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STUDY TO CARRY OUT THE TUTORIAL ACTION THROUGH A LEARNING MANAGEMENT SYSTEM AT THE SECONDARY LEVEL

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Abstract. The educational level of secondary school is the final stage of basic education in our country, which integrates the subject of tutoring as a process of guidance, management and support under the coordination of a teacher-tutor. Said educational process is carried out in order to strengthen the integral formation of the students. In this sense, the present descriptive exploratory research was carried out, addressing as problematic the analysis of the aspects to design a learning management system with the use of the Moodle platform as an accompaniment tool in the tutorial action. Thus, the mixed court study was carried out inside the school of the center of the José Anastacio Díaz López school chain (JADILOP) in the city of Zacatecas. The survey applied to 120 students was used for the quantitative analysis, using the SPSS program for the processing of the obtained data. For the qualitative approach, the semi-structured interview applied to 12 teacher tutors and 3 specialists was used, using the specialized software MaxQDA for the analysis and processing of the data based on the grounded theory. As main findings, the Moodle platform was identified with functional characteristics to carry out the tutorial action in an efficient manner as well as an environment that favors the link with the other subjects of the second year of secondary school program; where the aspects to be integrated in the design and implementatión are specified.

Keywords: Tutorial actión, learning management system, Moodle, instructional design, informatión and communicatión technologies.

ESTUDIO PARA REALIZAR LA ACCIÓN TUTORIAL A TRAVÉS DE UN SISTEMA DE GESTIÓN DE APRENDIZAJE EN EL NIVEL DE SECUNDARIA

Resumen. El nivel educativo de secundaria es la etapa final de la educación básica en nuestro país, el cuál integra la asignatura de tutoría como un proceso de orientación, gestión y acompañamiento bajo la coordinación de un docente-tutor. Dicho proceso educativo se realiza, con el fin de fortalecer la formación

integral de los estudiantes. En este sentido, se llevó a cabo la presente investigación exploratoria descriptiva, atendiendo como problemática el análisis de los aspectos para diseñar un sistema de gestión de aprendizaje con la utilización de la plataforma *Moodle* como herramienta de acompañamiento en la acción tutorial. Así, el estudio de corte mixto se efectuó en el interior del colegio del centro de la cadena de los colegios José Anastasio Díaz López (JADILOP) en la ciudad de Zacatecas. Se utilizó la encuesta aplicada a 120 estudiantes para el análisis cuantitativo, usando el programa SPSS para el procesamiento de los datos obtenidos. Para el enfoque cualitativo se empleó la entrevista semiestructurada aplicada a 12 docentes tutores y 3 especialistas, empleando el software especializado MaxQDA para el análisis y procesamiento de los datos con base en la teoría fundamentada. Como principales hallazgos se identificó a la plataforma *Moodle* con características funcionales para llevar a cabo la acción tutorial de manera eficiente así como un entorno que favorece la vinculación con las demás asignaturas del programa de estudios de segundo año de secundaria; donde se especifican los aspectos a integrar en el diseño e implementación.

Palabras clave: Acción tutorial, sistema de gestión de aprendizaje, *Moodle*, diseño instruccional, tecnología de la información y comunicación.

Introduction

Nowadays, the educational practice is benefited by the access to the use of technology in order to carry out the activities of the teaching work. This is due to the fact that there are different resources and technological tools that, through their functionality, offer support to facilitate learning management.

UNESCO (2015) highlights the standards of competencies for the use of Information and Communication Technologies (ICTs), proposing digital literacy, as the ability of teachers to generate successful practices with the use of ICTs that are characterized by the incorporation of innovative, interactive learning environments and the promotion of collaborative participation.

On the other hand, the OECD (2004) evaluates the member countries' efforts to strengthen access to information and knowledge management by proposing a distance education model. This model focuses on the teacher as a mediator, placing the student at the center of the educational process, who will also have the role of managing their learning.

It should be noted that the evolution of education in Mexico has been shown throughout its history as a living and significant discipline. The transformations in which it has been immersed and in which paths have been found to address and understand the pedagogical process has been very important. However, the issue implementing technology articulated with the educational environment is a process that deserves greater attention.

As institutional efforts, it is important to take into account the project called: *México Conectado*, that tries to provide coverage to technology in order to strengthen the process of interaction, communication, or collaboration with the purpose of diminishing the digital gap that is still very significant in our country.

> The Government of the Republic, through the *México Conectado* Program of the Ministry of Communications and Transport (SCT), is one of the main connectivity projects of the Government of the Republic. It has accelerated changes to enable children and young people in the country the possibility of connecting to the Internet for free (SEP, 2017, p.22).

In this way, current technological means have an impact on the different areas of our society, since they are used in different human activities. For this reason, digital

literacy requires being receptive to technological innovations to use them by expanding their potential. This stems from the following point of view: "the possibility of interpreting information, assessing it and being able to create one's own messages" (Avellano, 2013, p. 453). Therefore, this applies the sense of transforming educational practice towards an interactive and collaborative training within the teaching profession. This can contribute to the student's autonomy in their own learning process to benefit the implementation of innovative pedagogical models.

We should also mention that educational programs offered through technology provide elements to catch the student's attention by using interactive methodologies. This may provide evidence of benefiting the sense's impact, compared to the more static media (Avellano, 2013).

According to Rodriguez (2013), the use of the Moodle platform represents a very useful technological tool. It allows the use of different resources through a virtual setting that can be adapted to the different teaching-learning scenarios, with methodologies that enable managing the learning process, facilitating communication, collaboration and interrelationship between teachers and students.

The study by Toledo (2017) stands out regarding the research on the process of tutorial accompaniment with the integration of ICTs. He characterized the Spanish university context and virtual tutoring, stressing the importance of teacher mediation as no reform will be sufficient if there is a lack of conviction in tackling technology as a tool and means in the educational practice. Furthermore, one of the most relevant actions in the teaching-learning process is the motivational factor. This factor grants the virtual tutor the tools to develop the competences that this difficult task requires. These tools can offer possibilities and challenges of a procedural and attitudinal nature.

According to the authors Mirabal, Gómez and González (2014), the use of Moodle as a support for face-to-face university teaching requires the use of technological tools to improve the teacher's practice. It is also important to identify those desirable competencies related to managing files within web environments, as well as knowing how to interact with them to take better advantage of this platform.

Other important findings are those from López (2013) and García, Cuevas, Vales and Cruz (2012), who express positive influence in the use of *Moodle*, according to the degree of student and teacher satisfaction. Within these ideas, the relationship of tutoring with new technological settings where it is possible to adapt them to current educational trends is made explicit. Likewise, Ruiz's study (2014) shows that technological activity in the classroom is possible since technology is an effective manner that offers users a dynamic, open and distance learning. This type of learning can help improve efficiency and productivity in the classroom to achieve quality education. In this sense, Del Hierro, García and Mortis (2014), point out that one of the teacher's tasks is to be up to date so as to establish attractive activities for students but also activities in which they are offered the opportunity to learn.

Consequently, the contributions of the research by Rodríguez (2010), revolved around the theoretical basis of the use of the *Moodle* platform. As a contribution to knowledge, he adds strategies for the design of teaching material that can be used in virtual courses for the secondary and high school level. Evidence was provided on the use of this tool as an appropriate way to accompany the student and their learning process.

In this way, the interactivity encouraged by ICT aims to foster the improvement of educational quality through the diversity of content and models focused on the student.

The benefits of Moodle for teaching are, thus, given spotlight because it allows storing multimedia content (audios, videos, images, among others), as well as the facility to evaluate student tasks, create activities and teaching units that encurage self-learning and collaborative learning (Ros, 2008).

We should underline that there is a need to be clear on why ICT are going to be incorporated and about the way in which it will be shown in the tutorial classroom. This is to say, the importance of prior planning, including the form of interaction that will facilitate the process of tutorial action within the virtual setting. According to the definitions by Clarens (2013), when a virtual course is developed, the following functions must be fulfilled: managing the resources, the contents and the activities so that the education is transmitted in an organized way. Thus, Clarens emphasizes that the main characteristics of the learning management systems are: interactivity, flexibility, scalability, standardization, usability, functionality, ubiquity, convincing the user of the benefits of ICT, and accessibility as one of the most important aspects.

Bellorch (2017) states that an essential part for the development of a learning management system in virtuality is the instructional design (ID), which should enable linking the activities, the creation of the virtual learning environment, the structuring in the design and the integration of adequate tools.

It is important to mention that there are difficulties both in schools and in teachers due to the incorporation of technological ways of working, among which, we can highlight the lack of skills in implementing ICTs, as well as a fear and distrust on the part of teachers (Coll, 2011). Therefore, we can underline that:

> It is necessary that educators learn to value ICT not only as instruments to enable new systems of representation, but also as instruments that have transformed the culture of learning, since they can be used to design virtual settings that encourage the constructivist activity of students. Coll (2011, p.116).

Regarding this, González and Vélaz (2014), point out that the tutorial action is the orientation activity intentionally carried out by the teaching staff and especially by the tutor, in the exercise of their teaching duties. This may produce a continuous and individualized accompaniment of each student and group of students that can guarantee the integral development in the academic, social, personal and professional fields.

For this reason, the National Tutoring System of Mexico (SiNaTa) defines tutoring as:

> The academic accompaniment of students, from the time they commence until they finish their studies at the upper secondary level, is carried out by a teacher who takes the role of Group Tutor. This Tutor guides them, individually or in groups, in order to achieve efficient study, develop skills and study habits and deploy strategies to learn how to learn (SEP, 2017 p.14).

Having said that, it is considered that to guarantee results, tutoring should be continuous throughout the training process in educational institutions, with collaboration not only of educational entities but also with the support of parents and others involved. Therefore, it is thought that student will acquire the long-lasting basis to act responsibly as a citizen if this teacher-tutor's accompaniment is present during the student's education process. (García & Cano, 2010).

In this way, tutoring is considered relevant for the comprehensive formation of students, stating that the commitment and dedication of tutors is not enough, but also requires the approval of educational authorities (Munevar, 2012). In addition to a work where the following is highlighted:

> The tutorial accompaniment or tutorial action is the result of a previous system of pedagogical design and didactic planning. Its development also implies processes of preparation for situations, activities and events that facilitate launching the processes and results of the strengthened and activated learning (Munévar 2012, p.36).

Likewise, tutoring in the case of secondary education should be an integral accompaniment, where the student is oriented not only to learn a subject but to develop personal skills to face the challenges of the future. In this sense, Coll (2011) states that it is not enough to be a student with an excellent academic background, but to also develop the competencies that enable them to strengthen their creative potential and the full exercise of their personality. In addition, Coll emphasizes that the teacher's role depends largely on the dynamics and interaction with students and learning content.

Regarding the use of ICTs in the educational process, it is clear today that when the characteristics for their use are enhanced, it establishes itself as a basis for pedagogical action. For this reason, the present study places great importance on the Moodle platform, taking into account that it is an environment that enables the implementation of new experiences such as interactivity and collaborative work which can foster the design of attractive activities in accordance with the interests of students in the 21st century (UNESCO 2013).

In addition, there are very few studies today about the integration of ICT into the tutoring subject at the secondary level, which is why it is necessary to know the perceptions of students, teacher-tutors and experts on their incorporation into the community of the JADILOP school in Mexico. This school has the continuous collaboration of students, teachers, experts and managers of the institution who are substantive participants and who analyze and value the transformations that these media can bring to the tutorial action program.

The previous statement suggests the following research question:

How to design a learning management system that contributes to the practice of the tutorial action at the secondary level using the Moodle platform?

Method

An exploratory and descriptive research was carried out through randomized probability sampling in which "all individuals in the population can be part of the sample" (Casal, 2010, p.4). Therefore, the sample was formed by 120 students for the quantitative process. For the qualitative process, a theoretical sample consisting of 12 teacher-tutors and 3 three computer experts, was formed.

For the quantitative approach, the following hypotheses were contemplated: 1) The Moodle platform is a functional learning management system for the tutorial action; 2) The Moodle platform is a means that enables one to practice the tutorial action in a transversal way with the subjects of the second year of secondary school curriculum. As a data collection instrument, the survey used a questionnaire with closed questions designed from an operationalization table of variables with a Likert type scale. The

reliability of the questionnaire was obtained according to the Cronbach's Alpha test with a value of 0.84.

The qualitative analysis was carried out through the based theory which makes the application of semi-structured interviews to the tutors and experts explicit. According to Hernández, Fernández and Baptista, (2014), criteria were followed in order to obtain the scientific value of the research such as the dependence that refers to the adequate systematization carried out during the ground work and the use of different sources to obtain data. The MaxQDA software was used in this study, which was of great support to carry out the process in a more effective way. We can add to this the credibility of the researcher's ability to catch the reality of the informants' experiences, for which purpose the transcripts of the interviews with the informants were validated in order to verify that their conceptions had really been caught. Lastly, the transferability that, although in qualitative studies, the aim is not to generalize the results, "they can provide guidelines for having a general idea of the problem that is been studied and the possibility of applying certain solutions in another environment" (p. 458).

It is important to mention that the work had the approval of the institution Colegio del Centro JADILOP. At the same time, the autonomy of the participants was respected to guarantee their freedom of expression in the study. "Data collection is done in the natural and daily environments of the participants or units of analysis. In the case of people during their daily lives: how they speak, what they believe, what they feel, how they think, how they interact" (Hernández, Fernández & Baptista, 2014, p.409.)

Results

According to the results obtained in the quantitative analysis, the first hypothesis suggested that: The Moodle platform is a functional learning management system to achieve a tutorial action; it is accepted according to the perceptions identified in the students, as it is showed below:

As we can see in Figure 1, students considered that the tutorial action carried out through the virtual platform is an adequate means of accompaniment. Interactivity can be highlighted as an important factor of communication and interrelationship between the participants in the course. Opinions had favorable trends as expressed in the graph, with a standard deviation of 0.50 (Figure 1).

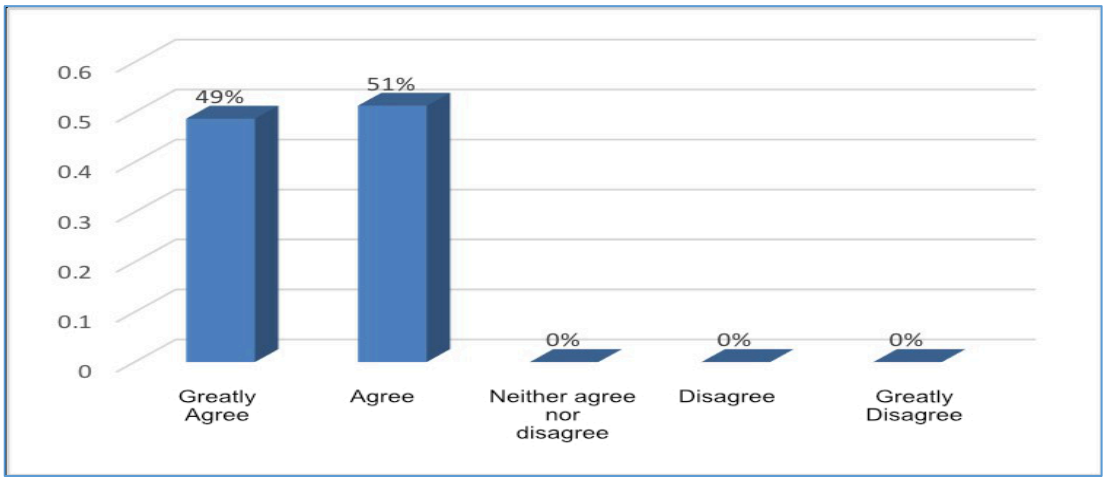

Figure 1. Tutorial action through the Interactivity in the platform
Note: Prepared with the SPSS program

Students see in a positive way the integration of multimedia resources into a virtual learning design, because in their opinion, it facilitates the educational orientation. This is favorably reflected with an average value of 4.36. Most informants accept that the integration of multimedia resources facilitates dynamic learning for a class in the platform.(Figure 2).

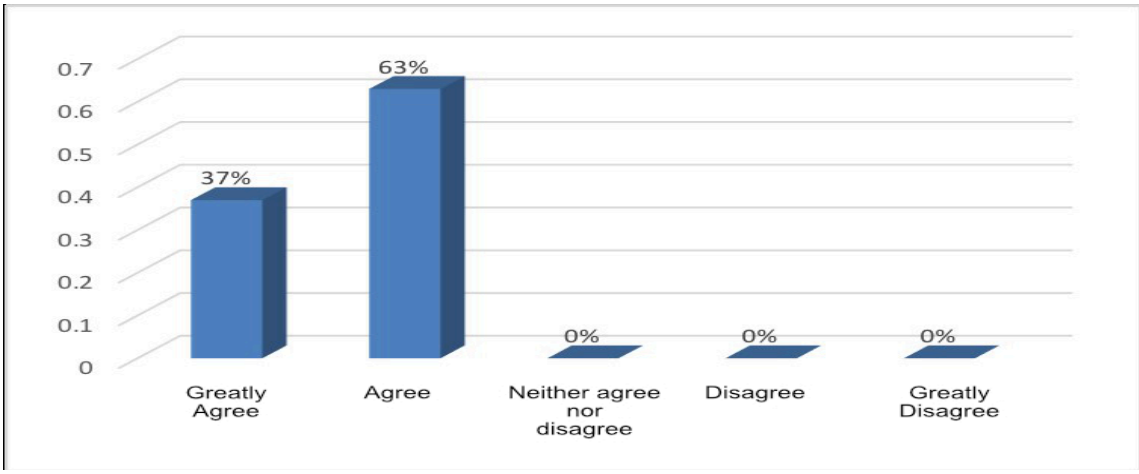

Figure 2. Integration with multimedia resources
Note: Source: Prepared with the SPSS program

Informants' perceptions of the learning ease with the use of the tool Moodle, set the mean in 3.37 . Regarding the use of ITCs, most of the students assure having carried out activities with technology as part of their training period. This result is placed with a standard deviation of 0.43.

For the item on learners' perceptions of preference for performing activities to support their learning process on a virtual platform, responses are placed with a standard deviation of 0.39. Therefore, incorporating ICTs in the classroom into the teaching-learning process requires new skills that teachers must acquire in order to take full

advantage of the benefits offered by these media and to fulfil the role of mediator of student's learning.

In relation to active participation, when using a virtual environment as a means of managing the tutorial action, students perceive it as an effective way, their responses have a mean of 3.75. And regarding the incorporation of activities to be carried out with different digital resources applicable to the tutorial action, the students expressed being in favor of incorporating new alternatives in which they could learn about digital applications in order to foster their learning, the mean was 4.36 and the mode 4.

About the functionality of the platform, to carry out activities in a collaborative way that foster interaction and communication between peers, the opinions are placed in a mean of 4.26 and a standard deviation of 0.46. This indicates that students perceive the virtual environment as a means in which they can establish greater interrelationship with their peers. Hence, the vast majority of students consider Moodle to be a viable platform for the tutorial accompaniment.

According to the second hypothesis: The Moodle platform is a means that allows tutorial action to be practiced in a transversal way with the subjects of the second year of secondary school curriculum. It is accepted according to students' perceptions with the following results:

When students were asked if they consider important to link the tutorial action with the other subjects they were taking, in order to provide them with support, guidance and monitoring of their academic performance, the results showed a standard deviation of 0.49. (Figure 3). This means that tutoring is part of the educational action and therefore should contribute to achieve a better learning level.

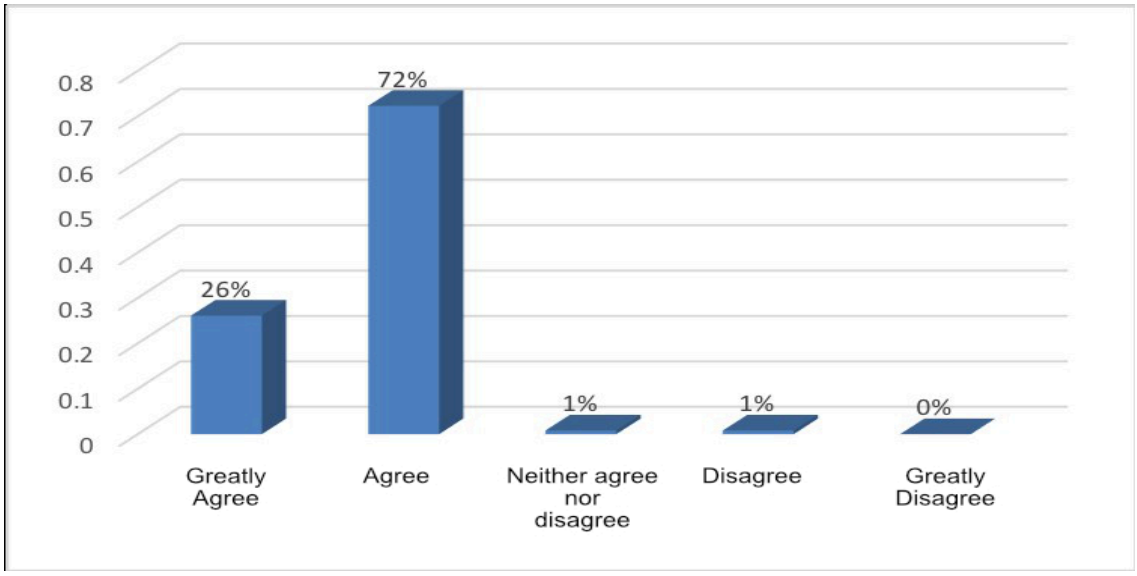

Figure 3. Tutoring as a support for other subjects
Note: Source: Prepared with the SPSS program

Besides, for the percentages of the students' perception of the role of the virtual tutor to address problems expressed in some subjects and identify weaknesses, strengths or areas of opportunity that contribute to their performance at school, the results had a standard deviation of 0.42. This means that the virtual tutor is recognized as the substantial body in the development of their specific functions such as supporting the learning process, contacting with families, among others.

According to the informants' perceptions, the tutoring action is possible when there is an opportune attention. This is reflected in positive results in the mean of 4.38 and the standard deviation of 0.48. It can be affirmed that Moodle has tools for attention and accompaniment for the students at any time, place and in correlation with the other curriculum subjects.

Regarding the qualitative analysis, four main categories were identified (Moodle platform, Teaching function, Pedagogical functionality and Tutorial action), as can be seen in figure 4. The thicker tables represent the greater importance in each subcategory of analysis.

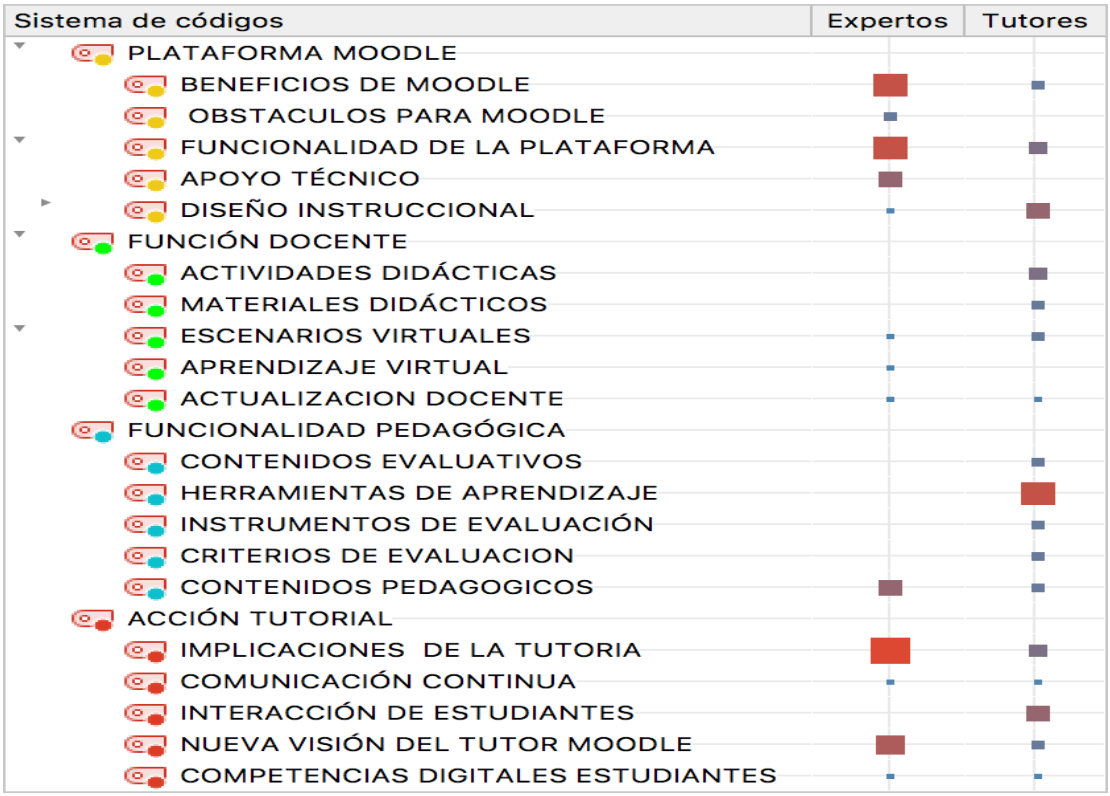

Figure 4. Matrix of categories and subcategories
Note: Source: Prepared with the analysis conducted with the MaxQDA program

Moodle Platform

Within the findings in this category of analysis, it is highlighted the greater importance that is given to the *platform functionality* and *Moodle benefits* subcategory, which is reflected in the thicker tables (Figure 4) and thicker line as can be seen in Figure 5.

In terms of *functionality*, the experts underline the importance of designing the environment to be friendly and intuitive, easy to use and correct for an easier access by users. They also emphasize the importance of the synchronous and asynchronous communication channels that help to accompany the students during the tutorial action process. Here, the organization, the contents distribution and the objectives structuring of the course are indispensable.

Regarding the benefits of using the platform, the experts mention the benefit of being an open source tool in order to meet the users' needs, as well as the ease of use at

any time and place. Thus, one of the tutors emphasizes that: "the platform allows to connect the study with the work and foster the relations of reciprocal enrichment. That is why students like to be there, because they continually communicate" figure 5.

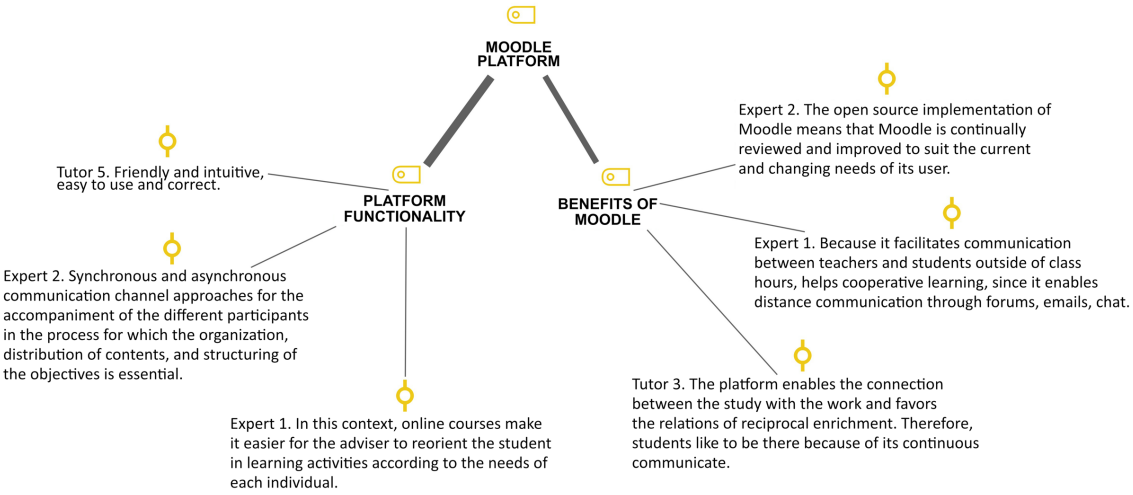

Figure 5. Map of *Moodle Platform* subcategories
Note: Source: Prepared with the analysis conducted with the MaxQDA program

Teaching Role

Within the findings in the second category of analysis called *Teaching function*, the subcategory *educational activities of learning* is reflected in the thicker line as shown in Figure 6.

In this subcategory, experts and tutors emphasize: the importance of the tasks and activities that the student must carry out to manage his learning, involving the teachers because it is no longer enough to have certain knowledge, but to foster interaction and collaboration. This is achieved by using strategies that strengthen collaborative work among students. This highlights the importance of developing a series of personal characteristics and basic teaching skills that optimize the development of their work, their interpersonal relations, and above all, greater meaningful learning of students.

Consequently, and from the pedagogical point of view, it is about seeking and identifying one's own activities that will make the learning objectives to be achieved.
In this sense, other subcategories that originated significantly are the *didactic activities and virtual scenarios* that foster the constructive and creative activity of the student, since it is perceived that the motivation to learn by doing is a way to promote learning, where the *teacher updating* becomes relevant. This is due to the fact that the teacher has the task of designing new educational approaches that are the appropriate response in order to achieve *virtual learning.*

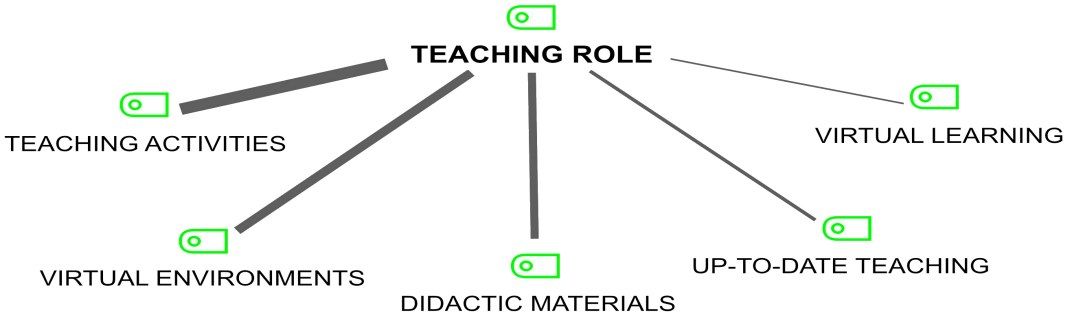

Figure 6. Subcategories of the category Teaching rol

Note: Source: Prepared with the analysis conducted with the MaxQDA program

Teaching Role

Regarding the *pedagogical functionality* category, that is to say the set of appropriate tools that serve as a means to carry out virtual teaching and learning (Suarez, 2013). It is organized into five subcategories: *learning tools, pedagogical content, assessment instruments, evaluation criteria, assessment content*, as shown in Figure 7.

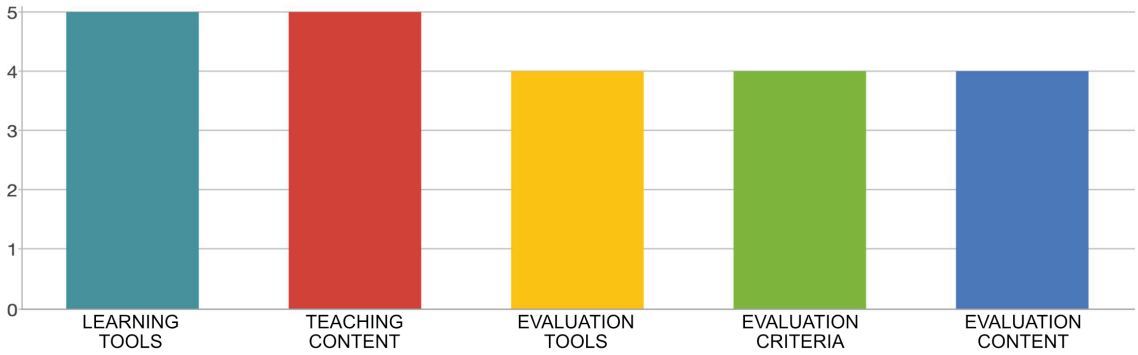

Figure 7. Results of the Pedagogical Functionality subcategories

Note: Source: Prepared with the analysis conducted with the MaxQDA program

Within the findings in the category of *pedagogical functionality* analysis, the subcategory of *learning tools* stands out, as shown in figure 7, where according to the opinions of tutors and experts, it was identified that for pedagogical purposes the most functional digital resources are forums, wikis and glossaries. These, at the same time, form the set of applications that open opportunities for educational organizations. We can reach the conclusion that learning and teaching are no longer limited to the classroom but are developed at any time of day and from anywhere, so it is important to adapt the resources so that this platform contains the basic functionalities.

As a result of the analysis of the study conducted and the application of the interviews, it was identified that in order to carry out this project it will be necessary to efficiently address the *pedagogical contents*. Such subcategory is shown with an equal importance as the first one that refers to the topics of an educational program, organized and structured in the planning of teaching, oriented towards a virtual learning.

In this sense, a pedagogical content must be elaborated in such a way that it fosters a meaningful learning. This implies offering students a set of necessary and specific activities in order to achieve this purpose, creating motivation and interest in students to carry them out.

Tutorial Action

As the fourth category the *tutorial action*: This is not an isolated activity, but rather a shared action involving the whole institution. The aim of this pedagogical work is tutoring, accompanying and monitoring in order to ensure that each student develops in the most favorable conditions possible (SEP, 2010). This category is divided into other subcategories that can be mentioned as: *implications of tutoring, new vision of the Moodle tutor, student interaction, continuous communication and digital competences of students* as shown in figure 8.

Within the findings of this category, we can highlight the subcategory entitled *tutoring implications*, where experts and tutors make comments about the tutorial action, as part of the process of teaching learning. Therefore, it should be in line with the principles and educational criteria, so the tutoring is valued as an efficient resource to serve learning.

Analyzing the data collected by the informants, represented in figure 8, the results reflect that the subcategory, *New Vision of the Moodle tutor* that is located in the second place in importance and it refers to the profile of the tutor who acts as a mediator in the exercise of the tutorial action. This tutor is considered to be an expert in the subject and to have also the basic knowledge in computer science, so that in case of not having technical support, he can solve any simple problem that is presented.

On the other hand, it is essential that the tutor teachers have the knowledge to select the adequate content and the learning resources that creates interaction, collaboration and communication in an active way. This should also promote the accompaniment of the students (ANUIES, 2014). The objective of the tutoring according to the meaning of (Romo, 2011):

> The process of accompaniment during the students' training which is specified through a personalized attention to a student or a small group of students, by competent tutors trained for this function and conceptually supported by the learning theories. (Romo 2011, 27-45).

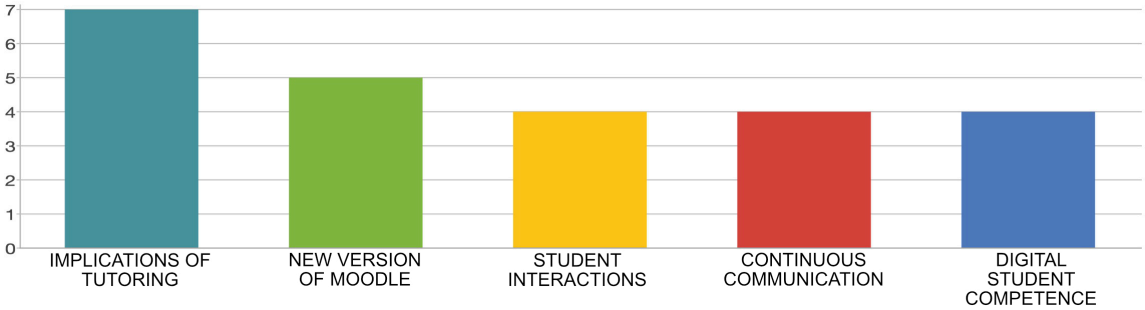

Figure 8. Subcategories of the Tutorial Action category
Note: Source: Prepared with the analysis conducted with the MaxQDA program

Discussion and Conclusions

From this research, relevant conclusions are drawn about the design of a virtual tutoring system in Moodle. These conclusions are based on the problems identified and addressed on the question of how to design a learning management system at the secondary level using the Moodle platform in order to contribute to the practice of tutorial action. It is underlined that the pedagogical elements that constitute a virtual environment in Moodle should be analyzed in order to enhance the tutorial action.

Therefore, it is concluded that it is necessary to optimize the pedagogical and didactic aspects in order to generate a virtual learning design that is attractive for the students. In this sense, Suarez (2013), Romo (2011) and ANUIES (2014) agree that even if we have a solid virtual platform, it is necessary to strengthen any activity or resource that contributes to the knowledge and training.

Regarding the hypotheses, they are corroborated, as they indicate that the Moodle platform is an effective way for carrying out tutorial action and that it is possible to manage learning and accompanying students virtually. This is achieved through optimization and interaction on the platform as well as the selection of appropriate digital resources for the development of teaching activities that generate interest and participation among students.

Likewise, it is underlined the need of a virtual learning system that is linked to the other subjects of the secondary school curriculum and that is integrated within the JADILOP schools in order to help in the integral formation of the students. Hence, it should be stressed that there should be continuous communication between teachers and tutors, in order to facilitate the transversality between the subjects taught.

Regarding the qualitative part of this research, results that contributed significantly were obtained, since categories and subcategories were identified. These categories define the characteristics to be taken into account for the design of the tutoring course with the *Moodle platform*, such as: aspects for the *pedagogical functionality*, implications of the *teaching function* and the particularities of the *tutorial action* for the effective accompaniment of the students, as can be seen in figure 9.

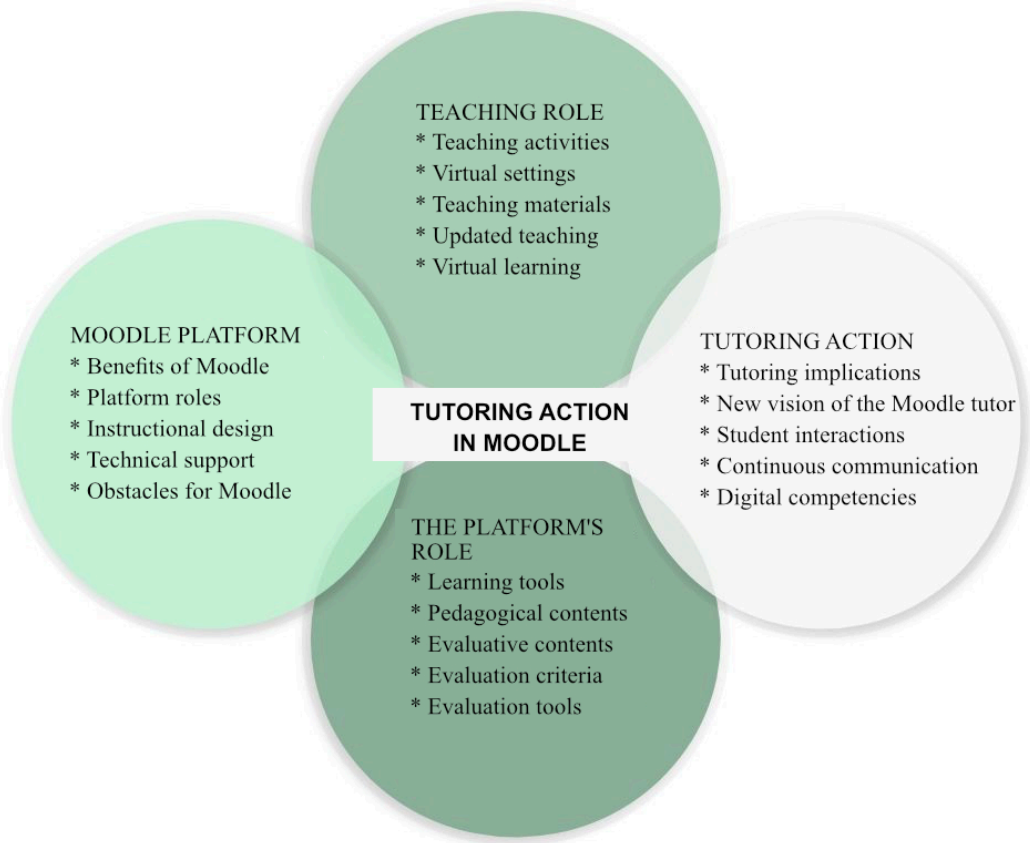

Figure 9. Tutorial action in Moodle
Note: Source: Prepared with the analysis conducted with the MaxQDA program

In this way, we have a proposal of the aspects to consider for the design of the tutorial course at the secondary level in order to strengthen the accompaniment of the students. We suggest linking the tutorial action in a transversal way with the other subjects of the study program. Although for the moment this research was carried out with second year secondary school students, it is intended to be applied to the other years of this level. This experience would allow the evaluation of the learning and the realization of the tutorial with the other students of the JADILOP school.

In addition to what has been commented, a future line of investigation, they specify the type of tools and resources that facilitate the tutorial action, as well as the impact regarding the levels of collaboration, interaction and virtual communication when carrying out courses through this modality.

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