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REVIEW ARTICLE

Review of the influence of Teacher Motivation in the Use of Interactive Whiteboards

Revisión de la influencia de la motivación docente en el empleo de las pizarras digitales interactivas

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Summary

The present article is a topic´s revision and it pretends to give a general vision of the recollected data about the use of interactive digital boards in the sessions of teaching-learning process´ development that takes as a determinant factor the teacher´s motivation. It has been made an examination of the available literature online to elaborate an analysis of the actual situation of this innovating didactic tool and its relation with the teacher´s predisposition, as part of the final project for the Academic Investigation subject in the Technological University of Peru. After the investigation, it concluded, until the edition's date, there are no enough researches that center their attention in the teacher´s attitude, especially in Peru, so it can´t be determined if there is a direct relation between these aspects and it´s recommended to develop projects that gives relevance to the educator in the efficient use of the technology with the purpose of achieve a qualified education that is adapted to the emergent information society´s standards.

Keywords: Education and Technology; Teacher´s Influence; Motivation; TIC; Technological Resources.

Resumen

El presente artículo corresponde a la revisión de un tema que pretende otorgar una visión general acerca de los datos recabados sobre el uso de las pizarras digitales interactivas en el desarrollo de las sesiones de enseñanza-aprendizaje que toman como factor determinante la motivación de los docentes. Se realizó una examinación de la literatura disponible en línea para elaborar un análisis de la situación actual de esta innovadora herramienta didáctica y su relación con la predisposición del pedagogo que la emplea, como parte del proyecto final para la asignatura de Investigación Académica en la Universidad Tecnológica del Perú. Luego de la investigación, se llegó a la conclusión de que, a la fecha de edición, no existen suficientes investigaciones que centren su atención en la actitud del profesor, sobre todo en el Perú, por lo que no se puede determinar a cabalidad que exista una relación directa entre ambos aspectos y se incentiva a desarrollar proyectos que consideren la relevancia del educador en el empleo eficiente de la tecnología con el fin de lograr una educación de calidad y adaptada a los estándares de la sociedad de la información emergente.

Palabras clave: Educación y tecnología; Influencia del profesor; Motivación; TIC, Recursos tecnológicos.

Introduction

In recent years, there has been an imminent need to access to technology in all senses, from which the necessary information is obtained to develop several activities, specifically, educational activities. Given such scenario, many initiatives of improvement have been appreciated by teachers who have presented interesting proposals of implementation to facilitate such process. These methodologies integrate, in a timely manner, the use and application of technological tools that bring students closer to existing global data for the optimization of their abilities and the daily educational practice. This is explained in the contemporaneous work of Prensky (2001), who stated that the new generation "has born and has raised using the particular "digital language" of computer games, video or Internet" (p. 5). This new society often has "the feeling that many contingent foreigners, who speak unknown languages, numerous foreigners with very good will, but unintelligible, have arrived at the classrooms to instruct them" (p. 6). For that reason, it is very necessary to update this individual within the educational routine. This demand strategically implies the slightly exclusive qualities of the Internet society that is characterized by its unequivocal desires to "receive the information in an agile and immediate manner and to learn in a playful way rather than learning under the rigorous traditional method" (Prensky, 2001, p.6); as well as by its interesting attraction to "multi-tasks and parallel process, graphics more than texts

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and random processes (from hypertexts)", since they work better and perform better when working online under " the awareness that they are progressing, which gives individuals satisfaction and immediate rewards" (p. 6) that can be applied to teachers and students.

For that reason, there has been an increasing curiosity about the use, application, benefits and disadvantages of the Information and Communications Technologies (ICTs). This has happened as a result of the convergence of technologies and markets and of the advances resulting from the economic and political globalization. In view of such outlook, it has been shown that "technology is not a resource frequently used, but rather an article that is stored in warehouses or in rooms of little use" (Peña, 2014, p. 10); compared to other ICTs. For Duan (2010) "the singularity and interest of the IWB are found in the possibility of achieving an intersection between the technical and pedagogical interactivity" (p.144). Although there are studies that analyze the attitude of the teachers towards the use of the ICTs, their aim is to identify such attitude, determine its causes and/or categorize it, without analyzing its effect. That is, few of them include the predisposition of the teachers to their use as one of the multiple factors that can determine their pertinent incorporation into the classroom.

For that reason, a discussion about the empirical possibility to establish a direct relationship in the interaction between teacher motivation and the pertinent use of the technology, specifically the Interactive Whiteboard (IWB) is proposed, since some research works state that the positive or negative predisposition of the educator has an essential role in his practice. Consequently, it would be observed if the students correctly or equivocally adopt what their mentor wants to transmit through the good or bad use of such tool.

The idea of intervening in the positive or negative results of the teaching practice with respect to the students is closely related to the concept of *influence*. Dahl (1985) defines it as "a relationship between actors, in which one of them induces others to act in a way that they would not do it otherwise" (pp.103-104). Then, in the pedagogical field, it is understood as a close relationship between educational agents, in which teachers perform actions that require the students to proceed in a certain specific way according to the achievement that they wish to reach.

Based on this work, a bibliographic review about the research works on the topic developed in the last decade is conducted, since work about this topic were not found in Peru. Those works internationally prepared to give a holistic approach and promote the application of knowledge acquired in other countries and apply it, previous adaptation to the Peruvian reality are considered. For that purposes, factors related to their facilities and impediments that have been observed are reviewed in order to motivate future studies, manage the optimization of the employment of such tool for the adaptation to new demands of a society of knowledge under a technological approach in the current education.

Preliminary Concepts

Teacher Motivation

One of the necessary expressions to understand this work is also teacher motivation. This concept has several implications. However, since they are mostly empirical, it is very complex to define it without falling into a value judgement of what it addresses. Despite this difficulty, some of the conceptions that have been conducted in several research works on motivation in general are expressed. Reeve (2012) explains that motivation covers everything that attributes to energy and direction to behavior.

In this regard, Ryan and Deci (2000) describe it as what guides an action and therefore, the important role in the training of people in charge of mobilizing others in the execution of an activity such as teachers, leaders or parents. Under the educational approach, the teachers' roles are considered as modelers or instructors. In this regard, Niemiec and Ryan (2009) refers to the

fact that motivation "is relevant in the education field, where the natural interest of the student in learning represents a great resource for the educator in order to encourage learning"(p. 134). So Luna (2006) suggests that such concept implies "thinking that the teacher must do a series of activities that stimulate the student emotionally and intellectually to conduct learning activities, obtain their results and future consequences" (p.29).

Based on the foregoing, it is inferred that this concept is a characteristic that the pedagogue acquires to actively maintain a quality educational practice and that it is transmitted to students in order to reach the achievements expected regarding their cognitive, psychological and attitudinal training.

Interactive Whiteboard (IWB)

In the educational field, there are many didactic tools that facilitate and optimize the teaching practice. They can be structured or not structured, which means that they are prepared in series and with the same characteristics or are prepared by the own teachers, adapting them to the educational reality they perceive. With the passage of time, these resources have been replaced by others that were easier to transport or that are permanently located in the classroom and are available to be used at any time. The more pertinent option and according to the *boom* of the Internet is the technological devices, such as computers, tablets, cell phones, multimedia projectors, among others.

Based on these elements, instruments that link to or integrate in one or more above-mentioned instruments have been designed. Thus, it was possible to develop a structured material that is also a set of technological tools that can be implemented in the classrooms to replace the traditional chalkboards or acrylic whiteboards by IWB. According to Corrales (2015) "the IWB can be defined as a technological tool, basically composed of a sensitive screen of different dimensions, a multimedia computer and a projector" (p. 161). According to Murado (2012) "it is about a system composed of a computer and a video projector that allows showing on a surface a series of digital contents" (paragraph 8). So IWB is understood as a system integrating a computer, multimedia projector and a sensitive screen in which you can use the fingers to write or a special pointer that presents a content that can be manipulated from the computer in order for the students to interact with the world.

Information and Communications Technology (ICT)

This concept refers to a knowledge recently acquired of the mass computer development that has been experienced in the last decade. For that reason to classify the variable defined in the previous section in a general classification, even more general than that of educational resources, the IWB and the other tools with structuration and common purposes are located in the ICTs. They are defined by the United Nations Development Programme (PNUD, 2002), cited by Daccach (s.f) as:

> The universe of two sets represented by traditional Communications Technologies (CT), mainly composed by radio, television and conventional telephony, and by Information Technologies (IT) characterized by the digitalization of the technologies of the content of records (informatics, of communications, telematics and of interfaces ,) (p. 1).

The Telephone Information Society, as cited in Sánchez (2008), defines the ICT as "technologies that are required for management and transformation of information and in particular, the use of computers and programs that allow creating, modifying, storing, protecting and recovering this information" (p. 156). These perceptions synthetizes the ICTs as a means of continuity and transmission of the available information in the society of knowledge to guarantee

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their exposition to the rest of citizens of the scientific community and, allow the development of even more contents.

ICT-based Education

After explaining the concepts of teacher motivation and the ICTs, it is appropriate to highlight a process that links them closely and concretely to specific results motivated by all the agents involved, that is, in this point, it is considered the concept of training under the application of the ICTs to develop the competencies inherent to this technological vision. To that effect, it is precise to take into account what Martín (2009) highlights by saying that:

> The change of the teacher's role, from keeper to guide of knowledge; the principle of learning to learn as the backbone of the cognitive model; the interaction of the individual and group, pillars that support this vision of learning, join in a suitable manner with the uses and models the ICTs offer and in a special way, Internet. (p. 55).

Based on the foregoing, the teachers' role is key in the implementation of technological devices that speed up their performance in the classroom. It is important to understand the learning model that implies the incorporation of the ICTs. Gatica and Valdivia (2014) define them as "those that allows students to actively participate in a collaborative learning where the creation of situations that promote sharing learning objects contribute to enrich the educational process significantly" (p. 203).

In accordance with the foregoing, we continue emphasizing on the teacher as an essential driver of change to establish this educational approach that implies necessarily the need to instill the learning autonomy in the students, as well as to show the demand of a change in the administration and conception of education "focusing in training people who manage their own learning, adopt an increasing autonomy and have intellectual tools that allow a continues learning through life" (Díaz, 2009, p. 139) and achieve the so desired goal.

Argumentation

Climate of the Classroom and the IWBs

A PhD thesis presented in Spain proposed the development of 6 learning sessions in a 27-student music classroom with the use of an interactive whiteboard to prove the influence of this tool on the climate of the classroom. In this regard, Monreal (2013) details that "not only training is important, but also, in a determinant way, the mentality of the teacher, his flexible character and his ability to implement the risk culture in the classroom" (p. 224). The methodology used consists in the direct application of instruments for data collection such as the preparation of formal and informal interviews, field diaries, and explicit observation, among others. After the experimentation, several difficulties, such as technical deficiencies of this tool during the classes were evidenced, but the improvements in the environment such as the change of attitude of students and teacher are highlighted, since as stated by the author:

It is important to keep in mind that the true methodological innovation starts with the teacher. He must be the promoter of such change, since without his willingness and open and reflective attitude towards other teaching methodology, there can never be a true technological innovation approaching the social reality. (pp. 36-37).

Eight macro-categories were selected and they addressed the criteria to be evaluated based on the specific dimensions of the study variables. Each one of them was composed of questions that allowed giving a certain opinion in the final score 232 of each aspect. Basically, it is described as a qualitative research based on a study of unique cases that concluded with the relative rejection

of the preliminary proposal, since a coherent and effective curricular integration of the IWB as a didactic resource was not conducted. “This can be due, on the one hand, to the lack of creativity of the teacher, and on the other hand, to the lack of time to generate didactic resources adapted” (Monreal, 2013, p. 232). Both reasons are due to the poor motivation of the teacher, since according to what Gatica and Valdivia (2014) “the interactive whiteboard promotes the flexibility and the spontaneity of the teachers” (p. 200), which was not demonstrated in the case of the school chosen for this research.

Use of the ICT in the Teaching Practice

The research group DIM-UAB, with the sponsorship of EPSON undertook the project “pilot center Epson" that consisted in giving didactic and economic support to 15 teaching centers of in the compulsory learning and high school stage, so that they finish completing their resources and can use the interactive whiteboard in each one of their classrooms in order to make the most of their didactic possibilities. During the year 2006 and 2007, this study focused on the identification of teachers’ good practices collected information for its later dissemination to other centers and thus obtain better learning experiences based on the use and application of the ICTs. The applied methodology consisted in asking, before starting the project, that 220 teachers, throughout the research, participate in the four training seminars with a tutor that instructs in the technological and didactic area and that fill in, at that time, the corresponding reports. Several questionnaires and various personal interviews were applied under constant supervision of the appointed tutors to collect the results of the educational work.

When the research finished, the teachers said that there are more advantages than disadvantages when using the ICTs in their classrooms. They also said that learning to use them is important in the current society, as well as the relative simplicity of the material preparation due to its digital nature. All this would imply that learning and using the new ICT tools, so important in the current society as well as the renovation of the teaching methodologies with the application of these models, increase the satisfaction, motivation and self-esteem of the teacher, as long as their use are considered priority in the classroom and not in a separate classroom commonly used classroom with other classrooms.

Teacher’s Opinion about the IWBs.

A thesis prepared in Costa Rica, qualitative and with a naturist and interpretative approach sought to determine the impact of the IWB on the classrooms of a primary school with emphasis on the benefits that could be presented in students and teachers through an inductive process based on a case study. The sample selected corresponds to the third grade by comparing the classes given with and without using the IWB in all the basic subjects of the curriculum. Personalized interviews were conducted to elaborate on the categories selected to be evaluated, within the section “opinions of the teacher”. Perception, willingness or attitude, both also compared with the directed observation were considered. When checking the results, “it was identified that the teacher’s feeling is positive in all directions, towards the tools, need for training in its proper use and confidence that it is a useful and beneficial tool” (Díaz, 2012, p. 82). This was concluded with reference to the criteria of evaluation chosen, framed in the “frequency of use, the personal sentiment over the tool and the willingness to use it” (Díaz, 2012, p. 68), finishing with the idea that the IWB represents an effective tool for the educational practice and that teachers of such sample demonstrated satisfaction when using it although they do not believe that they have time to take advantage of its functionalities. As Gónzalez (2018) states, “the objective of the interactive whiteboard in the educational field is to provide the teacher with access to several technical and pedagogical contents and thus to present the students the opportunity to interact with the world.” (p. 89)

It should be noted that “the subject delivered during the application is not considered a significant limiting since the research was not related to the content of lessons, but it was focused

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on describing the attitudes and performances of the subjects involved" (Díaz, 2014, p. 85); and regarding the instrument used for data collection, interviews of teachers, students and groups of students, and the observations, there was no obstacle that should be overcome in terms of its application. Therefore, it was recommended "to study the attitude and willingness of the teachers towards IWB and the need to be trained in the use of it, to obtain the benefits of the use of this tool" (Díaz, 2014, p. 87).

Motivated Teachers, Motivated Students

A research conducted in 20 schools in Spain during the 2008-2010 period tried to describe the uses of the more used IWBs, as well as its advantages, disadvantages, among others. A similar methodology corresponding to the research-action was used. In addition, two "training action" that are explained below were planned:

> A training action (in each course) is a congress with pedagogical training sessions and sessions about basic techniques of IWB, forums of questions and answers, and specific orientations. The other training action (in each course) is a seminar in each one of the centers where teachers comment what they are doing, and the coordinator guides and provides new training (p. 103).

Forms of activities monitored, questionnaires and reports or follow-up records extracted from observation, participation and integration in the congresses offered were used. In percentage amounts, it was found that "practically all the teachers use IWB in more than 60% of their classes and half of them use it in more than 80% of their teaching activity" (Domingo, 2011, p. 108). Effectively, the most important aspect for this article was that fact that "the teachers highlight the methodological renovation and the increase of satisfaction, motivation and self-esteem" (Domingo, 2011, p. 113) in them and in their students after implementing IWB correctly. This is supported by the fact that "obviously the emergence of the digital networks of all type, socialization that Internet promotes, facilitates the strengthening of the social group component, providing a space of effective and positive convergence between the pedagogical practice and the technological advances" (Martín, 2009, p. 81).

Predisposition of the Teacher and the Level of Achievement

The work of Peña (2014) was conducted "based on the data obtained in the application of the training course for the use of the Interactive Whiteboard at the San Sebastián de Quilicura school accredited by SENCE code No. 1237910395 to 59 teachers divided into two groups" (p. 26). This thesis was prepared to determine that the more positive the teachers' predisposition, their didactic performance improves, since "the involvement of the teacher who accompanies, filters, organizes and guides learning and masters social knowledge; an enough technological infrastructure adapted to each particular situation" (Martín, 2009, p. 58) is fundamental for the pedagogical performance.

The author considered three variables for their analysis. The two first variables are the same as those emphasized throughout this present document. He also considered the level of achievement that teachers show at the end of a technological training course about the IWB as the third variable, which was measured through two evaluations applied at the beginning and at the end of it. The results obtained in this research showed that slightly more than half of the teachers evaluated presented a positive predisposition to the use of the IWBs. It was also found that most of the teachers that belonged to the sample reached an advanced level of achievement in the use of this tool. After processing the statistical data collected from the experimentation proposed, it was determined that the correlation between the last criteria mentioned is very low according to the Pearson's standard. After this finding, an analysis or variance (Anova) was conducted. However, no significance was obtained, since such work does not imply an important statistical agreement in terms of calculations made, due to the low empirical confidence that the instruments

used for data collection offer in the sample selected. This motivated the author to encourage the recipients of his research to continue working on the matter, prepare valid instruments, select broader samples and develop similar studies in other relevant areas of society.

Conclusions

Throughout the years, thanks to several research works, enthusiastic projects focused on the research on the advantages and disadvantages that IWB may have in the classroom, either to teach a specific topic of a course in particular or for all of them, have been developed. It has been tried to demonstrate that such instrument increases the attention and concentration of the students, as well as their participation and academic improvement. However, there are few research works focused on the teacher, in his role and especially in his motivation. For that reason, when starting with this review, it was believed to find numerous works about the topic, but it was not like that, and to make the scenario gloomier, there were fewer works conducted nationwide.

The foregoing leads to more questions than answers. If in the international field, although it has usually demonstrated the effectiveness of the IWB in the teaching-learning process, why people do not work to find out if in Peru can occur the same?, Will it possible to implement this technology in the public management classrooms? Peruvian teachers are sufficiently qualified to assume an active role in the management of knowledge under the characteristics of the modern society? If not, what is needed to achieve it?

So many questions to answer should generate more enthusiasm and curiosity in the teachers of the country. However, it may be the reason why the initiative to do research on a new and relatively complicated tool for many teachers was not conducted. Some of the teacher in our country may not feel motivated to improve their practice or innovate their lessons. It is probable that there is certain fear of change, since the traditional pedagogy has saturated the classrooms for years that it could be assumed that many of them have already become accustomed to it, and maybe they are not willing to question their results.

Since the IWB contributes not only as a basic tool, but as a set of experiences and knowledge that serves to successfully achieve an objective, there is a significant improvement in the agents involved in their self-esteem since they are able to increase their technological skills. (Murado, 2012). It is precise to be clear that such instrument "allows the application of new technology in the classroom, which make learning more interesting, motivated and interactive" (Montoya, 2014, p. 15). Although the enthusiasm or motivation teacher has to start to employ the IWB does not determine the final success or failure of its incorporation, it constitutes "a tool accepted by all teachers for three reasons: it is easy to use, it improves learning rapidly, and it enhances creativity" (Sáez-López, 2011, p. 306). It emphasizes the possibility that the long time that takes the didactic process "reduces with training and recoups the number of sessions" (Llorente, 2012: 93). However it is important as far as possible to avoid that the teacher, like the student "becomes a slave of the technology without knowing for sure what he learns, why he learns and what he really wants and needs to learn" (Pando, 2018, p. 481).

In short, although the importance of this work lies in the awareness of teachers in educational institutions of all level about training in the good use of technology, specifically of interactive whiteboards, especially the relevant influence of their predisposition to the development of competencies related to the ICTs, it should be taken into account that the current context is not ironically motivating, since "teachers consider that the problem of their own practices as a specific different and external to learning that eventually could be added to what they do" since, in certain scenarios, "self-inspection of what is done is not perceived as a need, less as an essential component in teaching" (Rodríguez-Sosa, 2018, p. 516). Given the exposed environment, the encouragement to continue doing research on the effective use of the IWB, ICTs, general resources is extended. But even more, it is exhorted to research on the role of the teacher, not only as a guide or moderator, but as an agent as active as the students who learns and teaches with his support, who admires and is admired for his work, who recognizes and is recognized for his effort,

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since only like that he could show his pride as an educator, developing his abilities to the fullest, so that students and teachers improve every day for the benefit of our country.

References

Bobbio, N. (1994). *Estado, gobierno y sociedad. Por una teoría general de la política.* México: Fondo de la Cultura Económica.

Corrales, M. (2015). *Selección, elaboración, adaptación y utilización de materiales, medios y recursos didácticos en formación profesional para el empleo.* España: Ediciones Paraninfo.

Daccach, J. (s.f.). Tecnologías de la Información y la Comunicación (TIC). Recuperado de: http://www.gestipolis.com/delta/term/TER434.html

Díaz, F. (2009). Las TIC en el aula: TIC y competencias docentes en el siglo XXI. En Carneiro, R., Toscano, J. y Díaz, T. *Los desafíos de las TIC para el cambio educativo* (139-154). Madrid: Editorial Santillana-OEI.

Díaz, I. (2012), El uso de las pizarras interactivas en la educación básica primaria: un estudio en una escuela privada en Costa Rica (Tesis de maestría). Universidad Virtual: Escuela de Graduados en Educación, Costa Rica. Recuperado de: https://repositorio.itesm.mx/handle/11285/619728

Domingo, M. (2011). Pizarra digital interactiva en el aula: uso y valoraciones sobre el aprendizaje. *Estudios sobre educación, 20,* 99-116. Recuperado de: https://www.unav.edu/publicaciones/revistas/index.php/estudios-sobre-educacion/article/view/4475

Duan, Y. (2010). Teaching interactively with Interactive Whiteboard: Teachers are the key. *Networking and Digital Society (ICNDS), 2nd International Conference, 1*, 144 –147. Doi: http://dx.doi.org/10.1109/ICNDS.2010.5479608

Cacheiro, M., Dulac, J. & Gallego, D. (2009). La pizarra digital interactiva como recurso docente. *evista Electrónica Teoría de la Educación. Educación y Cultura en la Sociedad de la Información, 10*(2), 153-178. Recuperado de: http://e-spacio.uned.es/fez/view/bibliuned:425-Mlcacheiro-5001

Gatica, N., & Valdivia, J. (2014). La pizarra digital interactiva y la web 2.0: Ambientes digitales que se sustentan en la teoría del constructivismo social. En *Capacitación y gestión del conocimiento a través de la web 2.0* (197-213). Madrid: DYKINSON S, L.

Llorente, J. (2012). Estudio, evaluación y optimización de los procesos de introducción de las TIC en los centros educativos en formación obligatoria (Tesis doctoral). Universidad Autónoma de Madrid, España. Recuperado de: https://repositorio.uam.es/bitstream/handle/10486/9878/50727_Llorente_Olier_Jose_Javier.pdf?sequence=1

Luna, E. (2006). *El docente presencial: Técnicas de enseñanza para enriquecer su desempeño académico*. México: Plaza y Valdés S.A.

Martín, O. (2009). Educación 2.0: Horizontes de la innovación educativa. En Nadal, J. (Ed.), TELOS 78: *La escuela digital. Desafíos de la innovación educativa* (53-61). Editorial Fundación Telefónica.

Monreal, I. (2013). Uso e integración curricular de la pizarra digital interactiva en el aula de música de primaria. Un estudio de casos en la provincia de Segovia (Tesis doctoral). Universidad de Valladolid, España. Recuperado de: http://uvadoc.uva.es/handle/10324/4228

Montoya, C. (2014). *El uso de la pizarra digital en el aula: Experiencia basada en el uso de la PDI de bajo costo*. Lima, Perú: Editorial VIRTUAL EDUCA.

Murado, J. (2012). *Pizarra digital: Herramienta metodológica integral en el contexto del aula del siglo XXI.* España: Ideas Propias.

Niemiec, C., & Ryan, R. (2009). Autonomy, competence, and relatedness in the classroom applying self-determination theory to educational practice. *Theory and Research in Education, 7*(2), 133-144. Doi: https://doi.org/10.1177/1477878509104318

Pando, V. (2018). Tendencias didácticas de la educación virtual: Un enfoque interpretativo. *Propósitos y representaciones*, *6*(1), 463-505. Doi: http://dx.doi.org/10.20511/pyr2018.v6n1.167

Prensky, M. (2001). *Nativos e inmigrantes digitales*. Adaptación al castellano por Institución Educativa SEK, España: Distribuidora SEK, S.A. Recuperado de: https://www.marcprensky.com/writing/Prensky-NATIVOS%20E%20INMIGRANTES%20DIGITALES%20(SEK).pdf

Reeve, J. (2012). A self-determination theory perspective on student engagement. En *Handbook of research on student engagement*, Nueva York: Editorial Springer.

Rodríguez-Sosa, J., Hernández-Sánchez, K. (2018). Problematización de las prácticas docentes y contextualización de la enseñanza. *Propósitos y representaciones*, *6*(1), 507-541. Doi: http://dx.doi.org/10.20511/pyr2018.v6n1.211

Ryan, R., & Deci, E. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemporary Educational Psychology*, *25*(1), 54-67. Doi: https://doi.org/10.1006/ceps.1999.1020

Sáez-López, J. (2011). *Valoración por parte de los docentes del uso y aplicación de la pizarra digital en educación primaria*. II Congreso Pizarra Digital. Recuperado de: https://s3.amazonaws.com/academia.edu.documents/45013518/3_II_congreso_PDI.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1550183053&Signature=%2Fw9VyO1qj5IGHW%2BHByd%2FyWf9qJ8%3D&response-content-disposition=inline%3B%20filename%3DVALORACION_POR_PARTE_DE_LOS_DOCENTES_DE.pdf

Sánchez, E. (2008). Las tecnologías de información y comunicación (TIC) desde una perspectiva social. *Revista Educare*, *12*, 155-162. Recuperado de: http://www.revistas.una.ac.cr/index.php/EDUCARE/article/view/1465