) on the skills and attitudes developed by the students were taken into account for RT, establishing 22 questions for the two dimensions (10 for the skills dimension and 12 for the attitudes dimension). The measuring instrument met the reliability criteria by obtaining the same results in a sample of 30 cases, while the content was validated by three methodology experts. The reliability of the instrument was established using Cronbach's Alpha and obtaining values of .987 for IL and .992 for RT.

Data analysis

The Kolmogorov-Smirnov test used in the statistical analysis allowed determining the normality of the data, with results from .00 < to .05 for the significance value, determining that the data did not have a normal distribution and those non-parametric statistics had to be applied. Consequently, the correlation between the studied variables was evaluated using Spearman's Rho correlation coefficient, obtaining results of .372 and a significance value of .00, determining the existence of a significant relationship between the studied variables. To determine the predominance level in the dimensions, the Multinomial Logistic Regression test was applied in the IL variable, because it allows analyzing more than one variable with multiple ordinal categories against a dependent variable whose results are shown in the following section.

Results

Table 2 shows the descriptive analysis of the data, evidencing that the levels of the IL dimensions generally group at level N3 with 90% of cases and 10% between levels N4 and N5, evidencing the existence of significant aspects that would restrict achieving higher levels.

Table 2

Concentration of IL cases achieved by the university students

Competence level	%	% Accumulated
N3	90%	90%
N4	1%	91%
N5	9%	100%
Total	100%	

Note. IL competence levels reached by the university students

Table 3 shows the results of RT, evidencing that 43% of the skills improved using this method group at the Medium level and 34% lightly group at the High level; 40% of the promoted attitudes focus on the Middle level and 38% lightly group at the High level; however, 22% of the cases group at the Low level of both dimensions, which shows that a significant group of students are not able to evolve their competences properly.

Table 3

Concentration of cases related to the development of RT activities among the university students

Development of activities	Skills	Attitudes
Low	22%	22%
Medium	43%	40%
High	34%	38%
Total	100%	100%

Note. RT development levels reached by the university students

Table 4 shows the calculation of Spearman's Rho for IL and RT, where the value of the coefficient is .372 (significance of p = .000) and explains the existence of a low but significant positive correlation between the aforementioned aspects.

Table 4

Spearman's Rho correlation between IL and RT of the university students

		RT
IL	Spearman's Rho	.372
	Sig. (p)	.000
	N	249

Note. Significance values and correlation between IL and RT of the university students.

Table 5 shows the IL regression-Browse in RT; the IL dimension to browse, search and filter information that prevails in RT corresponds to level N3; the Sign. values of the crossing of level N3 are the lowest ones (Medium = .001 and High = .001); the values of B are higher (Higher = 1.686 and Medium = 1.504), evidencing that level N3 has the highest prevalence; the value of Exp(B) at the High level is 5.4 and at the Medium level is 4.5, these figures result in a higher probability that the students achieve a higher scale of IL competence level and a higher level of RT by 5.4 times; this evidences that level N3 prevails in IL and that the students have less possibilities of improving their development in RT if they do not achieve a higher development of IL for browsing.

Table 5

Predominance levels of the Browsing dimension in IL information in RT

IL: Browse / RT		B	Dev. Error	Sig.	Exp(B)	95% CI for Exp(B)	
						L. limit	U. limit
N3	Medium	1.504	.451	.001	4.500	1.858	10.899
	High	1.686	.487	.001	5.400	2.080	14.022

Note. Predominance values of the Browsing dimension in the IL information related to RT of the university students

Table 6 shows the IL regression-Critical evaluation of information in RT; the IL dimension to critically value the information that prevails in the RT corresponds to level N3; the Sig values of the crossing of level N3 of IL are the lowest ones (Medium = .000 and High o= .000) and the values of B are the highest ones (High = 2.128 and Medium = 2.079); determining that level N3 prevails and is below the expectations for communication students, while the hypothesis is that level N4 would predominate.

Table 6

Predominance levels of the dimension to Critically Evaluate the IL information in RT.

IL: Evaluate / RT		B	Dev. Error	Sig.	Exp(B)	95% CI for Exp(B)	
						L. limit	U. limit
N3	Low	2.037	.614	.001	7.667	2.302	25.534
	Medium	2.079	.433	.000	8.000	3.424	18.693
	High	2.128	.473	.000	8.400	3.323	21.231

Note. Predominance values of the dimension to Critically Evaluate the IL information related to RT of the university students.

Table 7 shows the IL regression-Manage the information in RT; the IL dimension to manage the information that prevails in RT corresponds to level N3; the Sig. values of the crossing of level N3 are the lowest ones (Low = .001, Medium = .000 and High = .000); the values of B are the highest ones (Low = 2.037, Medium = 2.120 and High = 2.104), evidencing that level N3 prevails; the value of Exp(B) at the Low level is 7.7, at the Medium level is 8.3 and at the High level is 8.2, evidencing that the students are more likely to achieve the Medium level at 8.3, the High level at 8.2 and the Low level at 7.7 times; evidencing that IL level N3 prevails and that there is a slight trend toward higher levels.

Table 7

Predominance level of the dimension of Managing the IL information in RT

Il: Manage / RT		B	Dev. Error	Sig.	Exp(B)	95% CI for Exp(B)	
						L. limit	U. limit
N3	Low	2.037	.614	.001	7.667	2.302	25.534
	Medium	2.120	.432	.000	8.333	3.573	19.435
	High	2.104	.474	.000	8.200	3.240	20.750

Note. Predominance values of the dimension of Managing the IL information related to RT of the university students

Discussion

The development of the IL variable achieves level N3 in 90% of the cases, the browse, evaluate and manage information dimensions achieve level N3 in each one of them, and this is consistent with the IL result of the teaching digital competence (Moreno-Guerrero et al., 2020), where the average global performance of these competences reaches a level of 3.2 and of 3.3, 2.9 and 3.4 in the dimensions, respectively, of a maximum value of 6.0. This shows the similarity of scenarios for the development of these competences between students of Peruvian and Spanish universities, and that

using similar instruments (DigComp) will allow obtaining similar patterns in the evaluation.

The evaluate information dimension is related to the capability of conducting a critical analysis of the content; hence, we think that people related to communication science must reach a higher level of development in this dimension, in the expectation that the main characteristics must be reliable, prevent and fight *fake news* and disinformation, and prevent their spreading in media and social networks (García-Marín, 2021); but it is evident that by only achieving level N3 it would not be possible to properly train a communicator based on the current curriculum and counting on the sole participation of the students, without a specific training.

When it has been determined that level N3 prevails on the scale established in Dig-Comp 2.1, this confirms the conclusion of IL in the teaching of natural sciences in flexible high school education models for adults (Cardona et al., 2021): the levels reached are not consistent with the generalized concept we have of the "digital natives", by expecting that they show greater mastery, with a high level in the achievement of digital competences, just for belonging to the age range, which is a mistake. It has been corroborated that this development must be achieved through cross-cutting teaching processes and methodologies for the professional training of the students and it cannot be expected that the development of digital competences and the use of technology by people born in the digital context will emerge spontaneously.

Sixty-five point five percent (65.5%) of the improved skills and attitudes promoted in RT focus on medium low levels, this proves that two-thirds of the students have not tapped al the potential of this method, the figures are far from the values obtained in the RT model and the interpersonal intelligence among social science students (Abas et al., 2019), where it is evidenced that strengthening skills such as collaboration, explanation, critical analysis, synthesis and content prediction makes it possible to improve the development of interpersonal intelligence; as well as by promoting a positive attitude toward cooperation, problem-solving, leadership, self-motivation, social relations and self-regulation. The gap in the results of our study poses the question of whether it is the university that has not promoted these teaching-learning methods or it is the educator who does not master it for an appropriate application.

Conclusions

It has been proven through statistical analysis that there is a more direct linking of digital competences, precisely of IL and the RT method, in the current context due to the need for using technology to develop skills and collaborative attitudes, and it has been evidenced that the higher the level of IL competences achieved in the three dimensions altogether, the higher level is achieved in the skills and attitudes of the students in the activities of the RT method. However, the expectation of the profile of communication science students in relation to the analysis of the information and the identification of its reliability is not met, and it is necessary to upgrade the level of those competences in order to achieve the expected level.

The university must rethink the existing curriculum, planning a new curricular development that includes the latest changes resulting from Covid-19, and the evaluation in digital environments, the growing digitization of the processes, the greater need for improving the digital competences of all those who interact in the university com-

munity and that their development must be transversal to all the aspects of academic training, highlighting the IL among these aspects.

It has been evidenced that the practice of the RT learning-teaching method is underdeveloped or is applied on reduced scales, wasting the potential of applying it in the academic sessions. The reduced number of research papers published by the university on this method reflects the scarce communication and application, since it is an innovative method in the local university context, but it is gaining relevance in academic activities at other universities, which shows the benefit and potential that can be leveraged.

The research also allows to approach the local reality and to review the current IL and RT ratios among the students of Lima, Peru, and as a starting point for future investigations of other studies to deepen the analysis of the curricular factor that would help to improve the levels of digital competences, some of them being the IL, the available technology resources, the required level in the competence of the educators and the responsibility of the universities with regard to the digital evolution.

References

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.

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 (Attitude, studying habits and academic performance: Approach from the theory of reasoned action). *Enfermería universitaria, 15*(4), 342-351. https://doi.org/10.22201/eneo.23958421e.2018.4.533.

Boamah, N. A. (1997). *Reciprocal teaching of comprehension-fostering and monitoring strategies in an ESL setting in Ghana.* Ohio University.

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. (Information literacy in the teaching of natural sciences in flexible high school education models for adults) *Ocupaciones pedagógicas en clave del desarrollo humana,* 197-213.

Carretero, S., Vuorikari, R., & Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens. With eight proficiency levels and examples of use. *Publications Office of the European Union*, 1–48.

Escallón, E., González, B. I., Peña, P. C., & Rozo, L. J. (2019). Implicaciones Educativas de las Teorías de Vygotsky: el Desarrollo de Conceptos Científicos en Estudiantes Bogotanos (Educational implications of Vygotsky's Theories: the Development of Scientific Concepts among the Students of Bogotá). *Revista Colombiana de Psicología, 28*(1), 81–98. http://dx.doi.org/10.15446/rcp.v28n1.68020.

Espinosa, A. (2020). Profesores "migrantes digitales" enseñando a estudiantes "nativos digitales" ("Digital migrant" educators teaching "digital native" students). *Medisur, 15* (4), 463–473.

García-Marín, D. (2021). Las fake news y los periodistas de la generación z. Soluciones post-millennial contra la desinformación (Fake news and generation Z journalists. Post-millennial solutions against disinformation). *Vivat Academia*, 37–63. https://doi.org/10.15178/va.2021.154.e1324

González-Rojas, Y., & Triana-Fierro, D. A. (2018). Actitudes de los docentes frente a la inclusión de estudiantes con necesidades educativas especiales (Attitudes of educators regarding the inclusion of students with special educational needs). *Educación y Educadores, 21*(2), 200-218. https://doi.org/10.5294/edu.2018.21.2.2.

Grande, M., Cañón, R., & Cantón, I. (2016). Tecnologías de la información y la comunicación: Evolución del concepto y características (Information and communication technologies: Evolution of the concept and characteristics)*. International Journal of Educational Research and Innovation, 6*, 218–230.

INTEF. (2017). *Marco común de Competencia Digital Docente (Common Digital Competence Framework for Teachers).*

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. 10.14658/pupj-ijse-2017-1-2.

Levano-Francia, L., Sánchez Díaz, S., Guillén-Aparicio, P., Tello-Cabello, S., Herrera-Paico, N., & Collantes-Inga, Z. (2019). Competencias digitales y educación (Digital competences and education)*. Propósitos y Representaciones, 7*(2), 569-588. http://dx.doi.org/10.20511/pyr2019.v7n2.329

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

Marzal, M., & Cruz, E. (2018). Gaming como Instrumento Educativo para una Educación en Competencias Digitales desde los Academic Skills Centres (Gaming as Educational Instrument for an Education in Digital Competences from the Academic Skills Centres). *Revista General de Información y Documentación, 28(*2), 489-506. http://dx.doi.org/10.5209/RGID.60805

Matamala, C. (2018). Desarrollo de alfabetización digital ¿Cuáles son las estrategias de los profesores para enseñar habilidades de información? (Development of digital literacy. Which are the strategies of educators to teach information skills?) *Perfiles Educativos, 40*(162), 68-85. https://doi.org/10.22201/iisue.24486167e.2018.162.58846

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.

Muratova, N., Grizzle, A., & Mirzakhmedova, D. (2019). *Media and Information Literacy in Journalism.* UNESCO.

Rebollo, Á., García, R., Buzón, O., & Barragán, R. (2012). Las comunidades virtuales como potencial pedagógico para el aprendizaje colaborativo a través de las TIC (Virtual communities as teaching potential for collaborative learning using ICTs). *Enseñanza & Teaching: Revista Interuniversitaria de Didáctica, 30,* 105–126.

Torres, C. M. (2017). Educación por habilidades: Perspectivas y retos para el sistema educativo (Education by skills: Prospects and challenges for the educational system). *Revista Educación, 41*(2)1–13. https://doi.org/http://dx.doi.org/10.15517/revedu.v41i2.21719.