

Percepción del desempeño docente-estudiante en la modalidad mixta desde una mirada ecosistémica

*Perception of teacher-student performance in the mixed mode from an
ecosystemic perspective*

*Percepção do desempenho professor-aluno no modo misto de uma perspectiva
ecossistêmica*

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Resumen

Los ambientes mediados por tecnología requieren prácticas docentes innovadoras que posibiliten el desarrollo de competencias en el estudiante. Con la finalidad de describir las interrelaciones del desempeño de docentes y estudiantes en un ambiente tecnopedagógico, el presente trabajo parte de los principios ecosistémicos de la modalidad *B-Learning*. Este estudio es de carácter cuantitativo descriptivo, mediante la prueba de asociación de ji al cuadrado aplicado a 149 estudiantes del Centro Universitario de los Altos de la Universidad de Guadalajara.

Las competencias analizadas tanto de los docentes como de los estudiantes fueron la planeación y la autogestión, la planeación y la resolución de problemas, las competencias didácticas, de análisis y de síntesis, la planeación y el manejo de información y, finalmente, la innovación y las habilidades de las tecnologías de la información y comunicación (TIC). Como resultado se encontró que la competencia en la que existe mayor correlación es la planificación y el desarrollo de la autogestión, la didáctica en relación con la habilidad de análisis y síntesis del alumno y, en menor, la relación entre la retroalimentación y la autogestión, así como la innovación y el uso de las TIC.

Palabras clave: B-Learning, competencia, desempeño docente, ecosistema, sistema educativo.

Abstract

Environments mediated by technology require innovative teaching practices that enable the development of competences in the student. The present study is based on the ecosystemic principles of the B-Learning modality, with the purpose of describing the interrelationships of the performances of teachers and students in a techno-pedagogical environment. This study is descriptive quantitative by means of the Ji square association test applied to 149 students of the University Center of Los Altos. The analyzed competences of teachers and students were: Planning / self-management, planning / problem solving, didactic competences / analysis and synthesis, planning / information management and innovation /TIC skills. As a result, it was found that the competition in which there is a greater correlation is the planning and development of self-management, the didactics in relation to the student's analysis and synthesis ability, and in lesser the relationship between feedback-self-management and innovation- use TIC.

Keywords: B-Learning, competence, teaching performance, ecosystem, educational system.

Resumo

Ambientes mediados pela tecnologia requerem práticas de ensino inovadoras que possibilitem o desenvolvimento de competências no aluno. Para descrever as inter-relações do desempenho dos professores e alunos em um ambiente tecnopedagógico, este trabalho baseia-se nos princípios ecossistêmicos da modalidade B-Learning. Este estudo é de caráter quantitativo descritivo, por meio do teste de associação do qui-quadrado aplicado a 149 alunos do Centro Universitário de Los Altos da Universidade de Guadalajara.

As habilidades analisadas de professores e alunos foram planejamento e autogestão, planejamento e resolução de problemas, habilidades didáticas, análise e síntese, planejamento e gerenciamento de informações e, finalmente, inovação e as competências das tecnologias da informação e da comunicação (TIC). Como resultado, verificou-se que a competição em que há uma maior correlação é o planejamento e desenvolvimento da autogestão, a didática em relação à capacidade do aluno de analisar e sintetizar e, em menor grau, a relação entre feedback e autogestão, bem como a inovação e o uso das TIC.

Palabras-chave: B-Learning, competência, desempenho docente, ecossistema, sistema educacional.

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Introduction

The new models of education of the 21st century promote the paradigm of student-centered learning. This through the generation of suitable learning environments in which the use of information and communication technologies (ICT) play an important role, as they are means that encourage interaction, communication, access to a wide variety of resources and information, the personalization of learning and universal access to education.

In that sense, the role of the teacher and the student in the environments mediated by technology are of great importance, so the objective of this research is to determine if there is a relationship between the competences of the teachers and the performance of the students who participate in the mixed modality of the University Center of Los Altos of the University of Guadalajara.

For the purposes of this research we will try to delimit the study of the teaching-learning subsystems and the competences that are related in these processes in this type of educational environments. All this from the performances that the actors demonstrate in a set of previously established competences. Thus, by describing how teachers interact with the educational system, the impact on student competencies can be demonstrated.

Therefore, this research is located in the current context, where the integration of ICT in the educational field has allowed the promotion of various educational modalities, for example, the mixed, also called Blended-Learning (B-Learning, for its English initials) or blended technology-optimized. These new models and changes of paradigms lead the docs and students to reconfigure their roles and actions within the educational field. The student becomes active and does not receive information. The teacher, for his part, assumes a role of guide, adviser, with the obligation to link what the student learns in class and its application in a given context; and in

addition to the above, in order to seek the appropriation and significance of the contents (Sánchez, 2015). This represents a reorganization in the dynamics of the teaching-learning process. In this vein, Garrison and Vaughan (2008) mention that mixed learning is the total fusion of "face to face" and online experiences.

Likewise, following Turpo (2013), the B-Learning modality is taking its own identity when it is situated in two main stages in its conception as a modality: the first refers to the emergence of the concept where the combinations or hybridizations of face-to-face resources are prioritized. The second refers to the integration of these components, rescuing the role of techno-pedagogical mediation. This modality is still acquiring a greater identity from the confluence of components with an intention, that is, the stage of the continuous convergence of approaches, resources, pedagogical and technological means. This new conception is favored by the consolidation of the knowledge society and the advancement of technologies through the resources that Web 2.0 now provides, which allows the collaboration, communication and interaction of the different actors of the educational event, prioritizing the student as the backbone of the learning process.

Therefore, the ecosystemic conception of the B-Learning modality is complemented by describing the interactions of the actors (educational community) in terms of the complex dynamics between the elements that converge in a modality such as the one described.

The term ecosystem of combined learning is introduced, on the other hand, to describe the components of combined learning and the evolution of the relationships between them. It should be mentioned that this term has its origin in biology, adapted to the education sciences. This ecosystem concept of the B-Learning model is introduced by Brodo (2006) and Uden and Damiani (2007), adopting the term to describe the effectiveness of the relationships between the actors involved and the use of technology. It is from here that the roles of each of the actors that contribute to the learning process are highlighted. Similarly, Nikolaidou et al. (2010) mention that the mixed learning ecosystem is formed in an academic environment that includes different interested groups (instructors, students, technicians and consultants) that use technology for learning, through means provided by the Internet and that allow the collaboration; thus, their interactions dynamically transform the ecosystem into a new learning paradigm.

One of the challenges of the mixed modality is in the instructional design of the courses, which demands creativity on the part of the teacher to achieve that convergence of online and face-to-face activities that are complemented by integrating techno-pedagogical strategies with the goal of achieving the objectives and competencies of each subject. In this design, in addition, a series of contextual needs must be contemplated, such as, for example, the discipline and level of development of generic competences of the working group, namely: self-management of learning, technological skills, communication capacity through Asynchronous and synchronous resources using the Internet, among others, as well as the effective integration of technology and access strategies by students. Therefore, it is necessary to have a strategic plan in which to inquire about the characteristics of the participants of the course to know their needs and previous requirements. In addition to a full awareness of generating metacognition processes in students to achieve an introspection about mental structures and their ways of learning.

The modality in question also requires in its design the organization to link the physical and virtual moments through technology. These means allow asynchronous and synchronous communication and interaction opportunities, which is why it is considered that a dual communication is handled in the virtual and face-to-face (Ramírez, 2012). That is why its design starts from the conception of integrating a wide range of learning experiences, that is, that are not restricted to the classroom and go beyond a list of activities. The teacher must be aware of what will be around them and must be able to transmit this same awareness to the students.

Similarly, when working with mixed environments, it is necessary to encourage work in small groups and have control over the work of the participants. This facilitates the involvement of students with communication tools and even allows for an effective tutoring process. It is necessary that a minimum of tension and a maximum of efficiency be developed. Under this approach, the idea is not to set very long or short work deadlines, but to plan learning situations that are achievable by the participant, taking into account their characteristics and, of course, a systematic follow-up by the facilitating teacher. For this follow-up a system of registration and monitoring of student progress is required, for example, the use of a learning management system (LMS), such as Moodle, which offers the possibility of keeping track of activities of each participant (Turpo, 2010).

Finally, the importance of the preparation of materials and diverse study tools (printed, electronic, visual, auditory, etc.) is highlighted, where the procedures to be followed are indicated so that the student feels comfortable during the learning process, that is, that a range of learning styles centered on the learner can be addressed.

As has been stated, the teaching-learning process in the B-Learning modality encourages and requires the development of a set of competences by the main actors (student and teacher). Therefore, this process is considered to be complex because a variety of interacting elements are involved. These educational systems promote a student-centered approach to the development of competences, so the different ways of favoring them are considered. According to Ruiz (2014) and Tobón (2013), when talking about the term competences in education it is necessary to refer to their conceptualization under a complex system, which implies a perspective of the educational reality in its multiple elements and its diverse interrelations .

The processes of development of competencies require performances and suitability in certain contexts, integrating different knowledge (knowing how to be, knowing how to do, knowing how to know and coexisting), to carry out a variety of activities and solve problems, articulating different human, social and labor dimensions that imply to some extent a degree of uncertainty (Tobon 2004).

In this way, the development of competences, from the ecosystemic point of view, is where collaboration networks are promoted between students and professors and where face-to-face and virtual converge, attending to conditions of diverse situations in which several interrelated subsystems intervene in a dynamic whose purpose is to meet the objectives of the education system. From the theoretical perspective of the ecological model proposed by Bronfenbrenner (1986), it is composed of four levels of systems: 1) microsystem, composed of the environment and the learning environment in which the student participates directly; 2) the meso system, which refers to the relationships between different environments; 3) the exosystem, integrated in larger contexts and environments that do not include apprentices directly, and 4) the macro system, which is shaped by the social, cultural and political factors in which students develop.

At these levels of systems a synergy of interactions between teachers and students is fostered, each of them developing a set of competencies that require subjects to mobilize the dimensions of the person, such as cognitive, social, affective and physical; all of which is reflected in his performance, either as a student or as a teacher. This is how the interrelationships that are generated in the B-Learning environments allow both teachers and students to develop or potentiate a set of competences by putting into play a wide variety of cognitive, procedural and attitudinal resources.

Finally, it is important to mention that the development of competencies implies that the individual mobilizes this set of resources, integrating them to face a certain situation. According to Perrenoud (1997) and Méndez (2007), the action of mobilizing requires complex mental operations and the correct combination and integration of both procedural and attitudinal and knowledge resources. Therefore, one of the most important tasks of the teacher is to promote this mobilization through activities, strategies and didactic resources.

Methodology

To address the nature of the problem of this research, a non-experimental study of a quantitative nature was proposed, assuming the descriptive-correlational design to determine the degree of relationship between the performances of both teachers and students. According to Hernández, Fernández and Baptista (2014), this type of study allows us to investigate the incidence of a set of variables in a given population at a given time. Thus, a description is provided by allowing to penetrate into the particular knowledge of the situations of the development of the competences of the actors of the teaching and learning process, as well as to explain their relationships, without forgetting their context, as are the environments mediated by technology.

Instruments and variables

The questionnaire technique was used in order to know the opinion of the students about the teaching performance and its relationship with the development of competences. It was built from the following variables:

- The relationship of the didactic planning with the self-management of the student (Planning / Self-management).
- Didactic planning and problem solving (Planning / Problem solving).
- Communication in the online course and face-to-face interaction (communication / oral and written communication).
- The pedagogical-didactic competence promoting analysis and synthesis (Didactics / Analysis and synthesis).
- Planning and management of information (Planning / Information Management).
- Teaching innovation and ICT skills in students (Innovation / ICT).

In the design of the questionnaire, the Likert scale was used, validating through Cronbach's alpha (.925) and determining an excellent level of internal consistency of the questionnaire.

For their analysis, the technique of frequency and dependence between qualitative variables was used, by using a statistical contrast of chi-squared (χ^2) in contingency tables of the different teaching competences, as well as the perception of the student's performance:

- The null hypothesis (H_0): there is a relationship between the teacher and the development of competences in the students.
- The alternative hypothesis (H_1): There is a relationship between the teacher and the development of skills in students.

The process to obtain the results is given when comparing the theoretical frequencies expected; in case of independence between the factors with the frequencies observed in the sample, we can conclude if there is a relationship of dependence or independence between the factors or attributes analyzed. That is, when:

- $\chi^2 < 0.05$: the result is significant, the null hypothesis of independence is rejected (dependence between the variables).
- $\chi^2 > 0.05$: the result is not significant, the null hypothesis of independence is accepted (independence between the variables) (Vicéns y Medina, 2005).

Population and sample

The population of this study was made up of 239 students from the Bachelor of Arts Degree in the semi-cohort of the University Center of Los Altos of the University of Guadalajara.

To determine the study sample, the probabilistic method was used, using the stratification technique, by dividing the population into eight different subgroups, from eight subjects studied. At the same time, a 95% level of confidence and a margin of error of 5% were considered, so the sample selected was 149 students distributed in four of the semesters, as shown in Table 1.

Tabla 1. Tamaño de muestra

<i>Semestre</i>	<i>Asignatura</i>	<i>Alumnos por materia</i>	<i>Tamaño de muestra</i>
2. ^o	Teoría de la argumentación y redacción jurídica	38	24
2. ^o	Teoría general del proceso	38	24
4. ^o	Derecho familiar	16	10
4. ^o	Derecho corporativo	16	10
6. ^o	Derecho civil IV	34	21
6. ^o	Derecho internacional privado	34	21
8. ^o	Ciencias forenses	27	17
8. ^o	Derecho contencioso administrativo	36	22
Total	8 asignaturas	239	149

Fuente: Elaboración propia

Results and Discussion

The data were processed with the statistical program Statistical Package for the Social Sciences (SPSS) version 22.0, through the frequency analysis and cross-squares of chi-squared. Of the 149 applied questionnaires that made up the research, the frequency of the results for each item is presented, as are the percentages in table 2.

Tabla 2. Frecuencia de respuesta para los ítems de relación de competencias.

Ítem	X	Sx	Resultados (%)			
			4	3	2	1
Planeación/Autogestión	3.53	.63	60.4	32,2	7.4	-
Actividades/Resolución de problemas	3.42	.64	50.3	41.6	8.1	-
Actividades/Autogestión	3.46	.64	54.4	37.6	8.1	-
Curso en línea/Aprendizaje	3.36	.72	49.7	36.2	14.1	-
Didáctica/Síntesis	3.64	.60	69.8	24.2	6	-
Didáctica/Análisis	3.61	.60	67.1	26.8	6	-
Curso virtual/Comunicación escrita	3.50	.70	61.7	26.2	12.1	-
Curso presencial/Comunicación oral	3.59	.66	68.5	22.1	9.4	-
Curso en línea/Manejo de información	3.52	.63	59.1	33.6	7.4	-
Actividades/Manejo de información	3.54	.61	60.4	33.6	6	-
Retroalimentación/Autogestión	3.58	.64	66.4	25.5	8.1	-
Innovación/TIC	3.52	.63	59.7	32.9	7.4	-
X: Media aritmética- Sx: Desviación estándar						
4: Siempre, 3: Casi siempre, 2: Algunas veces, 1: Nunca						

Fuente: Elaboración propia

Regarding the results of the mean and standard deviation in the weighting of the applied questionnaire, the relationship between the didactic teaching competence and the development of the student's ability to synthesize was obtained as a maximum value, with 3.64. While the competition with the lowest value was the planning in relation to the ability to solve problems, with an average of 3.42. These results can also be seen in table 2.

Next, the correlation study between the variables of teacher competence and student performance is presented, using the chi-square test. The relationship with the teaching competence was identified by item with a significance value of 0.05, with a confidence level of 95%.

From the variable Planning / Self-management (table 3), the result obtained shows that there is a statistically significant association between teacher planning and the perception of self-management development of the student $\chi^2(7) = 0.000$, $p < 0.05$, with a statistically moderate relationship (contingency coefficient = .436).

Tabla 3. Prueba de ji al cuadrado para la variable Planeación/Autogestión

	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	34.914	7	.000
Razón de verosimilitud	39.274	7	.000
Núm. de casos válidos	149		

Fuente: Elaboración propia

These results show that students perceive that teachers promote this competence from the management of the learning environment and in a smaller proportion is promoted through the teaching activities, since the results of the latter are below the total average .

The instructional design in the mixed courses acquired great relevance when generating activities in which the students rescue previous knowledge and activities that promote the construction of learning and integrators, where the student can mobilize their abilities to apply their knowledge. These results are related to the approaches of Gómez (2015) and Quiroga and Moreno (2012), who argue that the technology-mediated modality requires planning and, precisely, an adequate mediation by the teacher.

Therefore, in the design of activities it is fundamental to dedicate a space to the design of didactic strategies that motivate the interest of the student and that promote the appropriation of the contents and the ability to transfer said knowledge in problems that are presented to them. And in equal measure it is fundamental to favor learning strategies so that the student fulfills his goals; among these, metacognition strategies of the learning processes to gradually become self-

managing the construction of their knowledge. It is important to mention that the relation of the didactic planning on the part of the teacher and the development of the competence of self-management does not happen in an arbitrary way, since in this process of self-management development personal aspects are involved such as the intrinsic motivation of the student, which Sometimes, it is more difficult to promote by the teacher.

For the variable of Planning / Problem Solving (table 4) the results of the chi-square correlation of $\chi^2(7) = 0.014$, $p < 0.05$; therefore, an association between the teacher and the ability to solve problems is detected, with a contingency coefficient of 0.326; consequently, a moderate relationship is detected.

Tabla 4. Prueba de ji al cuadrado para la variable Planeación/Resolución de problemas

	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	17.675	7	.014
Razón de verosimilitud	18.920	7	.008
Núm. de casos válidos	149		

Fuente: Elaboración propia

These results show that there is little relationship between the strategies proposed by teachers in their planning and the development of problem solving skills. This is because in the table of frequencies and percentages (table 2), the average is below the average, which may be due to the type of activities proposed by teachers, as they are privileging the development of activities in the schools. that the student analyzes and synthesizes information that, in the end, can not be transferred to practical activities, which implies a paradigm shift in the instructional design of the teachers.

Training based on competencies is one of the fundamental tasks of the teaching-learning process of higher education, therefore, it is necessary for students to integrate their different knowledge in the resolution of problems of their profession. In this sense, the teacher must implement a set of strategies that allow students to mobilize their knowledge to face and propose problem solving procedures individually and collectively.

In this regard, Coll (2008) suggests learning based on problems, cases and projects. This type of methodologies aims to promote meaningful and functional learning, in addition to establishing bridges between real life and academic life through the study of cases and problems where the student is exposed to analysis and decision making. The role of the professor here is crucial, since the design, selection, sequence and organization of the contents, cases and problems appropriate for the development of competencies are required. In addition, the instructor should act as a guide that offers follow-up and assessment of what has been learned, allowing to relate it in different situations. Therefore, the teacher's task is indispensable in these strategies.

On the other hand, the variable Communication teacher / oral and written communication shows that there is a statistically significant association between the communication of the teacher in the face-to-face course and the development of the oral communication before the group, since $\chi^2(7) = 0.008$, $p < 0.05$; and with respect to written communication, an association of $\chi^2(7) = 0.026$, $p < 0.05$, with a contingency level of 0.336 and 0.311, respectively, so it is concluded that there is a moderate relationship between both variables (see table 5).

Tabla 5. Pruebas de ji al cuadrado para la variable de comunicación escrita y oral

Ji al cuadrado para la variable Comunicación oral			
	Valor	Sig. asintótica (2 caras)	
Ji al cuadrado de Pearson	19.010	.008	
Razón de verosimilitud	19.497	.007	
Núm. de casos válidos	149		
Ji al cuadrado para la variable Comunicación escrita			
	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	15.899	7	.026
Razón de verosimilitud	16.464	7	.021
Núm. de casos válidos	149		

Fuente: Elaboración propia

From these results we can say that communication is a fundamental educational act, which encourages interaction, participation and relations between teachers and students. In ICT-mediated education, communicative competence is a fundamental element that both teachers and students must develop to promote educational interactions.

And the development of communication in students must be promoted through different activities generated by the teacher, the communication itself promoting interactions and the use of communication strategies through different technological tools.

In the blended classes, communication is given orally and in writing; the first, mainly in the classroom, through the resolution of doubts, teacher expositions to students, among other teaching techniques. In the second case, written communication is offered through the use of electronic mail. Casamayor (2008) argues that electronic mail allows us to generate interactions with the student individually. Although the same message is sent to the whole group, its reception is individual. This means can motivate students, and attend private consultations. This is how the combination of different communicative actions allows orienting and collaborating in different spaces, with different means, to mention some examples, chat, social networks, forums, email and in-person communication interactions. Each of these tools allows the combination of group and individual work strategies.

Regarding the Didactic / Synthesis variable, a significant relationship was found χ^2 of 0.002 with 7 degrees of freedom in relation to the development of synthesis capacity. In a similar way, it happened between the teacher's didactics and the analytical ability, since the results show a χ^2 de $0.012 < 0.05$, concluding that there is a dependence between the teacher and the development of these skills in the student. These results can be seen in table 6.

Tabla 6. Prueba de ji al cuadrado para la variable Didáctica/Síntesis y análisis

Ji al cuadrado para la variable Didáctica/Síntesis			
	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	22.286	7	.002
Razón de verosimilitud	23.384	7	.001
Núm. de casos válidos	149		
Ji al cuadrado para la variable Didáctica/Análisis			
	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	17.944	7	.012
Razón de verosimilitud	18.310	7	.011
Núm. de casos válidos	149		

Fuente: Elaboración propia

It should be noted that these two mental processes of analysis and synthesis are very well valued by students, as can be seen in the frequency table (see table 6), with an average of 3.61, so their importance in the development of B-Learning modalities for the student's critical thinking, problem solving, organization and planning in decision-making. According to Morales (2013), the development of these skills can be encouraged by the teacher with activities such as reading, research, group discussion, cases and practical problems. These two thinking skills are fundamental for the development of learning strategies in the student and are present in the daily life of every human being, hence the importance of their development.

In the specific exercise of the students of the career of lawyer, which is the one that was evaluated, Alba (2010) mentions that "every lawyer must have sufficiently developed the ability to synthesize before any case know how to detect the key concepts and legal problems with those that face, knowing how to order them hierarchically as a previous step to their study and resolution" (p. 12).

Therefore, it can be concluded that the role of the teacher in the promotion of analysis and synthesis skills is of great importance from the proposed activities and the generation of a learning environment both virtual and in person.

Regarding the Planning / Information Management, the results of the chi-square correlation show that $\chi^2(7) = 0.004$, $p < 0.05$. For more, note the relationship that exists between teacher planning and the development of information management skills in the student (see table 7).

Tabla 7. Pruebas de ji al cuadrado para la variable Planeación/Manejo de información

	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	21.042 ^a	7	.004
Razón de verosimilitud	21.980	7	.003
Núm. de casos válidos	149		

Fuente: Elaboración propia

It was found that there is a relationship between teacher planning and the development of information management competence. This from the result of the frequency, where there is an average with values of 3.5 of the students surveyed.

These results agree with what Mauri and Onrubia (cited by Coll, 2008) states regarding access to information through ICT: because the student has access to the advantages of the information society, the role of the teacher is to obtain the maximum benefit of the richness of

that access and their information needs in a critical way. It is necessary to consider that the access and the application of the abilities for the handling of the information is not an exclusive competence of the students, it is a generic competence that both teachers and students are developing in the environments mediated by the TIC.

In the same area, Coll (2008) raises the following skills related to the handling of information when using ICT: search and consult new information and adapted to the learning needs of students, as well as manage, store and present the same information . It is important and justifiable the concern for the development of such competence in students, since some of them can be strengthened, perhaps, with new activities in which the selected information is questioned and thus generate a critical attitude towards it. Hence the importance that the teacher himself develops such competence to encourage the use of information in an appropriate manner.

Regarding Feedback / Self-management there is an independence between these two variables, which is corroborated by the data obtained in the calculation of the Chi-squared: χ^2 of $0.061 < 0.05$, therefore, the null hypothesis is accepted as there is no highly significant correlation (see table 8). One of the reasons for this phenomenon may be due to the fact that feedback in technology-mediated environments has not been promoted adequately and adequately.

Tabla 8. Pruebas de ji al cuadrado para la variable de Retroalimentación/Autogestión

	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	13.473	7	.061
Razón de verosimilitud	13.876	7	.053
Núm. de casos válidos	149		

Fuente: elaboración propia

The monitoring and feedback function by the teacher becomes a formative evaluation action that allows the student to recognize their learning to be strengthened.

Lozano and Tamez (2014) state that the constructive feedback that the teacher reports to the student must be specific, detailed, individualized, on time, focused on new learning, based on the areas of opportunity to improve learning. Therefore, these approaches can allow the development of metacognition in students that, in turn, allows the development of self-management.

According to Bandura (cited by Oviedo, 2012), self-management of learning is linked to factors such as metacognition, motivation and volition. Therefore, it was found that the planning and monitoring of the teacher is related to the self-management of learning in the factor of the student's metacognitive activities, based on the activities and tasks that are generated in the learning environment. Therefore, the process of self-reflection and motivation on the part of the apprentices is benefited through the management processes of the teacher's learning environment, where the continuous monitoring and evaluation of the activities plays a very important role.

The results in the frequency table also show that the average is 3.58, which demonstrates the promotion of self-management of the environment through feedback as part of the evaluation and resolution of doubts by the teacher. Therefore, feedback in environments mediated by ICTs becomes a guiding action for the student, supporting their metacognition processes. In this regard, Coll (2008) states that a teacher in environments mediated by ICT must have the competence to design assessment tasks for monitoring and control of student learning.

Finally, we present the results for the Innovation / ICT variable that were very similar to the previous ones, where in the chi-square test an independence of the variables was found when obtaining $\chi^2(7) = 0.142$, for $p < 0.05$. In this section, note that the value is greater than 0.05, in such a way that the independence of the variables is appreciated due to the lack of technological innovation on the part of the teacher (see table 9).

Tabla 9. Pruebas de ji al cuadrado para la variable Innovación/ TIC

	Valor	gl	Sig. asintótica (2 caras)
Ji al cuadrado de Pearson	10.918 ^a	7	.142
Razón de verosimilitud	11.090	7	.135
Núm. de casos válidos	149		

Fuente: Elaboración propia

The development of technological competences is largely related to the relationship that is generated in the learning environment, as well as to the degree of use and appropriation that the subjects face. Both teachers and students are in need of using different technological tools that allow them to communicate, learn and collaborate.

When establishing a correspondence between the technological competences of teachers and students, it was found that there is a bidirectional relationship, since both teachers and students are developing these competences when interacting in these environments. There are few teachers interviewed who demonstrated the excellent domain in technological terms and, in some cases, the manifestation of the integration of new extra tools to the institutional platform. Such is the case of the interviewee one and five, who mentioned being using tools such as Evernote, Edmodo, social networks and the use of electronic tablets.

These results are very similar to those obtained by the research of Imbernón, Silva and Guzmán (2011), where it was shown that teachers do not promote in their teaching the use of ICT, and more specifically, web search engines, e-mail, of blogs, wikis and other tools.

It is important to train teachers and students in the use of technological tools for the development of competencies for the selection and appropriation of resources that promote learning. In this regard, the United Nations Educational, Scientific and Cultural Organization [Unesco] (2008) mentions:

Achieving the integration of ICT in the classroom will depend on the ability of teachers to structure the learning environment in a non-traditional way, merge ICT with new pedagogies and encourage dynamic classes at the social level, stimulating cooperative interaction, collaborative learning and group work (p. 6).

From the results, it can be said that the teaching performance is related to the development of the students' competences. Planning, didactics, feedback and communication are competencies that impact the student's learning environment. Hence its importance in the development of positive skills of students in relation to analysis, synthesis, information management, self-management and ICT management. That is, to the extent that the teacher draws up his teaching strategies properly and assumes his role in the process of learning knowledge, understanding, application, analysis, synthesis, evaluation (assessment), will be ensuring a better academic performance of the young university student.

Conclusions

The results of the study showed that teachers recognize that, based on their competences, they can improve the student in the following aspects: planning, the management of the learning environment and the self-management evaluation. Equally important, the use of communication between teachers and students allows interaction and the development of skills. Thus, based on these results, it is concluded that an environment mediated by technology becomes a mobilizing agent of skills, abilities and values for the development of students' competences.

In addition to the above, environments of this kind require innovative teaching practices, focused on learning, which, in turn, makes it even more possible to develop competencies. It should be noted that not all teaching performance can be attributed to the competences of these, since there is also a relationship with the characteristics of the student and the factors associated with the environment. These results allow to better understand the educational practices, as well as propose improvements and make proposals in the processes of teacher training.

Finally, it is important to mention that the development of student competencies is a multifactorial process, where the teacher is a micro-system that interacts with other aspects of the system, such as the student's training, the institution, the educational model of the modality, the appropriation of technology by both actors, teachers and students, among others, all of which

potentiate the development of competences. Emphasizing, these results allow to better understand the educational practices in environments mediated by technology, propose improvements and make favorable proposals to the processes of teacher training.

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