

Application of the info-pedagogy through the collaborative tools

Aplicación de la info-pedagogía a través de las herramientas de colaboración

Jenny Maritza Rosero Lozano^{1,*}, Francisco Jorge Moran Peña^{1,‡}, y Allison Kimberly Kingman Rosero^{1,†}

¹Universidad de Guayaquil.

{jenny.rosero;jorge.moran;allison.kingman}@ug.edu.ec

Received: August 15, 2017 — Accepted: September 15, 2017

How to cite: Rosero Lozano, J., Moran Peña, F. J., & Kingman Rosero, A. K. (2018). Application of the info-pedagogy through the collaborative tools. *Journal of Science and Research: Revista Ciencia e Investigación*, 3(CITT2017), 10-14. <https://doi.org/10.26910/issn.2528-8083vol3issCITT2017.2018pp10-14>

Abstract — In this work, we report the results of a research carried out in a higher education institution where we applied info-pedagogy as an experiment in a class, the purpose of research is to evidence the impact of using ICT in the academic performance and to motivate its application in the most difficult subjects. was applied an experimental research with quantitative focus, It was created a website where it was published multimedia resources such as videos, pictures, text, elaborated with the ICT tools, Google Sites, Google Drive, Windows Movie Maker and Youtube, the data collected by means of a questionnaire created in Google form, applying an adaptation of the educational model of EEES. The results revealed that the application of the Inverted Classroom Learning based on problems”, “autonomous work”, they had good acceptance by students, It evidences a higher average grade of the experimental group (1.49 points) than the control group. In conclusion, the application of ICT tools facilitates the access to the curriculum contents and it helps significantly in the teaching process, It increases the level of motivation and interaction, and it forces and improve the academic performance showed in the report card.

Keywords—Info-pedagogy; Learning; ICT; Academic performance.

Resumen—En este trabajo se exponen los resultados de una investigación realizada en una institución de educación superior, donde se aplicó la Infopedagogía en una asignatura, el propósito de la investigación es motivar el impacto que tiene las TIC en el rendimiento académico, y así motivar su aplicación en las asignaturas con mayor dificultad de aprendizaje. Se realizó una investigación experimental con enfoque cuantitativo, se creó un sitio web donde se publicó recursos multimedia como videos, imágenes, texto, elaborados con las herramientas de las TIC, Google Sites, Google Drive, Windows Movie Maker y YouTube, la recogida de los datos se realizó mediante un cuestionario creado en Google Form, aplicando una adaptación del modelo docente del EEES. Los resultados revelaron que la aplicación de las estrategias de enseñanza mediada por las TIC: “aula invertida”, “aprendizaje basado en problemas”, “trabajo autónomo”, tuvieron buena aceptación de parte de los estudiantes, evidencian mayor promedio del grupo experimental (1.49 puntos) que el grupo de control. En conclusión las TIC facilitan el acceso a los contenidos curriculares, ayudan significativamente en el proceso de enseñanza, incrementan el grado de motivación e interacción, fortalecen y mejoran el rendimiento académico reflejado en las actas de calificaciones.

Palabras Clave—Infopedagogía; Aprendizaje; TIC; Rendimiento Académico.

INTRODUCTION

The technological evolution, the information and communication impact (ICT) is evidence in most of the professions, it is because of this that is applied in Graphic Designs through Photoshop, Flash, Illustration, in which you can correct imperfection in the design, thanks to this programs is that drawings in paper with ink, are not necessary; in the medical field has to increase advances in the biomedical and biotechnology who had increase new equipment and procedures; also is applicable in the 3D printer with organs to be transplanted or for medical experiments. In the civil engineer, field allows the support in the construction changes, measures and designed in the infrastructure. In financial area allowed the organization and the company management. The ICT has become in a determined that strengthen, the capacities to solve worldwide problems that arise nowadays our world.

The ICT play an important role in the learning process, according to Díaz (2014), the author states that because of the easy access and the variety of tools that help to overcome the temporarily-space barriers, besides the software's based on ICT can be converted in powerful tools that promote the collaborative learning, participative, based on projects were the teacher stop being the center of attention and convert himself to a facilitator of the information necessary and a guide constructivist learning (Cruz Meléndez et al., 2012), (Carrascal Torres et al., 2009).

The info-pedagogy, is the integration of ICT with the syllabus, through the application of pedagogic models appropriate in the teaching and learning process and not to the technology used of ICT in education. Is in this sense that the Ecuadorian state promote the application of constructivist pedagogic model focused in the acquisition of student's competencies, same as Constitutivos & Ecuatoriano (2008) which state in his article 347, numeral 8, in the part of the responsibilities of the State express; “Incorporate the technologies of information

*Licenciada en Informática, Magister en Informática.

‡Licenciado en Informática, Magister en Informática.

†Egresada de la Carrera de Lenguas y Linguísticas.

and communication in the educational process and allow an enhancement of the teaching activities with the social and productive ones”.

Within this frame, the UNESCO, consider that teachers must be: competent to use information technologies; to search, to analyze, to evaluate information, to solve problems and make decisions; to be creative users and effective with productivity tools: also, be communicators, collaborators, publishers, and producers (UNESCO, 2013).

The the teaching-learning process must be aligned to the knowledge acquisition, abilities and strategies in order that students will be able to interact with the society.

Taking in consideration all of this, the proposal is to implement the Web Tools 2.0 in the learning process, which the main objective is that the students inside and outside the classroom will be able to use the different resources that the teacher allows them to use throughout Google Drive and Google Site. Therefore, when the students enter to their classroom, carried intellectual, instrumental, and conceptual resources that will allow activities to create and to design with their classmates work individually or in groups in which the teacher will be learner facilitator. Consequently, we not only use the basic skills such as remember and comprehend, stated in the traditional model, but also, we aspire to other from superior order, such as create, evaluate, design and perform.

The present investigation is based in the constructivist theory of Jean Piaget, which propose a paradigm where the learning process is perceived and perform like a dynamic process, participative and interactive in a way that the knowledge will be an authentic construction operated by the person you are learning with (Piaget, 1968). In the significant learning from Ausubel (1998), the one that considers that all the previous knowledge that students have are the base to build new knowledge, in order to merge both. The active strategies of learning from Diaz Barriga, manifest that the teacher must be able to apply teaching strategies that produce significant learning in the syllabus (Díaz Barriga Arceo, 2005).

This study establishes the following question: Does the info pedagogic application allow a significant learning that it is evident in their academic performance? The principal objective is to describe and to evaluate the impact that produced the use of ICTs in the teaching-learning process (Prendes Espinosa et al., 2008).

METHODOLOGY

Context

An experimental research was carried out with a quantitative approach, (Hernández et al., 2006), applied during the academic period 2017 - 2018, within the framework of the subject “Computación 2”, parallels “A” and “B”, which is taught in the third cycle, of the “Biology career.

Participants

A non-probabilistic sample was obtained Sampieri and Collado (2010), 19 students participated from the grade “A” converting them in the experimental group, and 14 students from the grade “B”, converting them in the group of control, besides two teachers that work in the same subject.

Data collection

The methodology used in order to collect the data was through a questionnaire applied by a google formulary, it allowed 15 questions grouping the different dimension such as “ICT applicable to the learning process” “preference in the use of tools” and “academic performance”. The items in the questionnaire are based according to the Likert scale that state 5 values of punctuation that comprehend 1 for very disagree and 5 as extremely agree. In order to perform the data analysis, the computer program “Infostat” in it school version was used (2017 version), we analyzed the scores obtained in the final transcription correspond to the first semester period 2017-2018. Moreover, it allowed us to fulfill a parametric analysis between the Info Pedagogy and the Academic performance throughout the correlate Pearson coefficient application, (Hernandez Sampieri et al., 2010).

As a methodology to measure the academic performance, we performed the following actions:

1. A design was created and implemented in a website through Google Sites. Files were saved to Google Drive. Also, videos were created, edited and published on Youtube.
2. Didactic strategies were applied such as Flipped class, learning based on programs and Autonomous Assessment.
3. Through the official transcript, the academic performance was evaluated.

RESULTS

Survey analysis

According to the surveys elaborated and applied by Google Form, the results evidence a high interest from the students and their good acceptance to receive Web tools on Google sites and Google Drive which seem it was their favorites (Figures 1 and 2).

The results of the item “Select the collaborative tool for content published in which you feel more comfortable to work in class” (Figure 1), The group of control 14,3 % correspond 2 people are more directed to Blogger. 71.4 % corresponded to 10 people that decided Google Sites and 14 % decided Wiki. The experimental group confirmed the 15.8 % 3 of them decide Blogger, 68.4 % corresponded to 13 people who decide Google sites, 10.5 % correspond to two people who go for Wiki 5.3 % that corresponds to 1 person who decides for another option.

“Select the collaborative tool to save information in which you feel more comfortable to work in class” (Figure 2). Group

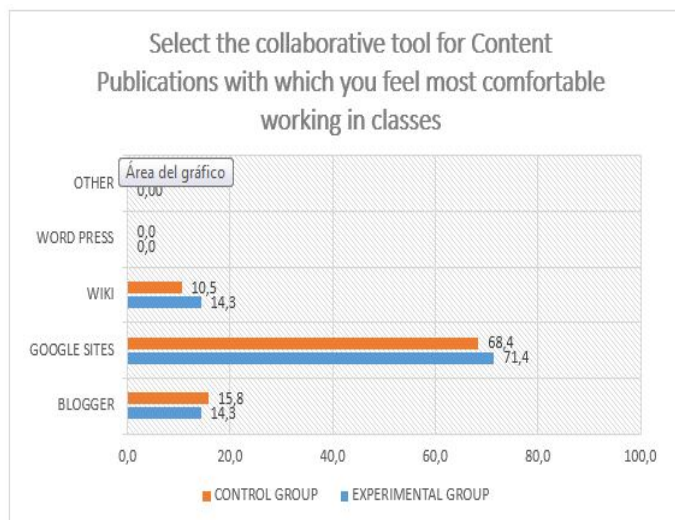


Figure 1. Survey applied to students of the experimental group and the control group.
Source: Prepared by the authors.

of Control 100 % that correspond 14 people decided Google Drive. Experimental Group 89.5 % that corresponded 17 people who decided Google Drive. And 10.5 % that correspond 2 people that are more into to One Drive

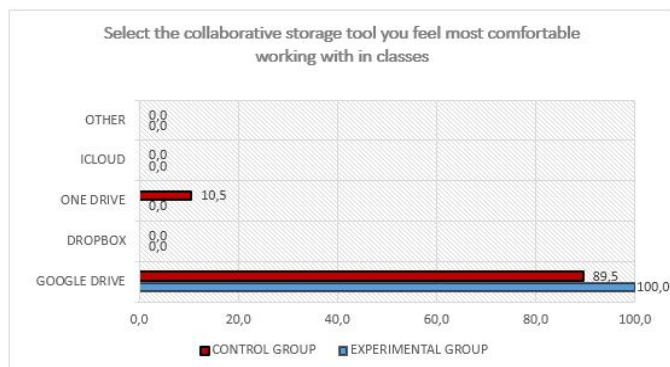


Figure 2. Survey applied to the students of the experimental group and the control group.
Source: Prepared by the authors.

Official transcript analysis

The information obtained in the official transcripts reveals:

The average of the experimental group in their first semester is 8.78 points (Figure 3), different from the control group whose average is 7.29 points. It is evident that there is a difference of 1.49 points.

In the experimental group, the 95.45 % of the students obtained grades over 7 points and barely the 4.55 % obtained grades lower than 7 points. On the other hand in the control group, 66.67 % of the students scored grades below than 7 points. In conclusion, we were able to prove that the students who received the Websites class, which was the experimental group

who register the highest scores, while a minimum percentage obtained lower grades which were the control group.

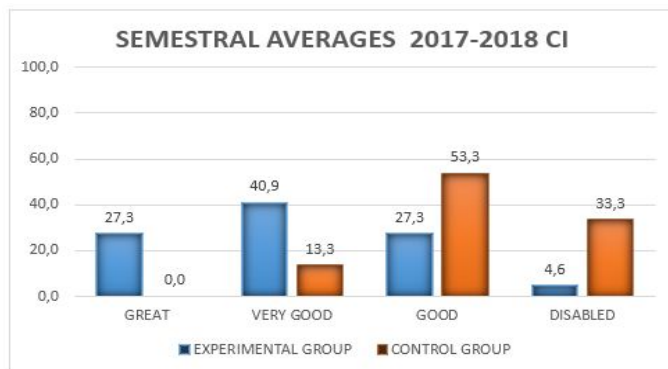


Figure 3. Averages experimental group Vs control group.
Source: Prepared by the authors.

ANALYSIS AND IMPLEMENTATION FROM ICT RESOURCES IN THE TEACHING – LEARNING PROCESS.

Conceptualization

1. Google Site, is a tool that allows creating simple web pages without having previous knowledge of HTML, its free and its available on the Internet, for its implementation, you don't need any special software or hardware. Google Sites, allow creating their own sites with the online collaboration. Sharing and organizing all kind of information from links, calendars, videos, pictures up to other contents such as Google Picasa, Google Videos, Google Doc.
2. Google Drive allows saving more information, (Figure 4). It is a product that allows users to save in a specific way all their file. (Google Doc) synchronically their files in one gadget: Web users such as Gmail. Google Drive and Mobile APP. All of this support Documents, images, presentations, excel, and formularies. Google Drive has updated all its files automatically so that the user can make any modification if it's necessary. Besides it also offers multiple ways to have everything in order and search for a file.

It user counts with a space of 15 Gigabytes free to save all its file through a way of payment. The files update automatically. In this research folders were created according to each topic, links, publications, and file to develop the practice of it in both ways, individually and collective.

3. YouTube (Figure 5) is a service that allows upload videos, from the internet. The terminology comes from the English word "You", that means "Tu" and "Tube" that means channel, thus this is channels created by users everywhere to share their videos, in an easy way.
4. Creation and Sharing of files in pdf, doc, xls, ppt, jpg formats. In informatics, a file is a group of structured data, that

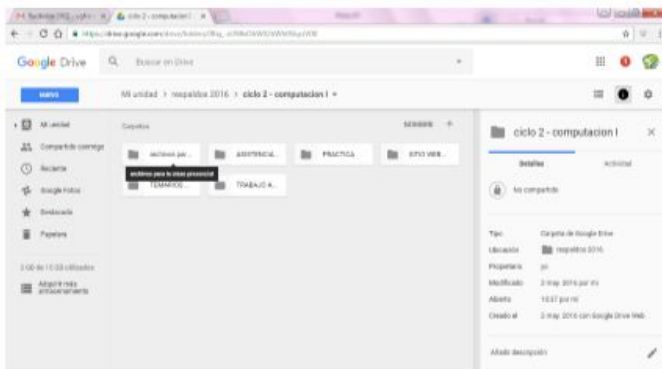


Figure 4. Documents stored and shared using Google Drive.

Source: Prepared by the authors.

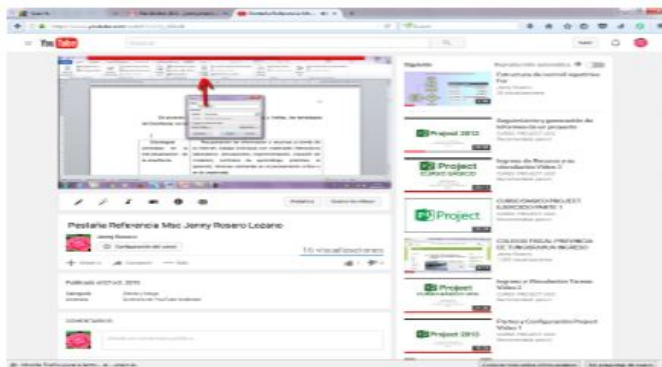


Figure 5. Publication of Videos on YouTube.

Source: Prepared by the authors.

is saved somewhere. It has the following characteristics: Name, extension, size, description, location, and format. Or it could be text, executable, data, images, audio and videos.

ANALYSIS OF THE APPLICATION OF THE WEBSITE

The activities worked by applying the didactic strategies through the Web, allowed the following results.

Qualitative: It has a good acceptance by the students is less time, they familiarize with the new work due to the fact that they born in the technological era. Also, we were able to see an active learning environment, the students develop correctly the exercises proposed, and we perceived lots of enthusiasm what contribute to a nice environment in order to obtain a significant learning (Carrascal Torres et al., 2009).

DISCUSSIONS

Throughout the study it as evidence that the inclusion of ICTs in the academic process easily the teachers work, it helps to acquire more knowledge, abilities, and competencies by learning. Also, it provides interactive classes, allows a special communication gap between teacher-student and student-student outside the classroom in a way that the students are always willing to study in an autonomous way.

Moreover, this result is a coincidence with Jean Piaget Constructivist theory Bonilla (2011), “emphasized in the activity that the person is doing, in the process of building a knowledge. This focus on the academic methods that allow the experimentation, reasoning, and cooperation”. This proposes a paradigm where the teaching-learning is perceived and is developed like a participative process, dynamic and interactive. Because of this, the knowledge is an authentic construction operated by the person who learns.

According to, that manifest that the teacher must be able to apply a teaching strategy in order to produce a significant learning according to the school syllabus, in which the teacher must improve the opportunities to the students. Ramirez Salguero (2001), considered that it is timely to apply didactic strategies in order to facilitate the acquisition of contents according to the education that demands more the use of the ICTs.

In addition, the new technologies can reinforce the contribution of the pedagogic and didactic works, due to the transmission of the information, up to the interactive dimension which is in charge of the tool-software producers.

The learning outcome is produced by the interchange and the social interaction, promoting and construction and reconstruction of knowledge through strategies in virtual sceneries (Costa et al., 2015).

López Murillo (2013), Gil Flores (2014), inquire in the relationships that exist between the Learning strategies and the academic performance and explain that the academic performance is the fulfilling of the objectives and the goals established in their professional Carrier that can be assured in a quantitative way that is evidentially in the official transcripts.

CONCLUSIONS

In conclusion, the use of the ICT in the university education, is a new resource, that motivate and make it useful in order to make this process adequate for the teachers who should create, plan, integrate all new types of pedagogic innovations and new methodologies that the technological tools don't make by their own, because this relies on the Teachers.

Furthermore, we were able to prove that the use of ICT, increase the interaction between students and teacher, the class environment becomes more dynamic, and richer in experience Rosero Lozano (2016), the students participate in the construction of their own learning at the same time meanwhile the teacher guides them through the process and construct the knowledge. Finally, we consider that the ICT is supporting favorably the teaching-learning process.

BIBLIOGRAPHIC REFERENCES

- Ausubel (1998). LA TEORÍA DEL APRENDIZAJE.
Bonilla, L. T. (2011). *Constructivismo pedagógico: Estrategias de enseñanza de maestras y maestros del sistema de*

- educación pública de Puerto Rico*. University of Puerto Rico, Rio Piedras (Puerto Rico).
- Carrascal Torres, N., Alvarino Bettín, G., and Díaz Buitrago, E. (2009). Estrategias mediadas por tic para el desarrollo de enfoque de aprendizaje profundo en estudiantes universitarios. *Revista Folios*, (29).
- Constitutivos & Ecuatoriano (2008). Constitución de la república del Ecuador 2008.
- Costa, S. R. S., Duqueviz, B. C., Pedroza, R. L. S., Costa, S. R. S., Duqueviz, B. C., and Pedroza, R. L. S. (2015). Tecnologias Digitais como instrumentos mediadores da aprendizagem dos nativos digitais. *Psicologia Escolar e Educacional*, 19(3):603–610.
- Cruz Meléndez, A., Alfaro Rivera, J. A., and Ramírez Montoya, M. S. (2012). Objeto de aprendizaje abierto para la formación docente orientado a desarrollar competencias de pensamiento crítico con énfasis en habilidades cognitivas. *RIED. Revista iberoamericana de educación a distancia*, 15(1).
- Díaz, F. (2014). Las tic en la educación y los retos que enfrentan los docentes. *OEI, Organización de Estados Iberoamericanos*. Recuperado de: <http://www.oei.es/metas2021/expertos02.htm>.
- Díaz Barriga Arceo, F. (2005). Desarrollo del currículo e innovación: Modelos e investigación en los noventa. *Perfiles educativos*, 27(107):57–84.
- Gil Flores, J. (2014). *Metodologías didácticas empleadas en las clases de ciencias y su contribución a la explicación del rendimiento*. Ministerio de Educación.
- Hernández, R., Fernández, C., Baptista, P., et al. (2006). *Metodología de la investigación*, volume 4. México.
- López Murillo, E. G. (2013). Factores que inciden en el rendimiento académico en el área de Matemáticas de los estudiantes de noveno grado en los Centros de Educación Básica de la ciudad de Tela, Atlántida. page 142.
- Piaget, J. (1968). Perspectiva constructivista de Piaget. pages 262 – 305.
- Prendes Espinosa, M. P., Martínez Sánchez, F., and Gutiérrez Porlán, I. (2008). Producción de material didáctico: los objetos de aprendizaje. *RIED. Revista iberoamericana de educación a distancia*, 11(1).
- Ramírez Salguero, M. A. (2001). Las Estrategias del Aprendizaje.
- Rosero Lozano, J. (2016). Las tics aplicadas en la educación y su correlación en el rendimiento académico. *Journal of Science and Research: Revista Ciencia e Investigación*, 1(CITT2016):49–52.
- Sampieri, R. H. and Collado, C. F. (2010). M. d. p. baptista lucio. *Metodología de la Investigación, Quinta ed., México DF, DF: McGrawHill*, page 613.
- UNESCO (2013). Enfoque Estratégico Sobre Tics En Educación En América Latina Y El Caribe.