Digital Tools And Autonomous Learning In Secondary Education In Times Of COVID-19

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Abstract

The objective of the research was to determine the relationship between digital tools and autonomous learning in secondary education students of public educational institutions in times of pandemic, Lima Provinces, 2022. The research is of a quantitative approach, basic type, non-experimental design, cross-sectional, correlational. The study sample was determined by non-probability sampling for convenience made up of 823 men and 562 women made up of 5th year high school students from 9 educational institutions in the Lima Provinces. The instruments chosen were the Questionnaire for the measurement of Digital Tools with a Cronbach's Alpha value equal to 0.817 and the Questionnaire for the measurement of Autonomous Learning with a Cronbach's Alpha value equivalent to 0.978 proposed by Suquilanda (2022). According to Spearman's correlation, the result was that there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387), likewise, p=0.000< 0.05, confirms that there is a statistically significant relationship between digital tools and autonomous learning in secondary school students.

Keywords: Autonomous learning, Pedagogical Connectivism, Digital tools.

Introduction

The world in last two years has experienced a series of changes in its various activities, including education due to the pandemic caused by

Covd-19. In this sense, millions of teachers and students had to convert their homes into new classrooms and isolate themselves from others due to social distancing as a health protection measure against the pandemic. For which some countries were prepared, and were able to quickly adapt to this new normality, they had bubble classrooms and their teachers with necessary tools to continue the educational learning process. Educational impact that has arisen as a consequence of the pandemic, generated major problems such as school absenteeism, dropout of students themselves and their poor performance due to multi-causal factors. According to Cruz & Hernández (2022), the learning processes that have taken place around Latin America and the Caribbean have occurred in an unequal context because not all students had the same means or tools to continue their training. academic. On the other hand, they pointed out educational programs that are not prepared to face adverse situations in the educational sector.

Another problem identified at international level is digital divide occurs throughout world, rescued by Velasco et al. (2021) identified Internet access for student sector was limited given six out of ten students had service, a situation that forces students to look for a more efficient way to reinforce their learning that was already there. limited. This makes it possible for digital tools to continue providing education with programs such as Aprendo en Casa, radio educational programs for remote areas, virtual sessions, among others, where students were forced to learn the management of these, as well as discovering new tools that allow them to develop their academic activities in the best way. Accompanying this, the independence of the students to strengthen their learning is known as Autonomous Learning, where the student uses his own means to delve into the knowledge acquired and turn it into meaningful learning. For this reason, knowing that the student population of secondary level in Peru is greater than two million, the analysis of how digital tools (competence 28 of the National Curriculum) are related to the development of autonomous learning (competence 29 of the National Curriculum) has been considered. National Curriculum) in secondary level students of the most emblematic Educational Institutions of the nine provinces of Lima.

Siemens' theory of connectives (2004) explains how technology has influenced lives of human beings in their way of living, communicating and learning. In this sense, we assume digital tools make up a set of instruments allow elaboration of didactic contents make teaching process attractive, innovative and novel. On the other hand, Cárcel (2016) points out autonomous learning is a process involves actions

carried out by an individual in a responsible and independent manner motivated by the aspiration to increase knowledge, this is due to the fact autonomous learning is an action which is carried out by self-motivation of individual influenced by their autonomy in learning process. Regarding digital tools, Muñoz-Sánchez (2022) points out they are tools facilitate learning processes in educational context that is ready for various modalities of current education where virtually is one of main alternatives since it has a set of didactic tools help complement learning. Arroyo (2020) alludes to integration of these digital resources as a consequence of social confinement due to COVID-19 pandemic, where it has become essential to be able to use these to provide education, as well as to continue developing these educational activities for years to come. On the part of Chacchi (2022), these tools are part of the intangible means are used for various purposes, among which is provision of educational services, which during last five years have become more relevant. These are made up of a set of databases, audiovisual material, bibliographic records, among others, that provide information to educational community and contribute to a better understanding of reality immediately, as well as provide facilities to develop academic tasks. simple and complex more efficiently. In relation to autonomous learning Padilla et al. (2020) focuses on the autonomy the student has to search for information, its processing, interpretation and generation of knowledge that contributes to their daily life and, in turn, are adaptable to the educational environment without the need for a tutor or supervisor. On the part of Pérez (2020), this is part of a lifestyle that is drawn according to the studies and the skills developed from reading, writing, interpreting and discussing the knowledge acquired outside the educational context. Leiva et al. (2020) proposes autonomous learning as the ability of students to consciously and intentionally channel the way in which they acquire new learning with the purpose of achieving a specific goal or objective. Likewise, the author highlights that the incorporation of digital tools will not be enough to generate autonomy in a student, since they need motivational elements that allow them to develop it.

At international context, specifically in Chile, Ministry of Education (2020) promotes teaching staff to generate academic independence in the student where they are able to self-manage their learning activities outside educational context, proposing digital tools such as a priority source for acquisition of new learning as well as being a source that is constantly evolving. Vera (2021) proposes this type of learning is linked to the active role that each student has to face the academic challenges are presented to them, being able to apply their previous knowledge, their experiences and their commitment to give

their own meaning to the knowledge they learn. purchase individually; In turn, she pointed out that this learning facilitates the development in all educational stages of a student, it is worth mentioning school, university, technical, among others. Closing the set of ideas, Artiles et al. (2021) integrates digital tools into autonomous learning since these allow interaction between people, as well as with artificial intelligence, in certain cases, which allow the student to generate interest, as well as having available tools are easily accessible and management, allowing to solve problems and forming new knowledge autonomously. As a general problem, how are digital tools and autonomous learning related in secondary education students of public educational institutions in times of pandemic, Lima Provinces-2022? The purpose and purpose of the research is justified on three levels, mainly rescuing the social contribution it has for both the scientific and academic community, since it allows us to identify how digital tools have the ability to strengthen student competencies such as autonomous learning. Likewise, there is a theoretical justification since theories, approaches and theoretical proposals of different specialists in the subject are taken into account. Finally, at a practical level, a methodology was used that is governed on the basis of scientific research procedures that allowed formulating alternative solutions to a latent problem today. The importance of proposed study is based on the knowledge of how the integration of digital tools has been developed in the processes of autonomous learning in secondary level students in different provinces of Lima seeking to develop a comparison to identify aspects to improve in benefit of student learning. From the above, general objective of the research was to determine the relationship between digital tools and autonomous learning in secondary education students from public educational institutions in times of pandemic, Lima Provinces, 2022.

Method

Universe and sample

Study population is made up of secondary level students from an educational institution in each province of Lima according to table presented in Table 1.

Table 1. Distribution of students according to Educational Institution.

Province	Educational Institution	No. of students
Barranca	Francisco Vidal Laos	1050
Cajatambo	Paulino Fuentes Castro	171
Canta	3520 Agropecuario Zapan	235

Cañete	José Buenaventura Sepúlveda	1465
Huaral	Nuestra Señora del Carmen	2261
Huarochirí	San Antonio de Jicamarca	1003
Huaura	20320 Domingo Mandamiento Sipán	474
Oyón	20066 Simón Bolívar	445
Yauyos	Santo Domingo	97
Total		7201

Source: Obtained from Educational Census 2021.

Study sample was determined by non-probabilistic convenience sampling. For precise case of the investigation, students of the 5th year of secondary school were taken as a sample (table 2).

Table 2. Distribution of sample of 5th year high school students for convenience.

Province	Educational Institution	No. of students		Total
		Men	Women	
Barranca	Francisco Vidal Laos	129	104	233
Cajatambo	Paulino Fuentes Castro	23	15	38
Canta	3520 Agropecuario Zapan	31	22	53
Cañete	José Buenaventura Sepúlveda	257	0	257
Huaral	Nuestra Señora del Carmen	187	222	409
Huarochirí	San Antonio de Jicamarca	99	108	207
Huaura	20320 Domingo Mandamiento Sipán	48	41	89
Oyón	20066 Simón Bolívar	34	44	78
Yauyos	Santo Domingo	15	6	21
Total		823	562	1385

Note: Selected Educational Institutions are taken into account as they are most emblematic of each Province of Lima.

Data collection instruments

Instruments chosen were Questionnaire for measurement of digital tools proposed by Suquilanda (2022) which had a Cronbach's Alpha value equal to 0.817, being a highly reliable instrument and the Questionnaire for measurement of Autonomous Learning proposed by Suquilanda (2022) had a Cronbach's Alpha value equivalent to 0.978, being a highly reliable instrument.

Results

Digital tools become relevant in education, at least in Peru, as a result of COVID-19 pandemic, educational platforms such as zoom and other virtual platforms became means of communication between teacher and student. Digital tools arrived to demonstrate that not only presence of student in the classroom or teacher was enough, but that it is possible to teach and accompany the student's learning with the

help of various virtual applications in such a way that they achieve autonomous learning. However, in Table 3, not all teachers, as indicated by 51.3% of secondary education students from public educational institutions in Lima Provinces, used digital tools in their entirety, but have done so moderately or regularly, having achieved a regular autonomous self-learning, this percentage indicates that the majority of teachers show some limitation in the use of digital tools to achieve autonomous learning, which is also reflected in students, only 7.5% of students indicated their teachers had a high level of management in terms of digital tools for achievement of autonomous learning of students.

Table 3. Digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces.

| Digital tools | Autonomous learning | | | | | | Total | |
| | Bad | | Moderate | | Good | | | |
	Est.	%	Est.	%	Est.	%	Est.	%
Bad	21	4,5%	22	4,7%	2	0,4%	45	9,7%
Moderate	14	3,0%	238	51,3%	41	8,8%	293	63,1%
Good	3	0,6%	88	19,0%	35	7,5%	126	27,2%
Total	38	8,2%	348	75,0%	78	16,8%	464	100,0%

Selection of an application means good teaching, but also always achieves adequate learning, is even more difficult if teacher is not trained to navigate this technological and virtual sea. In Table 4, as stated by 40.7% of secondary education students from public educational institutions in Lima Provinces, when indicating the teacher handles educational applications moderately or regularly, for which reason students indicated autonomous learning, but in a moderate way. or regular. On the other hand, only 9.1% of students affirm their teachers have a good technological management that helps in the autonomous learning of students.

Table 4. Technological dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces.

| Technological dimension | Autonomous learning | | | | | | Total | |
| | Bad | | Moderate | | Good | | | |
	Est.	%	Est.	%	Est.	%	Est.	%
Bad	19	4,1%	47	10,1%	9	1,9%	75	16,2%
Moderate	15	3,2%	189	40,7%	27	5,8%	231	49,8%
Good	4	0,9%	112	24,1%	42	9,1%	158	34,1%

	Est.	%	Est.	%	Est.	%	Est.	%
Total	38	8,2%	348	75,0%	78	16,8%	464	100,0%

In Table 5, according to 38.4% of secondary education students from public educational institutions in Lima Provinces, they indicate teachers and they themselves have a moderate management of informational dimension and autonomous learning, due to little use of computer systems exist in educational institutions and the limitations they have to navigate the Internet and consequently have access to different databases and information of interest regarding the planning of classes not only for teacher but also for student. However, 11.2% of students considered they had a good level of information and autonomous learning as a consequence of teaching of some of their teachers.

Table 5. Informational dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces.

Informational dimension	Autonomous learning							
	Bad		Moderate		Good		Total	
	Est.	%	Est.	%	Est.	%	Est.	%
Bad	17	3,7%	29	6,3%	8	1,7%	54	11,6%
Moderate	16	3,4%	178	38,4%	18	3,9%	212	45,7%
Good	5	1,1%	141	30,4%	52	11,2%	198	42,7%
Total	38	8,2%	348	75,0%	78	16,8%	464	100,0%

Until this year, virtual education continues to be provided in public institutions, some more than others, due to presence of COVID-19, so interaction between students and teacher is carried out through interactive tools such as group and individual chats and even forums, achieving In this way, autonomous learning. In table 6, as indicated by 43.1% of secondary education students from public educational institutions in Lima Provinces. However, only 5.8% of students consider there is good communication achieves good autonomous learning for students.

Table 6. Communicative dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces.

Communicative dimension	Autonomous learning							
	Bad		Moderate		Good		Total	
	Est.	%	Est.	%	Est.	%	Est.	%
Bad	23	5,0%	67	14,4%	8	1,7%	98	21,1%
Moderate	12	2,6%	200	43,1%	43	9,3%	255	55,0%

Good	3	0,6%	81	17,5%	27	5,8%	111	23,9%
Total	38	8,2%	348	75,0%	78	16,8%	464	100,0%

In table 7, according to Spearman's correlation, it is determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387), likewise, p=0.000< 0.05, confirms there is a statistically significant relationship between digital tools and autonomous learning in secondary school students.

Table 7. Spearman's correlation of digital tools with autonomous learning in secondary school students.

			Digital Tools	Autonomous learning
Spearman's Rho	Digital Tools	Correlation coefficient	1,000	,387[**]
		Sig. (bilateral)	.	,000
		N	464	464
	Autonomous learning	Correlation coefficient	,387[**]	1,000
		Sig. (bilateral)	,000	.
		N	464	464

** Correlation is significant at the 0.01 level (bilateral).

In Table 8, according to Spearman's correlation, it is determined there is a low level of relationship between technological dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.295), Likewise, p=0.000< 0.05, confirms there is a statistically significant relationship between technological dimension and autonomous learning in secondary school students.

Table 8. Spearman's correlation regarding technological dimension with autonomous learning in secondary school students.

			Technological	Autonomous learning
Spearman's Rho	Technological	Correlation coefficient	1,000	,295[**]
		Sig. (bilateral)	.	,000
		N	464	464

Autonomous learning	Correlation coefficient	,295[**]	1,000
	Sig. (bilateral)	,000	.
	N	464	464

** Correlation is significant at the 0.01 level (bilateral).

In table 9, according to Spearman's correlation, it is determined there is a moderate level of relationship between informational dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.341), likewise, p=0.000<0.05, confirms there is a statistically significant relationship between informational dimension and autonomous learning in secondary school students.

Table 9. Spearman's correlation regarding informational dimension with autonomous learning in secondary school students.

			Informational	Autonomous learning
Spearman's Rho	Informational	Correlation coefficient	1,000	,341[**]
		Sig. (bilateral)	.	,000
		N	464	464
	Autonomous learning	Correlation coefficient	,341[**]	1,000
		Sig. (bilateral)	,000	.
		N	464	464

** Correlation is significant at the 0.01 level (bilateral).

In table 10, according to Spearman's correlation, it is determined there is a moderate level of relationship between communicative dimension and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.345), likewise, p=0.000<0.05, confirms there is a statistically significant relationship between communicative dimension and autonomous learning in secondary school students.

Table 10. Spearman's correlation on communicative dimension with autonomous learning in secondary school students.

	Communicative	Autonomous learning

Spearman's Rho	Communicative	Correlation coefficient	1,000	,345[**]
		Sig. (bilateral)	.	,000
		N	464	464
	Autonomous learning	Correlation coefficient	,345[**]	1,000
		Sig. (bilateral)	,000	.
		N	464	464

** Correlation is significant at the 0.01 level (bilateral).

Discussion

Campos-Perez et al. (2022) highlighted importance of autonomous learning in relation to digital tools that reinforce learning; In this context, our research determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387), reinforcing what was stated by previous authors. Salvador-Rosado et al. (2022) studied autonomous learning as a process favors strengthening of student competencies through application of a psycho-pedagogical program that yielded favorable results for students who showed a positive evolution during development of the research; convergent, our research determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387).

Padilla et al. (2020) managed to conclude YouTube as a digital tool, through its tutorials, works efficiently in educational processes take place outside school context; Strengthening our research, it determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387). Marcos and Moreno (2020), found audiovisual resources enhance conceptual autonomous learning in relation to use of films, achieving objectives in class but fail to generate attitudinal autonomous learning, which leads to non-reflection or information search outside of class. ; Divergently, our research determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387).

Song (2020) investigated the results of application of mobile education through an intelligent platform in autonomous learning of students, which can offer variety in teaching methods and improve student learning based on motivation and participation. thereof; In this sense, our research determined there is a moderate level of relationship between digital tools and autonomous learning in secondary school students from public educational institutions in times of pandemic, Lima Provinces, 2022 (Rho= 0.387).

Conclusions

It was possible to demonstrate the relationship between digital tools and autonomous learning in secondary education students from public educational institutions in times of pandemic, Lima Provinces, 2022, at a moderate level. Relationship of the technological, informational and communicative dimensions with autonomous learning in secondary education students of public educational institutions in times of pandemic was evidenced, at a low to moderate level. Finally, it is recommended the Regional Government of Lima Provinces implement regional education strategies allow teachers to improve the use of digital tools. Likewise, it is recommended the authorities strengthen the strategies of autonomous learning in students of the 5th year of secondary education in Lima Provinces in view of fact pandemic required them to develop individual activities and it would be very interesting to implement a program at regional level that develops these activities. skills, since on the one hand they would strengthen their learning according to their environment, and on the other,

they would prepare them for self-learning, self-motivation and the development of their own strategies since many of them would face the challenge of training at a higher level.

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