Development Of Transversal Learning: Self-Perception In Undergraduate Business Students

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Abstract

The objective of the study was to recognize the self-perception of students linked to undergraduate programs of a faculty of business sciences regarding the development of transversal learning. It corresponds to research designed under the empirical-analytical paradigm, the quantitative approach and the non-experimental deductive method - transectional of descriptive level. Considering a population of 4,000 individuals enrolled in the School of Business Sciences, the sample was estimated at 369 participants -95% reliability and 5% margin of error-. An instrument of 32 items with five dimensions was used for data collection: critical reading and writing, assertive communication, quantitative reasoning, citizenship exercise and responsibility, and appropriation/use of information and communication technologies. The data were processed and analyzed through descriptive statistical procedures. The findings show that most of the study participants were located in the 'moderately developed' options for each of the formulated items, which shows that cross-cutting learning requires further strengthening from the pedagogical strategies of teachers for comprehensive training. Therefore, it is concluded that the transversal learning of students enrolled in programs in the area of business sciences for the context of study requires further development and strengthening, especially those associated with critical reading and writing both in the mother tongue and in a second language, assertive communication in a second language, and quantitative reasoning.

Keywords: perceptions; cross-cutting learning: university students; business sciences

Desarrollo de aprendizajes transversales: Autopercepción en estudiantes universitarios de ciencias empresariales

Resumen

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El estudio tuvo como objetivo reconocer la autopercepción de estudiantes vinculados a programas de pregrado de una facultad de ciencias empresariales respecto al desarrollo de los aprendizajes transversales. Corresponde a una investigación diseñada bajo el paradigma empírico-analítico, el enfoque cuantitativo y el método deductivo no experimental - transeccional de nivel descriptivo. Considerando una población de 4.000 individuos matriculados dentro de la Facultad de Ciencias Empresariales, la muestra fue estimada en 369 participantes -95% de confiabilidad y 5% de margen de error-. Para la recolección de los datos se empleó un instrumento conformado por 32 ítems asociados a cinco dimensiones: lectura crítica y escritura, comunicación asertiva, razonamiento cuantitativo, ejercicio y responsabilidad ciudadana, y apropiación / uso de tecnologías de la información y la comunicación. Los datos fueron tratados y analizados a través de procedimientos de estadística descriptiva. Los hallazgos muestran que la mayoría de los participantes del estudio se ubicaron en las opciones 'moderadamente desarrollado' para cada uno de los ítems formulados, lo cual evidencia que los aprendizajes transversales requieren de un mayor fortalecimiento desde las estrategias pedagógicas de los docentes para la formación integral. Se concluye que los aprendizajes transversales de los estudiantes adscritos a programas del área de ciencias empresariales para el contexto de estudio requieren de un mayor desarrollo y fortalecimiento, especialmente, lo asociado con la lectura crítica y la escritura tanto en lengua materna como en un segundo idioma, la comunicación asertiva en segundo idioma, y el razonamiento cuantitativo.

Palabras clave: percepciones; aprendizajes transversales: estudiantes universitarios; ciencias empresariales

INTRODUCTION

Transversal learning can be understood as allowing a complementary preparation of individuals for adequate and relevant performance in the personal, work and professional spheres and within the framework of the so-called global citizenship (Argyri, 2019). The idea that a person should develop and enhance different types of learning from the higher education scenario is supported by comprehensive training. This corresponds to an encompassing and transcendental notion of education, since its basis recognizes that every individual is a macrosystem that interconnects subsystems for full functionality and coordinated existence (Martínez, 2011; Rutagwelera, 2021; Guerra, 2019; Jaedi et al., 2022). In this way, it is recognized that a subject is a dynamic and complex unit. This autopoietic organism is constructed and deconstructed in the process of permanent organization that leads to the (re)configuration of its physical, biological, cognitive, emotional, social, moral, ethical, political and cultural personality.

Based on the above, two central points of discussion involving higher education emerge. First, the urgency of recognizing the contexts with their diversity of spaces where the professional, labor and public action of university students will take place, and which are characterized by uncertainty, constant change, recurrent transformations at different levels and the emergence of needs that materialize in new areas and requirements for future graduates (Sá and Serpa, 2018; Hernández and Muñoz, 2012; Raj et al., 2020; Argyri, 2019). On the other hand, the need for curricula, pedagogical practices and teaching methodologies used in higher education institutions to be able to respond to the challenges of comprehensive training, to the changing demands that arise in the labor-productive sectors, and to the ideal of the exercise of citizenship in a global context (Larraz et al., 2017; Lavrinovič̌a, 2021).

Within the category of transversal learning are the abilities and skills related to information processing (Tsankov, 2018; Mediano et al., 2022), critical reading (El Ajraoui et al., 2019; Bezanilla et al., 2019), the construction of diverse texts (Valdés, 2021; Vine-Jara, 2020; Navarro and Mora, 2019), the responsible exercise of citizenship in a local and global context (Suzuki, 2022; Lenkaitis and Loranc, 2022; Horey et al., 2018), quantitative reasoning (Post et al., 2022; Shavelson et al., 2018), and the use of Information and Communication Technologies (ICT) (Qazi et al., 2022; Roztocki, Soja and Weistroffer, 2019). These knowledge located particularly in doing is transversal to the extent that they are helpful and necessary for

any professional in a labor field that is dynamic and changing, therefore, renewing the requirements in terms of competencies.

Information processing requires a set of cognitive skills and abilities that include identification, comparison and differentiation, analysis and synthesis, coding and decoding, seriation and establishment of patterns, as well as different forms of reasoning such as hypothetical, inductive, deductive, syllogistic, among others (Feuerstein, Klein and Tannenbaum, 1991); Feuerstein, Rand and Rynders, 1988), and that serves as a basis for other transversal learning such as critical reading or text writing. Information processing in higher education students corresponds to a widely studied and documented dimension, and several investigations account for university students' serious weaknesses and limitations for this set of skills and abilities (Jaramillo et al., 2011; Klahr and Wallace, 2022; Sá and Serpa, 2018).

Critical reading and writing of texts encompass broad communicative competence and other skills such as expressive language (speaking) and comprehension language (listening) both in the mother tongue and in a second language. Critical reading is related to the subject's ability to identify meanings within texts, establish inferential relationships between text and context, unveil communicative meanings and purposes, and evaluate meanings and value-ideological positions. On the other hand, the writing of texts implies the use of diverse structures and stylistic-discursive resources with communicative purposes that allow the production of texts with different themes, complying with the criteria of coherence, cohesion, fluency, pertinence and communicative ethics. In addition, it requires the exposition of arguments and the establishment of relationships between meanings, perspectives and positions.

The responsible exercise of citizenship in a global and local context is related to the individual's capacity to identify his or her rights and duties within a democratic, constitutional and international human rights framework and with this recognition, to value cultural diversities and intercultural richness for the protection of individual and collective rights, which implies a critical and reflective approach to conflicts and social problems that have an impact on the contexts in a systemic manner. Therefore, responsible citizenship also involves mobilization, dialogue, and social and political action to respond to socio-cultural and historical issues in intercultural and diverse contexts.

Quantitative reasoning incorporates skills to establish hypotheses and plans for data collection of mathematical data. It also includes the ability to produce texts, tables, figures, graphs, diagrams and schemes that evidence the treatment of quantitative data that lead to the description of particular phenomena or realities, and on which he/she can advance analysis and interpretations. For the development and strengthening of this competence, the person can collect, purify, organize, classify, and express data with a lesser or greater degree of abstraction. It also requires that all these processes are related to the environment and contexts, showing understanding and problem-solving ability.

Finally, the use of ICTs corresponds to a competence reflected in the timely, relevant and ethical use of office tools, multimedia resources and applications for accessing and managing information and reliable data. The individual with these skills can also select and organize information and data using other tools or software. The subject can also use ICTs to interpret data as evidence of his or her capacity for critical reading and digital literacy, which incorporates the communication of information in a reliable manner in digital environments and from an ethical perspective.

What can be observed about transversal learning is that it is intertwined and connected at different levels; in other words, it is integrated at different times so that the know-how shows competence and effectiveness. Although they are called transversal learning, they are complex expressions of human thinking and know-how due to the characteristics already mentioned. Therefore, their development in integral education is a critical and necessary issue in higher education, regardless of the area or disciplinary field in which the student is located. Considering its relevance and importance, the present study aimed to recognize the self-

perception of students linked to undergraduate programs of a faculty of business sciences regarding the development of transversal learning.

METHODS AND MATERIALS

It corresponds to research designed under the empirical-analytical paradigm, the quantitative approach and the non-experimental deductive method - transectional of descriptive level. The population consisted of 4,000 individuals enrolled in the Faculty of Business Sciences of a public university in northeastern Colombia in the following programs: business administration, public accounting and international commerce. The sample was estimated at 369 (n) participants having as criteria 95% reliability and 5% margin of error. The following statistical formula was used to determine the sample:

$$n = \frac{Zc^2 \times P \times Q \times}{E^2 \times (N-1) + Zc^2 \times P \times Q} \tag{1}$$

Where: Zc = 95% or 1.96 is the level of certainty under the normal curve; P = 0.5 is the probability of success; Q = 0.5 is the probability of failure; E = 5%-0.05 is the level of error; and N = 4,000 is the population.

For data collection, a Likert scale questionnaire comprised 32 items with five dimensions: critical reading and writing, assertive communication, quantitative reasoning, citizenship exercise and responsibility, and appropriation/use of information and communication technologies. The response options for each item were: very developed, moderately developed and poorly developed. In addition, the participant was asked to respond according to his or her self-perception regarding the development and strengthening of such learning. Table 1 lists the set of dimensions and indicators that were analyzed through the instrument:

Table 1: Structure of the Likert scale questionnaire applied. Dimensions and aspects of the common learning variable

Dimension	Aspects
Sociodemographic characteristics	Age, gender, professional program, level or semester of study, socioeconomic status, sector of residence, work, completion of another academic program.
Critical reading and writing	1. General critical reading in Spanish (item 1) 2. Critical disciplinary reading in Spanish (item 2) 3. Critical reading in general in a second language (item 3) 4. Disciplinary critical reading in a second language (item 4) 5. Non-verbal critical reading (item 5,6) 6. Academic writing in Spanish and a second language (item 7, 8) 7. Professional writing in Spanish and a second language (item 9, 10) 8. Informal writing (item 11)
Assertive communication	9. Clear, precise, concise speech or oral communication in Spanish (item 12). 10. Clear, precise, concise speech or oral communication of a disciplinary nature in Spanish (item 13). 11. Clear, precise and concise oral communication or speech of a disciplinary nature in a second language (item 14). 12. Assertive and comprehensive listening in Spanish (item 15) 13. Assertive and comprehensive listening in Spanish (item 16). 14. Assertive and comprehensive listening in a second language (item 17)

Quantitative reasoning	15. Logical-mathematical reasoning (items 18, 19, 20, 21) 16. Statistical reasoning (items 22, 23, 24)
Citizenship exercise and responsibility	17. Respect for and defense of human rights (item 25) 18. Coexistence and peace (item 26) 19. Participation and democratic accountability (item 27) 20. Plurality, identity and valuing of differences (item 28)
Appropriation and use of ICT	21. Knowledge of Information and Communication Technologies relevant to today (item 29) 22. Appropriation and use of Information and Communication Technologies relevant today in the personal field (items 30, 31). 23. Appropriation and use of Information and Communication Technologies relevant today in the professional field (item 32).

The instrument was validated through expert judgment. Three people with doctoral degrees in education evaluated each item under the criteria of neutrality, clarity, relevance, coherence and sufficiency. A pilot test was also applied to check the instrument's operability and the clarity of the items for the participants. Finally, the data were processed and analyzed through descriptive statistical procedures.

RESULTS

Of the total sample (n=369), for gender, the results show that 48.5% of the participants recognize themselves as cisgender women and 25.2% as cisgender men. The rest identify themselves with other options: gender fluid (2.4%) and non-binary (2.2%). 6.8% of participants preferred not to respond. The age of the students ranged from 18 to 36 years, with a higher percentage in the 18 to 26 years range (81.9%). Regarding the socioeconomic level, most participants belonged to the lowest strata 1, 2 and 3 (17.6%, 52.3% and 16.8%, respectively).

According to the professional program enrolled, the participants were distributed as follows: 20.1% in business administration, 31.7% in international trade and 48.2% in public accounting. Furthermore, according to the semester completed, the results show that 48.8% of the participants are between the IV and VII level, 37.4% of those in the initial semesters (I, II or III), and 11.4% of the students in the last semesters (VIII, IX or X). On the other hand, regarding the employment outlook of the participants, it was found that 42.5% are employed and 57.5% are only engaged in their university studies. Likewise, the results show that 56.1% have completed at least one technical or technologist program.

Critical reading and writing dimension. Table 2 shows the results of the answers given by the participants associated with the dimension of critical reading and writing. Regarding critical reading, most participants state that they moderately advance critical reading of texts written in different formats and varied genres in Spanish (60.4%). Notably, at least 22.8% of the students consider this ability to be poorly developed. Similar results are observed for critical reading of texts in different formats on topics associated with the studied professional program (61.8% moderately developed and 20.6% not very developed).

The items related to critical reading skills in a second language show results that tend to broaden the option not very developed: 50.1% of the participants consider their ability to do critical reading of texts in a second language to be moderately developed and 27.6% not very developed. However, it is observed that a consistent approach to texts in a second language is associated with topics specific to the professional program being studied (51.5% very developed and 30.4% not very developed). Regarding non-verbal critical reading with creativity -for example, images, figures, maps, statistical graphs, memes, and others-and which are not associated with the professional program, 58.3% of the participants perceive that they have this ability at a very developed level. Regarding non-verbal critical reading associated with their academic program, 61% of the students consider that they have this ability very developed.

However, the participants were asked about their perception of their academic writing level in Spanish and a second language. 64.2% of the subjects consider that they have moderately developed their ability to write different types of academic texts with clarity and coherence. They achieve argumentation and dialogue between authors following citation and referencing rules. Some 17.9% perceive this ability as poorly developed. These skills focused on a second language show some variations: 53.1% perceive this ability as moderately developed, and 28.5% as poorly developed.

Regarding the ability to write coherently, clearly and accurately in the mother tongue, associated with their training in reports, analysis and projects, most participants consider this ability to be moderately developed (67.2%) or very developed (18.2%). On the other hand, this same ability in a second language is self-perceived among the participants as moderately developed (52.8%) and not very developed (28.5%). Finally, regarding the ability to use writing to communicate ideas, opinions and positions to different audiences with coherence, clarity and precision, 66.7% of the participants consider this ability to be moderately developed, while 23.3% perceive it as very developed.

Table 2: Critical reading and writing dimension results

Item	Options	No	%
1. I constantly carry out critical readings of texts written in different formats, varied genres and with different themes or topics in the Spanish language.	Highly developed	62	16.8%
	Moderately developed	223	60.4%
	Underdeveloped	84	22.8%
2. I constantly carry out critical readings on texts written in different formats in Spanish on themes or topics associated with the professional program I am taking.	Highly developed	65	17.6%
	Moderately developed	228	61.8%
	Underdeveloped	76	20.6%
3. I constantly carry out critical readings of texts written in different formats, genres and with different themes or topics in a second language, for example, English.	Highly developed	82	22.2%
	Moderately developed	185	50.1%
	Underdeveloped	102	27.6%
4. I constantly carry out critical readings on texts written in different formats in a second language -for example, English- on themes or topics associated with the professional program I am taking.	Highly developed	190	51.5%
	Moderately developed	67	18.2%
	Underdeveloped	112	30.4%
5. I constantly perform critical reading on non-verbal texts - for example, images, figures, maps, statistical graphs, memes and others - easily and creatively, and which are not associated with the professional program I am taking.	Highly developed	215	58.3%
	Moderately developed	107	29.0%
	Underdeveloped	47	12.7%
6. I constantly perform critical readings on non-verbal texts -e.g. images, figures, maps, statistical graphs, memes and others- easily and creatively, and which are associated with the professional program I am taking.	Highly developed	225	61.0%
	Moderately developed	90	24.4%
	Underdeveloped	54	14.6%
7. I write academic texts with clarity and coherence, achieving argumentation and dialogue with authors that I cite and reference appropriately.	Highly developed	66	17.9%
	Moderately developed	237	64.2%
	Underdeveloped	66	17.9%
8. I write different academic texts in a second language with clarity and coherence, achieving argumentation and dialogue with authors I cite and reference appropriately.	Highly developed	68	18.4%
	Moderately developed	196	53.1%
	Underdeveloped	105	28.5%

9. I write different types of texts associated with my professional training, such as reports, analyses, projects and others, with coherence, clarity and precision, managing to communicate the ideas I wish to express.	Highly developed	67	18.2%
	Moderately developed	248	67.2%
	Underdeveloped	54	14.6%
10. I write different types of texts associated with my professional training in a second language, such as reports, analyses, projects and others, with coherence, clarity and precision, communicating the ideas I wish to express.	Highly developed	69	18.7%
	Moderately developed	195	52.8%
	Underdeveloped	105	28.5%
11. Through writing I can communicate my ideas, opinions and positions to different audiences, managing to transmit what I want to express because I achieve coherence, clarity and precision in the text.	Highly developed	86	23.3%
	Moderately developed	246	66.7%
	Underdeveloped	37	10.0%

Assertive communication dimension. Table 3 shows the results related to this dimension. Regarding the ability to easily communicate ideas, positions and arguments in different scenarios and with different audiences coherently and fluently, controlling nerves and pressures, 59.6% perceive this ability as moderately developed and 30.9% as a very developed ability. This same item, but focused on a second language, shows variations among participants: 48.2% moderately developed and 32.5% poorly developed. Similar results are observed for the same ability in a second language focused on career-related topics (47.2% moderately developed and 35.2% poorly developed).

Regarding the ability to listen with attention, concentration and respect for the understanding of messages that others seek to communicate, most participants are located in the very developed or moderately developed options (58.3% and 39%, respectively). The same results are observed for this ability in the university scenario with peers, professors and guests. However, this same ability, located in a second language, shows variations in the results: 46.3% very developed and 45.5% moderately developed.

Table 3: Results of the assertive communication dimension

Item	Options	No	%
12. I easily communicate my ideas, positions and arguments in different scenarios and with audiences coherently and fluently, controlling nerves and pressures.	Highly developed	114	30.9%
	Moderately developed	220	59.6%
	Underdeveloped	35	9.5%
13. I communicate easily and in a second language, my ideas, positions and arguments, in different scenarios and with different audiences coherently and fluently, controlling nerves and pressures.	Highly developed	71	19.2%
	Moderately developed	178	48.2%
	Underdeveloped	120	32.5%
14. I communicate easily and in a second language, my ideas, positions and arguments related to career topics, in different scenarios and with diverse audiences coherently and fluently, controlling nerves and pressures.	Highly developed	65	17.6%
	Moderately developed	174	47.2%
	Underdeveloped	130	35.2%
15. I listen with attention, concentration and respect to other people, understanding the messages they convey.	Highly developed	215	58.3%
	Moderately developed	144	39.0%
	Underdeveloped	10	2.7%
16. I listen with attention, concentration and respect to	Highly developed	215	58.3%

other people, whether they are peers (classmates), teachers or guests in the framework of academic life, understanding the messages they transmit.	Moderately developed	147	39.8%
	Underdeveloped	7	1.9%
17. I listen with attention, concentration and respect to other people who communicate in a second language, whether they are peers, teachers or guests in the context of academic life, understanding the messages they convey.	Highly developed	171	46.3%
	Moderately developed	168	45.5%
	Underdeveloped	30	8.1%

Quantitative reasoning dimension. Table 4 groups the results of the quantitative reasoning variable where 2 indicators were evaluated: mathematical, logical reasoning and statistical reasoning. Regarding 'logical-mathematical reasoning,' the participants were asked about their ability to work with various numerical data related to situations or relationships to identify problems. In this regard, 56.9% of participants considered this ability moderately developed and 31.2% very developed. However, the ability to work with a variety of data to respond to problems of daily and professional life is self-perceived among the participants as moderately developed by 64.8% and very developed by 27.9%.

Regarding the ability to represent in an abstract and codified manner problems present in daily and professional life, through numbers and symbols, 59.6% consider this ability moderately developed and 27.4% very developed. Moreover, for the ability to understand and comprehend problems that are expressed through numbers, symbols and signs, associating them with realities or situations of daily and professional life, 63.1% of the participants perceive it as moderately developed and 26.6% as very developed.

Similar findings are observed for the 'statistical reasoning' component. Regarding the ability to collect, organize and systematize qualitative and quantitative information for the statistical analysis of diverse data using different types of graphs such as bars, pies, scatter, lines, histograms, box plots and others, 63.1% self-perceive this ability as moderately developed and 28.2% as very developed. Regarding the ability to analyze, interpret and discuss statistical data, similar self-perception findings are observed: 63.4% moderately developed and 26.3% very developed. The results also show the same results regarding the ability to master and use different data processing tools for the organization and systematization of information for the required statistical analysis (62.6% moderately developed and 26% very developed).

Table 4: Quantitative reasoning dimension results

Item	Options	No	%
18. I can easily work with a variety of numerical data related to situations or realities to identify problems.	Highly developed	115	31.2%
	Moderately developed	210	56.9%
	Underdeveloped	44	11.9%
19. I can easily work with a great variety of numerical data related to situations or realities in order to give answers to problems of daily and professional life.	Highly developed	103	27.9%
	Moderately developed	239	64.8%
	Underdeveloped	27	7.3%
20. I can easily represent in an abstract or codified way problems present in daily and professional life through numbers and symbols, and from there, give answers to them.	Highly developed	101	27.4%
	Moderately developed	220	59.6%
	Underdeveloped	48	13.0%
21. I can easily understand and comprehend problems expressed through numbers, symbols and signs, associating them with realities or situations of daily and professional life.	Highly developed	98	26.6%
	Moderately developed	233	63.1%
	Underdeveloped	38	10.3%
22. I can collect, organize and systematize qualitative	Highly developed	104	28.2%

and quantitative information for statistical analysis of diverse data using different graphs such as bars, pies, scatter, lines, histograms, box plots and others.	Moderately developed	233	63.1%
	Underdeveloped	32	8.7%
23. I can analyze, interpret and discuss statistical data presented in different modalities, for example, bars, pies, scatter, lines, histograms, box plots and others.	Highly developed	97	26.3%
	Moderately developed	234	63.4%
	Underdeveloped	38	10.3%
24. I master and use different data processing tools to organize and systematize information for the required statistical analysis.	Highly developed	96	26.0%
	Moderately developed	231	62.6%
	Underdeveloped	42	11.4%

The responsible exercise of citizenship dimension. Table 5 shows the answers to 4 questions related to this dimension, which include respect and defense of human rights, coexistence and peace, participation and democratic responsibility, and plurality, identity and valuing of differences. In the first item, students were asked about their capacity for recognizing human rights in different international instruments and the 1991 Political Constitution of Colombia, their respect for these norms and their effective defense of them. The students' answers are located in developed and moderately developed options (43.6% and 49.6%, respectively). The same findings are observed for establishing and maintaining a healthy coexistence with others and carrying out actions to strengthen peacebuilding from different scenarios (53.4% very developed and 45% moderately developed).

In the item related to participation in society and the exercise of mechanisms for citizen participation (for example, voting, plebiscite or consultation), the participants placed themselves mostly in the moderately developed (52.3%) and very developed (41.5%) options. Finally, the value and respect for individuals and communities cultural, political, social and sexual plurality were evaluated, showing that 60.7% of the participants self-perceived this capacity as very developed.

Table 5: Results of the dimension responsible exercise of citizenship in global and local contexts

Item	Options	No	%
25. I recognize the human rights contained in different international instruments and in the Political Constitution of 1991, I respect them and I make an effective defense of them, whether they are my rights or those of other person(s).	Highly developed	161	43.6%
	Moderately developed	183	49.6%
	Underdeveloped	25	6.8%
26. I try to have a healthy coexistence with others and I carry out actions to strengthen peace building from different scenarios.	Highly developed	197	53.4%
	Moderately developed	166	45.0%
	Underdeveloped	6	1.6%
27. I actively participate in society, and therefore, I always exercise the mechanisms of democratic participation such as voting, plebiscite or consultations.	Highly developed	153	41.5%
	Moderately developed	193	52.3%
	Underdeveloped	23	6.2%
28. I value and respect the cultural, political, social and sexual plurality, among others, of individuals and communities.	Highly developed	224	60.7%
	Moderately developed	140	37.9%
	Underdeveloped	5	1.4%

Dimension of appropriation and use of information and communication technologies. Table 6 shows the results of the questions related to ICT skills and abilities. Regarding the ability to know the nature of different information and communication technologies, 53.7% of the participants are in the very developed option and 45% in the moderately developed option. Regarding know-how focused on the retrieval and

organization of information circulating through different technologies, most participants perceive this ability as moderately developed (50.1%) and very developed (48%). The same results are observed in the production of information with the support of available technologies and information communication within an ethical framework (53.7% moderately developed and 41.5% very developed). Finally, the results show better self-perceptions for the last item related to using ICTs to support professional work (53.4% very developed and 45% moderately developed).

Table 6: Results of the dimension of appropriation and use of information and communication technologies

Item	Options	No	%
29. I am familiar with the nature of different information and communication technologies and social networks.	Highly developed	198	53.7%
	Moderately developed	166	45.0%
	Underdeveloped	5	1.4%
30. I manage to retrieve and organize information that circulates through different technologies, in addition to social networks.	Highly developed	177	48.0%
	Moderately developed	185	50.1%
	Underdeveloped	7	1.9%
31. I easily produce information with the support of the technologies available for this purpose, and communicate such information within an ethical framework.	Highly developed	153	41.5%
	Moderately developed	198	53.7%
	Underdeveloped	18	4.9%
32. I use available information and communication technologies to support the professional work in which I am trained.	Highly developed	197	53.4%
	Moderately developed	166	45.0%
	Underdeveloped	6	1.6%

DISCUSSION

Most of the study participants were located in the 'moderately developed' options for each of the formulated items, which shows that cross-cutting learning requires further strengthening from the pedagogical strategies of teachers for comprehensive training. The relevance of these competencies in higher education is well documented in research (Florez et al., 2016; Guillen et al., 2021), and today more than ever, the urgency for their development and strengthening, in general, is recognized (Rebele and Pierre, 2019). While students are currently more aware of the need to possess different common and transversal competencies -manifested in the percentage of participants who have advanced technical and technological studies-, because it is demanded by the productive environment (Gruzdev et al., 2018; Succi and Canovi, 2020; Alshare and Sewailem, 2018).

In terms of critical reading and writing, it is noteworthy that few students perceive these skills as highly developed. On the contrary, it is observed that students recognize the skills associated with this dimension as moderately developed or poorly developed (Fidalgo et al., 2014; Lewison, Leland and Harste, 2014). Moreover, the percentage of participants increases when it comes to critical reading and writing in a second language (Fareed, Ashraf and Bilal, 2016; Mahboob, 2014), even though they have an approach to texts associated with their professional training in other languages. On the other hand, it seems that the participants' perceptions tend to show better abilities when facing non-verbal reading, that is, about multimodal texts such as images, figures, maps, memes, among others, and that it may be due to their permanent exposure to this type of readings through social networks and the Internet.

Emphasis should be placed on the percentages of students who perceive moderate or scarce development in the construction of texts associated with professional training both in the mother tongue and in a second language. The data suggest the urgency of modifying educational practices and curricular designs to improve results in these skills since, given the professional nature of the students, it is essential to strengthening them

in order to respond to the requirements of the work environments (Fatima, 2012; Uba and Souidi, 2020; Femi-Unueshotse, 2017). Likewise, the findings suggest the same regarding the ability to communicate orally in a second language in general and in scenarios where the use of a second language is required.

It is a matter of concern that given the professional program they are enrolled in, associated with business sciences, weaknesses are evident in both logical-mathematical reasoning and statistical reasoning. Therefore, it would be expected that the findings in this component would show better indicators than critical reading and writing. However, very few students are observed who self-perceive their ability to work with a great variety of numerical data to identify problems or solve problems or to abstractly represent information and data associated with reality or phenomenon as highly developed. Undoubtedly, pedagogical strategies and practices have required that aim to improve and strengthen processes of a cognitive nature, which are the basis of this type of capacities and skills (Jaramillo et al., 2011; Klahr & Wallace, 2022; Sá & Serpa, 2018).

CONCLUSIONS

The findings allow concluding that the transversal learning of students enrolled in programs in the area of business sciences for the context of study requires further development and strengthening, especially those associated with critical reading and writing both in the mother tongue and in a second language, assertive communication in a second language, and quantitative reasoning. Likewise, the research suggests that this type of learning is transversal not only because of its broad scope and relevance in the fields of scientific and disciplinary knowledge but also because of their relationship and interdependence among each other.

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