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RISKS OF DIGITAL COMMUNICATION IN THE TRANSITION TO NON-PRESENTIAL TEACHING

Riesgos de la comunicación digital en la transición a la docencia no presencial

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Abstract

The impact of confinement by Covid-19 has transformed the education model by accelerating new communication channels based on digitization. Suddenly the students had to continue their learning process from home, the teaching activity based on the presence of the teacher and the students in the same space has been transformed to become a digital space. The new model has not been without complications. This research has allowed us to analyze how the teaching-learning process has developed through digital communication to discover the new risks that must be prevented in online education. By applying an online questionnaire, the teachers have expressed their experience as a virtual teacher and have defined risks that must be faced and overcome: the digital divide, the lack of digital skills, the teacher as transmitter, demotivation and the abandonment of students. The hypothesis that establishes a relationship between the degree of digital communication and the degree of performance of teaching in the non-face mode has been verified. The educational scenario is designed by the new digital communication channels, based on the need for digital literacy for students and teachers, and incorporating the monitoring of new digital applications into teaching.

Keywords: digital communication, didactic, digital divide, teaching, non-face-to-face teaching, digital skills, learning.

Resumen

El impacto del confinamiento por el Covid-19 ha transformado el modelo de educación acelerando nuevos canales de comunicación basados en la digitalización. De forma repentina el alumnado debía continuar su proceso de aprendizaje desde casa, la

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actividad docente basada en la presencia del profesor y el alumnado en el mismo espacio se ha transformado para convertirse en un espacio digital. El nuevo modelo no ha estado exento de complicaciones, esta investigación ha permitido analizar cómo se ha desarrollado el proceso de enseñanza aprendizaje a través de la comunicación digital para descubrir los nuevos riesgos que se deben prevenir en la educación *online*. Aplicando un cuestionario *online* el profesorado ha expresado su experiencia como docente virtual y ha definido riesgos que se deben afrontar y superar: la brecha digital, la carencia de competencias digitales, el docente como transmisor, la desmotivación y el abandono del alumnado. Se ha verificado la hipótesis que establece relación entre el grado de comunicación digital y el grado de desempeño de la docencia en la modalidad no presencial. El escenario educativo es diseñado por los nuevos canales de comunicación digital, basados en la necesidad de la alfabetización digital para el alumnado y para el profesorado, e incorporar en la didáctica la monitorización de las nuevas aplicaciones digitales.

Palabras clave: comunicación digital, didáctica, brecha digital, enseñanza, docencia no presencial, competencias digitales, aprendizaje.

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1. INTRODUCTION

1.1. Regulatory context of the educational transition from face-to-face to distance education

On March 11, 2020, the World Health Organization (WHO) upgraded the public health emergency caused by coronavirus disease in 2019 (COVID-19) to an international pandemic. The rapidity of the evolution of the events has required immediate measures to protect the health and safety of citizens, to contain the progression of the disease, to reinforce the public health system to meet the needs of affected citizens and to avoid risks to their rights.

To address the health crisis, and in the context of Organic Law 4/1981, of June 1, 1981, on states of alarm, on March 14, 2020, Royal Decree 463/2020 declared a state of alarm in Spain for the management of the health crisis caused by COVID-19.

The measures do not imply the suspension of any fundamental right, as provided for in article 55 of the Spanish Constitution. While the state of alarm is in force, people must limit their movement on public roads as indicated in article 7, and in article 9 of Royal

Decree 463/2020 of March 14, containment measures in the field of education and training are described:

- The on-site educational activity is suspended in all centers and stages, cycles, grades, courses and levels of education contemplated in article 3 of the Organic Law 2/2006, of May 3, 2006, on Education, including university education, as well as any other educational or training activities provided in other public or private centers.
- During the suspension period, educational activities will be maintained through distance and *online* modalities, whenever possible.

Within the state regulations of the Ministry of Education and Vocational Training, Order EFP/365/2020, of April 22, establishing the framework and action guidelines for the third quarter of the 2019-2020 academic year and the beginning of the 2020-2021 academic year, in view of the crisis situation caused by COVID-19. has adopted measures that progressively define and expand the actions in the period of confinement in Vocational Training (VET):

- Care and welfare of students and families in relation to hygiene prevention and health promotion, financial aid and emotional support.
- School calendar and school activities, including the suspension of face-to-face educational activity in all centers and stages and its substitution by distance and *online* modalities.
- Educational resources for teaching and learning. Digital programs to promote the technological transformation of education, resources for online learning, web portal to facilitate access to resources, tools and applications for teachers, families and students, information for distance learning.
- The evaluation tests acquire the character of diagnostic and formative, face-to-face tests should be replaced by tests with telematic resources.

Order EFP/361/2020, of April 21, by which exceptional measures are adopted regarding the flexibility of Vocational Training teachings of the Educational System and Special Regime teachings, aims to establish exceptional measures during the 2019-2020 school year regarding the planning and organization of vocational training teachings of the educational system, as well as artistic and sports teachings:

- The digital divide of the student body. In order not to increase inequality in access to learning, it is necessary to guarantee access to learning and equal possibilities from home: computer, headphones, microphones, software and high-speed Internet connection.
- Cooperative projects. Creation of motivating projects to be able to interact and cooperate with students telematically and this entails modifying the evaluation system.
- *Online* workshop practices. Reinvention of workshop and laboratory practices to adapt them to *online* mode.

- Internships in a work center. Measures related to training internships in the workplace or FP Dual, for being affected by Employment Regulation Proceedings or Temporary Employment Regulation Proceedings.
- Technological resources: Do teachers have the necessary technical resources? Human and technological resources to deal with digitization, individual student monitoring, digital training.

The University of Zaragoza (2020) has also transformed classroom teaching into non-classroom teaching in resolutions of March 13 and 15, 2020, suspending classroom classes in accordance with the Protocol for action in the event of a health alert by the COVID-19. The alteration of teaching mainly affects the schedules, teaching methodologies and evaluation tests.

1.2. Digitalization, new communication channels in education

The suspension of face-to-face educational activity has unexpectedly caused an alteration in the development of the 2019-2020 school year, forcing the educational community as a whole to make a great effort to be able to give continuity to the teaching activity through other teaching and learning modalities, without face-to-face classes.

From one day to the next, tele-training has gone from being considered an optional teaching modality to being considered the main option, a compulsory modality in every educational system, which has meant a change in the mentality of teachers and students and the adaptation of a compulsory face-to-face teaching and learning process to a new distance and *online* system. In the new educational scenario, the protagonism is acquired by the Information and Communication Technologies (ICT) and digital communication to design the new model based on the digitalization of education.

How was the use of ICT in classrooms before Covid-19? Was the education system prepared to make the leap to digital transformation in one week? In relation to the use of ICT, BlinkLearning (2020) presented the results of the research "V Study on the use of ICT in Education" conducted in Latin America and Spain in the months prior to the start of COVID-19, showing an x-ray of the level of digitization of the educational system. The objective of the study was based on finding out the most used devices, the main challenges and difficulties encountered in the use of ICT, the advantages in the teaching-learning process, attitude and motivation towards ICT and the level of digital training. The main conclusions drawn from this study highlight the advantages of introducing technological resources in education:

- The use of ICTs means access to a greater number of content and resources.
- Forty percent of the teachers surveyed believe that ICTs promote autonomous learning.
- Prior to the pandemic, teacher training in ICT was deficient,
- ICTs motivate students, especially the use of cell phones to communicate and access information.

- The biggest challenges to achieve educational digitalization are teacher training, the problem of connectivity and access to technological devices.
- Motivation remains the driving force for students and teachers to improve education.
- The main deficit among students is the difficulty in selecting reliable information sources and lack of digital literacy to use applications.

1.3. Definition of the problem and purpose of research

According to Gómez, Contreras and Gutiérrez (2020), the use of ICTs in education has led to a discussion on the advantages and disadvantages of their incorporation: among the greatest advantages, the use of ICTs facilitates the teaching-learning process through access to a greater amount of information, and also facilitates contact with many people; as a disadvantage, they point out the unequal accessibility of students to the use of ICTs.

The study by Torrecillas, Vázquez, Suárez, and Fernández (2020) indicates that the digital immersion of Spanish society is a reality, the use of *smartphone* screens is increasingly present in both childhood and adolescence, managing to replace television in its socializing influence, integrating into the way of entertaining, relating and learning. According to Fundación Telefónica (2016), 81.9% of Spanish households are connected to the Internet and 95% of people aged 10 to 15 years browse the Internet.

Covid-19 is questioning the way education is delivered, the way students learn. The United Nations Educational, Scientific and Cultural Organization (Unesco, 2013) describes that establishing connections between education and ICT is more than talking about computers, applications, tools and programs, it means the opportunity to reflect on how education is thought about and how students and teachers learn and teach.

The irruption of Covid-19 has accelerated the debate on the impacts of the use of ICT in the teaching-learning processes, for Sierra (2020) the scenario is one of uncertainty and affects all human dimensions, daily behaviors, models of reality based on the need for connectivity and the risk of the digital divide and the development of the potential of each person in the responsibility of their choices.

In view of the new scenario of uncertainty, Cabrera (2020) opines on the Covid-19 crisis as an engine for generating social change, strengthening the educational system by evaluating weaknesses and opportunities. This research makes an x-ray of how the process of communication between teachers and students has been during the quarantine, discovering the risks when the physical spaces of socialization and learning of the school are transferred to the home of each student, when school and home become the same place.

In the context of the state of the art presented, questions arise that show the relevance of this study. What risks appear in the teaching-learning process, from home,

for teachers and students? Have digital applications become the way for didactic communication? Is digital communication compatible with the development of the curriculum?

Didactic communication consists of the communication and transmission of information between teacher and student in the context of the curriculum. According to López (2020), the curriculum organizes the approach to learning by competencies in order to address the following issues:

- Imparting contents of the National Qualifications System. Theoretical contents will be replaced by practical ones, so that students will focus on works and essays, eliminating exams.
- Motivate, to face the difficulty of having to motivate an *online* class group, to generate links and responsibilities.
- Methodologies and activities to activate learning to learn, meaningful learning and learning by competencies.
- Is student learning reliable? One of the main doubts is to verify that the students have managed to assimilate the subject syllabus and to verify that the learning has been the same as in the face-to-face classes.
- Is a telematics exam as reliable as a face-to-face exam? It measures the student's knowledge and ensures that the student does not commit fraud.

2. OBJECTIVES

The objectives of the research are related to the functions of teaching as defined in the Organic Law for the Improvement of Educational Quality and relevant to the teaching of vocational training:

- The teaching process of the modules that make up the program.
- The evaluation of the students' learning process, as well as the evaluation of the teaching processes.
- Tutoring students, directing and guiding their learning and supporting their educational process.
- Educational, academic and professional guidance of students, in collaboration with specialized departments.
- Attention to the intellectual, emotional, social and moral development of students.
- The contribution to the school and classroom climate of respect, tolerance, participation, and freedom for the promotion of the values of democratic citizenship.
- The promotion, organization and participation in complementary activities, inside or outside the school premises.
- Participation in the evaluation plans determined by the Educational Administrations or the centers themselves.

The initial pedagogical and didactic training for teachers is compulsory by means of postgraduate courses and the incorporation in the centers is developed under the tutoring of experienced teachers. In the permanent training of teachers, the educational

administrations will promote the updating and use of information and communication technologies and the training of all teachers in foreign languages, as well as the promotion of research and innovation programs that accompany the teaching function.

The educational administrations will also give priority attention to the observation and improvement of the conditions in which teachers carry out their work and to the encouragement of a growing consideration and social recognition of the teaching function. The general objective of the research, in the context of the suspension of face-to-face educational activity, maintaining the educational activities through distance and online modalities: to analyze the process of adaptation of the face-to-face teaching modality to the non-face-to-face teaching modality of the teaching activity in the educational centers of Vocational Training during the confinement due to the state of health emergency produced by the COVID-19.

What efforts have faculty made to keep distance and *online* teaching active? What are the risks of distance and *online* teaching? How does it affect the design of methodologies and activities in student learning? Given these questions, the research will follow the following specific objectives:

- To know the roles of the teaching staff in non face-to-face teaching.
- To determine the impact of non-classroom teaching on the student body.
- Analyze the risks of the new educational scenario.

The research will make it possible to know the teachers' opinions about the risks of the new teaching modality in comparison with the face-to-face teaching model, the use of new information technologies and the digitalization of education, to find out their opinion about the reliability of student learning, the degree of digital literacy of students and teachers, the keys to the success of methodologies and activities, the communication channels between teacher and students and communication among students, the process to capture the students' attention and the regulation of their learning.

3. METHODOLOGY

3.1. Population and sample design of the selected sample

The study population includes Vocational Training teachers from 15 Secondary Schools in the provinces of Zaragoza, Huesca and Teruel in the Autonomous Community of Aragon. Among the 26 types of specific Vocational Training families, the participating teachers belong to the professional families of Administration and Management, Commerce and Marketing, Hospitality and Tourism, Sociocultural and

Community Services, and also include the teachers of the transversal module of Vocational Training and Labor Guidance.

In the sample design strategy, with the aim of minimizing the sampling error, allowing rigor and scientific validity, the essential requirement that defines the sample is the selection of teachers who must perform the task of tutoring students who are taking the subject Practicum II within the program of the Master's degree to exercise the teaching profession, Master in Compulsory Secondary Education, Baccalaureate, Vocational Training and Language, Artistic and Sports Education, taught at the Faculty of Education of the University of Zaragoza, during the 2019/2020 academic year. The Master is composed of 17 specialties, the unit of analysis or selected sample, where the data collection will be carried out, is formed by the tutors of the students enrolled in the specialty of Vocational Training of the families of Administration, Marketing, Tourism, Community Services and Training and Vocational Guidance (FOL).

The sample size is intentional, it is a non-probabilistic and opinionated sample design (Wood and Smith, 2018), it is composed of 27 teachers, in the distribution by gender, 85% is female and 15% is male, teachers who perform the task of tutoring the Practicum II in Vocational Training centers in the teaching of training cycles of the professional families of administration and management, Commerce and marketing, Hospitality and Tourism, Socio-cultural and community services. For Barroso and Cabero (2013), the sample unit formed by the teaching staff is able to analyze the role played by new technologies both in the teaching staff and in the students, to find out the digital applications used and to study the most suitable digital competences for curricular development.

The measures and obligations derived from the Royal Decree 463/2020, of March 14, and the successive extensions of the state of alarm that had to be approved, with the due authorization of the Congress of Deputies, preventing not only the face-to-face educational activity, but also the training periods in work centers or practices of various university and non-university teachings, practice activities necessary to conclude the studies and obtain the corresponding degrees. With these indications, the Vocational Training teachers tutored the students of Practicum II in a non-face-to-face way, in strict confinement, during the period from April 15 to May 22, 2020.

The essential part of the Practicum II course is to approach the teaching environment of a Vocational Training Center. Non-attendance at the practice center during the whole of the established period is a necessary condition for students to be evaluated in the Master's course. The learning outcomes at the end of the course (University of Zaragoza, 2020):

- Characteristics of the students and of the class, understood as a formative and social group, the didactic strategies used by the teacher and the main teaching-learning problems detected.

- Design, implement and evaluate didactic sequences that are based on teaching-learning theories, incorporating elements of didactic innovation and proposing improvements based on the analysis of experience.
- Identify the contents to be worked on in the virtual classroom during the internship period, relating them to the cycle programs and official curricular documents.
- Identify students' learning difficulties, analyzing their causes and establishing implications on the teaching process.

The Practicum II enables students, together with the rest of the subjects, to exercise the teaching function in the field of professional training with guarantees of being able to propose different proposals to evaluate, innovate and research on their own teaching processes with the objective of continuous improvement in the teaching performance and the educational task of the center.

Vocational Training, in the educational system, prepares students to exercise professional activity and facilitate their adaptation throughout their lives to the changing labor market, contribute to their personal development and the exercise of democratic citizenship and allow a pathway in lifelong learning through the vocational training system for employment and their progression in the educational system. Within the general principles of the Organic Law 8/2013, of December 9, for the improvement of educational quality (LOMCE), which amends the Organic Law 2/2006, of May 3, and Education (LOE):

Vocational training comprises the set of training actions that enable the qualified performance of the various professions, access to employment and active participation in social, cultural and economic life. It includes initial vocational training, actions for the insertion and reintegration of workers into the labor market, as well as those oriented to continuous training in companies, which allow the acquisition and permanent updating of professional competencies (p.37).

In relation to the subject of this research and Vocational Training, three areas are highlighted in the LOMCE, as axes for the transformation of the educational system: information and communication technologies, the promotion of multilingualism and the modernization of Spanish Vocational Training.

The structure of the professional families is composed of a set of qualifications formed according to Law 5/2002 of June 19, 2002, on Qualifications and Vocational Training, the qualifications are the set of professional competences with significance for employment that can be acquired through modular training and through work experience. The professional modules organize the training to acquire a professional qualification, organize the learning process and provide a set of knowledge, skills and aptitudes that complete an education and training for the performance of a profession. The evaluation of the students' learning in the Basic Vocational Training cycles and in the Intermediate and Higher Level training cycles will be carried out by professional

modules and, where appropriate, by subjects or blocks, in accordance with the conditions determined by the Government by regulation.

3.2 Hypotheses and variables

Did confinement mean the end of the academic year, of teaching and of the teaching-learning process? The suspension of face-to-face educational activity in all educational centers was to be replaced by the distance or *online* modality. Given the new teaching formula and the lack of a contingency plan due to the immediacy of the pandemic, what has been the response of students and teachers?

Were the educational centers, students and teachers prepared to successfully face the e-learning process before the arrival of Covid-19? Covid-19 has arrived when all educational centers are computerized, when most homes have a computer and Internet connection and when almost all people have a cell phone. Covid-19 has arrived in the context of the democratization of the use of ICT for the development of the information and communication society, and the digitalization of society for the improvement of competitiveness.

The research has been carried out during the teaching period of the Practicum II course adapted to the distance learning modality, in order to make an analysis of the reality of how the teaching-learning process has been developed, finding out which have been the communication channels between teachers and students in the distance learning modality and which are the most imminent risks to be faced. In order to find out these questions, a causal and relational hypothesis has been defined: The degree of digital communication influences the degree of teaching performance in the non face-to-face modality.

The concern in the research focuses on the possibilities of teacher leadership for the management of the virtual classroom, and if the new roles of teacher leadership are directly related to the mindset for digital communication (Lankshear and Knobel, 2009), so the more digital communication, the more efficient the teaching. The impact of digital or virtual teaching on the teaching and learning process will be partially analyzed, being a relevant issue for future research.

Digital communication (Pérez, 2017; Romero and Rivera, 2019) means a new form of connectivity, understanding and creation of information. It involves learning and skills for the use of ICT or digital technology, including the ability to locate, store, retrieve, present, research, analyze and evaluate information, as well as to elaborate content and exchange information to communicate and participate in participation networks. The deficit in digital communication becomes digital illiteracy, due to lack of access to ICT and internet connection, generating social exclusion and digital divide.

The independent variable, "The degree of digital communication" is the key to ensure the success of the dependent variable "Influences the degree of teaching performance in the non face-to-face modality". The indicators that compose both variables, the

independent variable or digital competence and the dependent variable or teaching outcomes, are established by the European Framework for Digital Competence of Educators (DigComEdu) describing the meaning of the roles of the digitally competent teacher (European Commission, 2006).

3.3. Methods and techniques for data collection

In order to find out what are the risks of digital communication in non face-to-face teaching, during confinement, the descriptive methodology has been selected, with the objective of investigating the facts by means of an objective observation.

The tutors of the non face-to-face Practicum II have made it possible to learn about the experience of establishing new communication channels between teachers and students in the educational centers. Information on how, when, where, why and for what purpose of the channels used was obtained by means of the observation and measurement technique of the questionnaire, designed with open-ended questions. According to Albert (2006), the questionnaire is a structured technique that makes it possible to collect a wealth of information through the formulation of questions regarding the variables to be measured. The design of the questionnaire, by means of written questions, has made it possible to obtain qualitative and quantitative data for the analysis of the degree of digital literacy and its impact on the non face-to-face teaching modality, a new social reality that implies a new mentality.

In the design of the questionnaire, deductive reasoning was followed. The individual response form of the questionnaire was implemented at the end of the Practicum II period, according to Berganza and Ruiz (2005) in order to ensure that all students are in the same psychological situation and understand the same thing when reading the questions. Table 1 shows the questions and their corresponding indicators to analyze the research hypothesis. The questionnaire has been organized, sequenced and structured so that the answers can be processed to obtain the information.

Table 1. *Questions and indicators of the questionnaire*

Indicators	Questions
– Self-regulation. – Demotivation and abandonment.	What digital applications have been used in digital communication and induced behaviors?
– Communication. – Transmitter.	Where does the success of a VET teacher lie in the new context of non face-to-face teaching?
– Distance learning. – Digital divide.	Where is education headed?

Source: *own elaboration*

The descriptive methodology and the techniques of observation and measurement by means of the questionnaire have made it possible to explain the experience lived by the

teachers and the students before the modality of non face-to-face classes, in an immediate and unforeseen way due to the coronavirus pandemic. The systematization by means of categorization and tabulation of the information obtained through the questionnaires has guaranteed the scientific quality of the research.

4. DISCUSSION

4.1. Digital Communication in Secondary Schools

From one day to the next, the entire student body of the educational system had to continue their teaching and learning process at home, the physical space of the classroom was moved to the home. Confinement has unexpectedly transformed the management of education and has gone from having low digitization rates to becoming the future model of education. Quarantine, from homes, has meant forced training to make use of digital applications.

Traditional classroom communication has become a digital communication where new ICT-related variables intervene. The transition to the educational model of the future lies in the transformation from a face-to-face classroom model to a virtual classroom model. In this new scenario, digital communication becomes the key issue, the roles of teachers are strengthened in being the managers of learning, facilitating methodologies and activities through new channels and observing that students are able to understand them.

Through the questionnaire, the teachers of Practicum II numbered the tools that allow them to establish digital communication with the students of the IES of Vocational Training. The most used communication channels are shown in Figure 1:

- E-mail. 56% use e-mail as their primary means of communication.
- *Moodle*. 22% have named *Moodle* platform for digital communication and learning management. *Moodle* is useful for creating online learning communities, it is used for distance education, compatible with *e-learning* and *blended learning*. It promotes the constructivism of students' knowledge.
- *Classroom-Meet*. 12% have indicated *Google Classroom-Meet* applications.

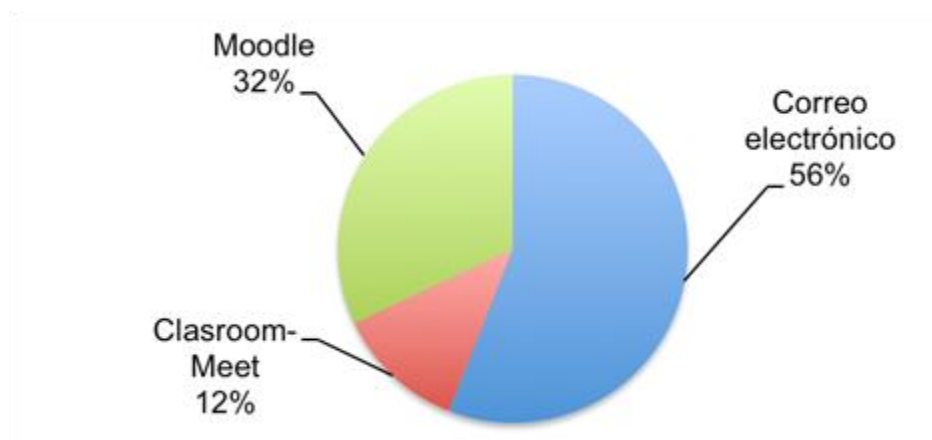


Figure 1: *Digital communication with students*
Source: *Own elaboration*

4.2. Risks of teacher leadership and student attitudes

In order for the teacher to be a tutor, facilitator, guide, dynamizer, organizer, moving away from the traditional role that placed him/her as the only transmitter of knowledge, he/she must start an active listening with the objective of detecting the necessary previous knowledge in the students to understand the ideas, the level of cognitive complexity they should have, the capacity of transference and development of critical thinking and the effective time they can allocate to the learning effort.

The data extracted from the questionnaire after being coded and tabulated yield information related to new teacher leadership and student attitude towards telestudy. Figure 2 shows the teachers' perception:

- Self-regulation. 60% of the teaching staff perceives that the students have not abandoned the link with the teaching-learning process and with the virtual classroom, have demonstrated competences for adaptation and change management based on autonomy and personal initiative, sense of responsibility, tenacity and spirit of self-improvement, time organization, task planning and decision making. Although it is impossible to generalize the behavior due to the variety of students in Basic Vocational Training, Middle Level, and Higher Level, the tendency towards autonomy and self-regulation of the pace of learning is highlighted.
- Demotivation and dropout. The threat of dropping out persists in Vocational Training; 40% of the teaching staff emphasizes that demotivation and the possibility of dropping out remain in the student body. This tendency is accentuated mainly among students in Basic and Intermediate Vocational Training and tends to disappear among students in Higher Vocational Training.

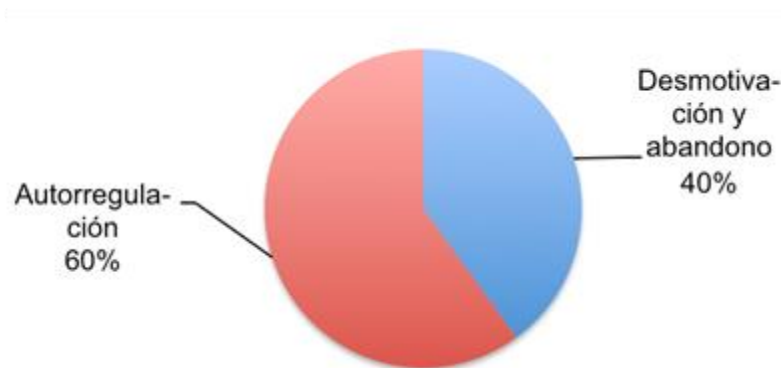


Figure 2: *Teacher leadership and student attitude*

Source: *Own elaboration*

4.3. Risks of the new teaching role

Until the confinement, the technologization of teaching consisted in a change of means and not of methods, due to the inertia of the curricular design and didactic programs of face-to-face education. Methodologies have been based mainly on the master class, the use of written language and rote learning. However, most students are digital natives, and the use of new technologies is part of their daily lives.

Tele-study from home for digital natives should introduce alternative resources and methodologies to textbook study and memorization and repetition. Figure 3 presents data on the new teaching role, highlighting two indicators, communication and transmission, which, although presented as opposites, can also be complementary:

- Communication. 84% of teachers were categorical in linking the digitalization of education with the establishment of new ways of communicating with students, communication to create virtual classrooms, to activate motivation, to manage the timing of methodologies and activities based on competencies, to create collective study environments in virtuality.
- Transmitter. The transmission of information as a way to generate knowledge and the learned teacher in his or her subject is still relevant for 16% of teachers. The question is how to adopt this model to the didactics required by *online* education, establishing the most successful procedures to guarantee knowledge: the methodology necessary for learning by competencies.

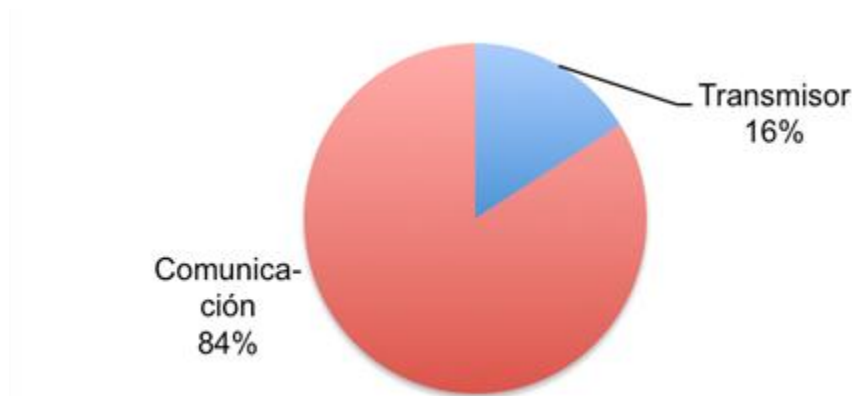


Figure 3: *New role of the teacher*

Source: *Own elaboration*

Teachers who are experts in their subjects, in the didactics of face-to-face classes, from one day to the next have found themselves in the need to rethink the curricular structure to adapt it to online didactics, assuming the risk of the uncertain impact on students and revealing the need to initiate training in digital competencies applied to education.

4.4. Risks of connectivity and the digital divide

A teaching-learning process, regardless of whether the modality is face-to-face or non-face-to-face, consists of an exchange of information using communication channels to allow *feedback* between people; the risk in this approach is the digital divide.

The digital divide is related to unequal access to ICT use by social groups. The widespread use of cell phones relates the meaning of the digital divide to unequal access to the Internet and digital illiteracy. The digital divide goes beyond access to ICTs, it is linked to the existence of network infrastructure, accessibility to digital applications and training in digital skills to make use of technology.

Connectivity problems and the digital divide it generates is one of the greatest risks detected by the teaching staff, and in Figure 4 the results show one of the greatest risks in non face-to-face teaching:

- Digital divide. The question of how to adapt compulsory face-to-face education to an online model is in the way with the digital divide, in the students and in the teachers. 88% of teachers have detected and identified the digital divide as the biggest problem for connectivity and achieving the link between teacher and student, a barrier that prevents them from managing the new roles of teacher leadership and necessary in digital communication to fight against dispersion, loneliness, demotivation and the feeling of excessive effort of students.

- Distance learning. Trusting students to manage their time in a self-directed way, committed to the tasks and progressing on their own, this is the perception of 12% of the teaching staff.

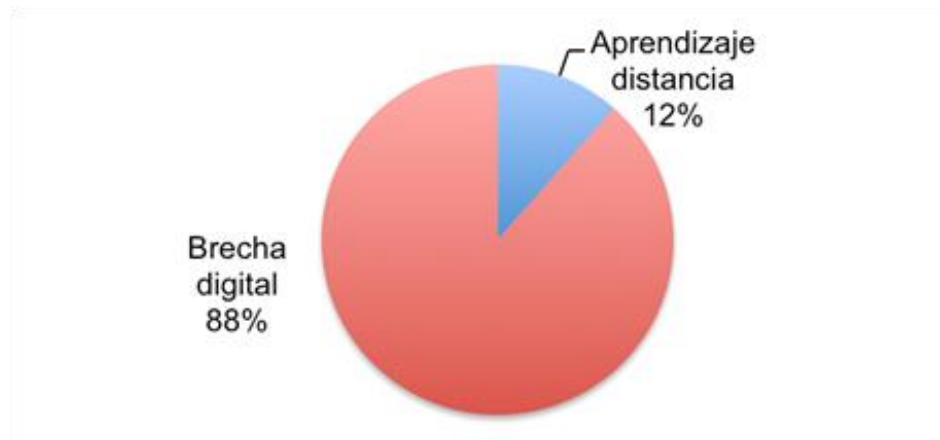


Figure 4: *Connectivity and digital divide*
Source: Own elaboration

The new communication technologies are definitely staying in education, the great revolution is the new awareness of learning to learn, to open new communication channels. The teaching staff perceives a near future where the IES will have the appropriate means to reduce the digital divide.

5. CONCLUSIONS

The general objective of the research, to analyze the process of adaptation of the face-to-face teaching modality to the non-face-to-face teaching modality, of the teaching activity in Vocational Training schools during the confinement due to the state of health emergency produced by the COVID-19, has allowed to approach the educational reality during the pandemic, where teachers and students have changed the classroom spaces of the IES to create new spaces from their homes, establishing a *feedback* through the ICT.

By means of an online questionnaire, teachers have expressed their perceptions about the development of teaching and student learning in the non face-to-face modality, information that has been analyzed, following the specific objectives of the research, to find out the risks of digital communication:

- Non-presential teaching involves the transition from the role of transmitter of content to that of creating virtual communication spaces. For 84% of teachers, the teacher as a transmitter of information has given way to the teacher who bases his work on digital communication to fight against demotivation, dispersion and the abandonment of learning by students, and to initiate a virtual classroom management based on the monitoring of new digital applications.

- Connectivity problems generate one of the greatest risks in the new scenario of the teaching-learning process, the digital divide. 88% of teachers relate the digital divide with the inexistence of network infrastructures, lack of devices with accessibility to digital applications and the formation of digital competences. The digital divide jeopardizes the efficiency of digital communication for teachers and students.
- 60% of the teachers trust in the self-regulation of student learning, demonstrating the management of change through adaptation to the new digital scenario, making an effort to maintain the link. However, this trend cannot be generalized to all VET degrees due to the heterogeneity of students in Basic, Intermediate and Advanced VET.
- The majority of teachers, 56%, have maintained the link with students through e-mail, initiating a distance teaching relationship. 32% have managed to use *Moodle*, a platform that allows them to initiate digital communication and learning management.

The analysis of the data obtained through the coding, tabulation and interpretation of the questionnaires, allows to verify the hypothesis "The degree of digital communication influences the degree of performance of teaching in the face-to-face modality", minimizing the risks that threaten the efficiency of online teaching: the digital divide, the teacher as a transmitter of content, the demotivation and abandonment of students and digital illiteracy.

To paraphrase the teachers surveyed, Covid-19 has ensured that ICTs remain in education; the great revolution consists in the new awareness of learning to learn in order to create innovative didactics that form teams, with communication structures that optimize the work of the teacher as a leader in the digital scenario.

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