

Construcción de un instrumento para el aprendizaje en red de estudiantes universitarios

***Building an instrument for learning through "the network" of university
students***

***Construção de um instrumento para aprendizagem on-line de estudantes
universitários***

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Resumen

La falta de instrumentos para identificar aprendizajes en la Red y desarrollar habilidades de búsqueda de información al interactuar en ese medio justifica esta investigación, pues se procura orientar las prácticas de enseñanza de los docentes. En tal sentido, en este trabajo se presentan los datos de una prueba piloto que se realizó para identificar cómo los estudiantes de la Facultad de Informática de la Universidad Autónoma de Sinaloa se apropian de los aprendizajes cuando interactúan en Internet y cuáles habilidades desarrollan cuando buscan información en ese medio digital. Los resultados demuestran que aproximadamente 50 % de los jóvenes conectados a la Red autorregula su aprendizaje, más de 90 % se siente motivado cuando busca información en la Web y más de la mitad comprende cómo las TIC fomentan el aprendizaje. Sin embargo, en relación con los principios del conectivismo propuestos por Siemens (2004), los porcentajes se presentan de forma degradada. Esto significa que el rol del docente debe cambiar para establecer interacciones que fomenten nodos y redes de aprendizaje. Por tanto, se puede concluir que el instrumento usado en esta investigación se puede aplicar en otras facultades para proponer diseños de aprendizaje en red que faciliten la educación, la formación, y fortalezcan el desarrollo de aprendizajes continuos.

Palabras clave: aprendizaje autorregulado, aprendizaje en red, estudiantes universitarios, habilidades en red, instrumento, interacciones en red.

Abstract

The lack of instruments to identify network learning and development of information search skills when interacting "in a network" make this research necessary, in order to direct the teaching methods by teachers. The following question is asked: How to build an instrument of identification of appropriation of learning and development of information search skills when interacting "in network" young people of the Autonomous University of Sinaloa? The implementation of the pilot test of the development of the methodological strategy used for the quantitative-descriptive phase of a project of the called: "Teachers and students in the teaching-learning process in network at the Autonomous University of Sinaloa" is presented. The population was conformed by students of the Faculty of Informatics. As a result of the pilot test it was that they are university students, approximately 50% of young people connected to "the network" self-regulate their learning, motivation is visible in students in more than 90%, little more than half achieves a worldview of how ICTs promote learning. In relation to the principles of connectivism proposed by Siemens (2004), the percentages are presented in a degraded manner. The teaching figure must change in the learning "in network" and establish interactions that promote nodes and learning networks. It was concluded that it is an instrument ready to be applied in other faculties and to propose learning designs "in network" that facilitate education, training and strengthen the development of continuous learning

Keywords: Self-regulated learning, Network learning, College students, Network skills, Instrument, Network interactions.

Resumo

A falta de instrumentos para identificar a aprendizagem na Internet e desenvolver habilidades de busca de informação ao interagir nesse ambiente justifica esta pesquisa, uma vez que busca orientar as práticas docentes dos professores. A este respeito, estes dados papel de um teste piloto foi realizado para identificar como os estudantes da Faculdade de Ciência da Computação na Universidade Autónoma de Sinaloa sequestrar aprendizagem quando interagem on-line e que habilidades desenvolver quando procuram informação apresentada nesse meio digital. Os resultados mostram que aproximadamente 50% dos jovens conectados à aprendizagem auto-regulada de rede, mais de 90% se sentem motivados quando procuram informações na Web e mais da metade entender como as TIC promover a aprendizagem. No entanto, em relação aos princípios de conectividade propostos por Siemens (2004), os percentuais são apresentados de forma degradada. Isso significa que o papel do professor deve mudar para estabelecer interações que promovam nós e redes de aprendizagem. Portanto, pode-se concluir que o instrumento utilizado nesta pesquisa pode ser aplicado em outras faculdades para propor projetos de aprendizagem online que facilitem a educação, o treinamento e o fortalecimento do desenvolvimento da aprendizagem contínua.

Palavras-chave: aprendizagem auto-regulada, aprendizagem em rede, estudantes universitários, habilidades de rede, instrumento, interações de rede.

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Introduction

Many authors (Davidson y Golberg, 2009; De Benito, Pérez y Salinas, 2008; Guitert, 2014; Harasim, Hiltz, Turoff y Teles, 2000; Suárez y Gros, 2012) coincide in pointing out that when students interact in a network (also called online learning) they form connections that allow them to "learn together in the place, at the time and at the pace that is most appropriate and appropriate" (Harasim et al., 2000, p.24). This offers greater flexibility to the teaching-learning process and serves to support virtual environments that facilitate the development of a set of didactic methodologies focused on the student (De Benito et al., 2008).

However, although this type of activity "raises the interest of different actors in the educational field, there are still many questions about how networked learning should be designed to adequately facilitate education and training" (Sloep and Berlanga, 2011). In fact, there is still a lack of instruments to determine how students' skills are consolidated to search for information when interacting in a network.

For this, it must be taken into account that today's university students are characterized by integrating information and communication technologies (ICT) into their daily lives. In this sense, several authors have used different terms to refer to them, such as digital natives (Prensky, 2001), generation net (Tapscott, 1998), digital generation (Palfrey, Gasser, Simun and Barnes, 2009), generation @, generation Google, among others. In this regard, the United Nations Children's Fund (Unicef, for its acronym in English) (2011) notes the following:

[These people] share a common global culture defined less by age than by their experience of growing immersed in a digital technology. This experience affects their interaction with information technologies and with the information itself, as well as with the way they interact with each other and with other people and institutions. (p. 11).

For this reason, it is not strange that these students express themselves in this way before the educational activities: "Everything the teachers have exposed is found on the Internet (...). It is a waste of time and a boring class "(Morfin, February 11, 2015, paragraph 1), hence they prefer to invest their time in finding information and interacting with other

people through the Web, because this digital medium it allows them to enhance their cognitive skills and self-manage their knowledge.

This means not only that the figure of the teacher transmitting information enters into crisis (Coll and Monereo, 2008), but also that the dominant educational process breaks up into a virtual world where knowledge has become a key element for the process productive and for the good economic performance of the countries (World Economic Forum [WEF], 2012).

As pointed out by Castells (2005), the functions and dominant processes in the information age are increasingly organized around networks, since these form the new morphology of current societies. In this sense, the objective of this work is to create an instrument to identify how the students of the Informatics Department of the Southern Regional Unit of the Autonomous University of Sinaloa (UAS) appropriate learning when they interact on the Internet and what skills they develop when they look for information in that digital medium.

Conceptual framework

The following are the study categories that underlie this research, that is, university students (young people in network), learning appropriation (self-regulated learning and motivation) and development of network information search skills (connectivism and interactions).

Young people in network

The United Nations (UN) defines young people as those who are between 15 and 24 years old, while the United Nations Educational, Scientific and Cultural Organization (Unesco, for its acronym in Spanish) English) (sf) describes them as a heterogeneous group in constant evolution whose experience varies according to the regions of the planet where they live. Crovi and Lemus (2014) consider them as follows:

Groups of young people changing, contradictory, diverse, complex, that have certain characteristics according to the social and cultural context in which they operate (...), which currently refer to a series of meanings, cultures and visions of the world, closely linked with the development and impact of digital technologies. Such link is expressed in the daily activities and lifestyles of young people, which varies depending on time, space and also the predominant social activity (p. 36).

From the previous explanation it can be inferred that the term young can not be subject to unique concepts, since there are different cultural, contextual, etc. variables, which must be taken into account before issuing a definition (Bourdieu, 2000). Of these variables, however, one of the most related to young people today is the digital world, since more than 80% of them worldwide have access to the Internet (International Telecommunication Union [ITU], 31 July 2017). In Mexico, for example, according to the National Institute of Statistics and Geography (Inegi) (2016), 83.1% of people between 18 and 24 years of age carried out some activity on the Web, while 94.1% of students of higher education They were Internet users. This means that students, having contact with the Network from an early age, enter "the university knowing how to use different technological devices, with different logics of thinking, with different ways of learning and doing their school work, with new ways of learning. social organization, with other ways of capturing reality "(Domínguez and López, 2015, p.49).

Self-regulated learning

From a constructivist perspective, self-regulated learning occurs when the student wants to find an answer to the questions asked (Panadero and Alonso, 2014) and when he is able to plan and control his own learning (Marini and Boruchovitch, 2014, p.1). This happens when three main phases are met: 1) planning, which covers the prior knowledge and initial beliefs that influence the learning of the subject, as well as the moment in which the student sets the goals and outlines the strategic plan for achieve them; 2) monitoring, which is related to what occurs during learning to stimulate achievement, with emphasis on attention and self-

monitoring, and 3) self-evaluation of actions that occur at the end of the task (Marini and Boruchovitch, 2014).

Self-regulated learning, therefore, is an active and constructive process that involves active self-control and cognition to perform certain assignments (Pintrich and Zusho, 2002). These allow you to increase, on your own and even outside formal settings, the level of knowledge and skill in a given area (Bjork, Dunlosk y Kornell, 2013).

Self-regulation activities, of course, depend on contextual factors (Pintrich and Zusho, 2002) and individual factors, among which motivation stands out (Santrock, 2002, Schunk and Pajares, 2002), which is why Zimmerman (2008) considers it as an essential variable to develop self-regulated learning. According to Smith (2001), this is the energy that gives direction to behavior, which is central to the self-management of learning, since it is channeled towards a particular purpose (Clark, 2012).

Motivation, however, also requires volition, because although the first drives commitment, the second controls the persistence of learning self-management (Corno, 1986). Therefore, it is necessary to develop intrinsic and extrinsic motivation as "inherent tendency to seek novelty and challenge, to extend and exercise one's abilities, to explore and to learn" (Ryan and Deci, 2000, p.70). In the words of Brophy (2010), it can be said that motivation is a theoretical construction that arises from the interaction between many factors, such as success, values, gratification, interests and self-esteem.

Conectivismo

At present, knowledge not only grows exponentially, but is also unfinished. In this context comes the connectivism, a theory of learning proposed by Siemens and Downes (Siemens, 2004, 2010) to try to explain how young people interact on the Internet, and is shaped by principles of theories of chaos, networks, complexity and self-organization. As a theory, it presents a learning model where this process is not only individual, but also collective, through the creation of networks, so that it is "like a network that connects specialized information packages and determines existing relationships that allow us to expand our knowledge "(Islas and Delgadillo, 2016, p.125). In connectivism, therefore, the interactions

that individuals perform in the pursuit of an objective serve to develop nodes and a learning network. Siemens (2004) considers that connectivism is shaped by the following principles:

1. Go from confusing to defined.
2. Decide where to look.
3. Immerse yourself in the information and decide what is useful.
4. Relate information to create knowledge.
5. Share with others.
6. Give meaning from identifiable patterns.
7. Expose and provide feedback.
8. Learn from the environment and the environment.
9. Generate learning networks.

According to these principles, students move from confusing to defined, because they use the information collected and reconstructed through interactions made in the network that is created. In the words of Islas and Delgadillo (2016), it is no longer learned only with formal education, but also through different ways, communities of practices and networks of people, so "learning becomes a continuous process as long life "(Islas and Delgadillo, 2016, p 119). Now, in this work the term interaction is taken as the link established by students through the network created between them, which occurs in virtual educational scenarios, either by activities in general or by the particular actions they develop the participants (teachers and students) to fulfill the different tasks of the teaching and learning process (Holmberg, 1985; Jonassen, Carr and Yueh, 1995). In this network learning the interactions are established by the objective and motivation, which impel participants to seek information, because "interactivity is not a feature of the medium, but a construction related to the process of communication" (Milojević , Kleut and Ninković, 2013, p.94).

In this interaction there is an individual-computer relationship, as well as a mediated link between individuals. In this way, two types of interactivity are developed: the selective and the communicative. In the first, students seek information in different domains of the Internet, browse different web pages (static or dynamic) and read, listen or see information that they then assimilate to turn it into knowledge. In contrast, in the communication, students who

interact in a network (synchronously or asynchronously) share information, ideas or solutions to problems.

In these two types of interactivity there is a process of assimilation and appropriation of knowledge, which causes the transformation of the internal cognitive structures of the subject, at the same time that it modifies its behavior based on the interpretation of reality. According to Covi (2016), "the processes of appropriation of technological resources determine, to a large extent, the type of interaction that the subjects establish" (p.33). This serves to generate two arguments: knowledge is constructed in interaction and knowledge is not a product of the mind by itself.

Based on what was stated in the previous pages, it can be affirmed that university students are young people who interact and develop information search skills online. This part of the self-regulation of learning through planning, control and regulation, which modifies their cognitive structures and makes them aware of the (de) construction of their knowledge.

Methodology

Next, the methodological strategy used for the quantitative phase of a larger project called Teachers and students in the network teaching-learning process at the Autonomous University of Sinaloa is explained. This strategy has a descriptive emphasis, with a positivist stance. The purpose is to share the pilot test of an instrument (see annex) created to identify how the students of the Informatics Department of the Southern Regional Unit of the Autonomous University of Sinaloa (UAS) appropriate learning when they interact on the Internet and which skills develop when they seek information in that digital medium.

The construction of the instrument

From the aforementioned theoretical-methodological perspective, the type of instrument that was needed to consistently and punctually include the actions, activities and skills of the study subjects when they performed their tasks in the network was first identified. The central categories of the research were the following: university students (young people between 18 and 24 years of age who use ICT as a means and support of the learning process), appropriation of learning (process through which they self-regulate their learning, they are

motivated to learn, identify the way they learn and build their own learning) and development of network information search skills (ability to develop when searching, identifying, locating, selecting, evaluating and using information on the network to form nodes and networks Learning).

Subsequently, the categories were operationalized in a smaller number of indicators; then, the instrument was structured with closed questions (Likert scale) and with an open question formulated from the conceptual framework that was created by consulting different databases (EBSCO, ERIC, ProQuest, Redalyc, SAGE), books, chapters of books and thesis.

For the construction of the instrument, the articles by Covi and Lemus (2014) (how young people surf the Internet), Durán, Varela, Fortoul (2015) (self-directed self-assessment scale) and Pintrich, Smith, García and McKeachie (1991) (motivation scale).

Likewise, the instrument was interviewed and socialized with two teachers and two students from the population to be studied, which was structured as follows: 1) identification, 2) appropriation of learning and 3) development of information search skills in the network (See Annex).

In the identification, the university students were considered according to gender, age, career, semester and if they were currently working. In the appropriation of learning, self-regulated learning and motivation (interest in the educational process and its challenges) were taken into account. In the development of network information search abilities, connectivism (establishment of nodes and formation of learning networks) and interactions (selective or communicative, as well as the interactions formed in the network student-learning relationship) were estimated.

Then proceeded to make the content validity, which was configured from the criterion of judges through the V of Aiken. According to Ecurra (1988), eight judges are required, at least, to perform the validation work, of which seven must agree so that each item is valid and reach a coefficient V equal to or greater than 0.25 at a level of significance statistic of $p < 0.05$, according to the formula:

$$V = \frac{S}{(N(C - 1))}$$

Where

S = Sumatoria de S_i

S_i = Valor asignado por el juez

N = Número de jueces

C = Número de valores de la escala

The judges of this instrument were seven teachers with a postgraduate degree in Education and one with a postgraduate degree in Computer Science. The instrument met the criteria established in accordance with the V of Aiken for validation at 0.90 points.

The delimitation of the universe and the sample

The UAS is a public educational institution that seeks to train competent students to be inserted in the workplace that society demands. The Faculty of Computing of the South Regional Unit - composed of 425 students - offers two educational programs: the degree in Computer Science and the Engineering in Information Systems (four years each career, in two shifts: morning and evening). To apply the pilot test, a sample with a margin of error of 10% and a confidence level of 95% was calculated, which resulted in 79 students. However, 80 students were taken as reference and all the years and shifts were covered.

The reliability of the instrument was obtained with Cronbach's alpha coefficient, through the use of the SPSS program. To do this, we sought to measure the same construct and a high correlation (Welch and Comer, 1988). When applied to the sample, it was obtained as Cronbach's alpha coefficient 0.860. George and Mallery (2003) suggest evaluating these results in light of the following values:

- Coeficiente alfa $> .9$ es excelente
- Coeficiente alfa $> .8$ es bueno
- Coeficiente alfa $> .7$ es aceptable
- Coeficiente alfa $> .6$ es cuestionable
- Coeficiente alfa $> .5$ es pobre

This means that the result of the coefficient of Cronbach's alpha is good.

Results and Discussion

The analysis of presented data corresponds to the pilot test of the constructed instrument. This was applied to students of the Faculty of Informatics with the purpose of modifying, adjusting and improving the categories of analysis, as well as verifying if the instructions and the items were comprehensible for the subjects of study.

For the interpretation, the data were grouped into the established categories: university students (young people in network), learning appropriation (self-regulated learning and motivation) and development of network information search skills (connectivism and interactions).

As for the university students, 75% were male and 25% were female. The age ranged between 18 and 28 years, of which 95% (between 18 and 22 years) were in the youth range established by the UN. Likewise, 42.5% worked, while 57.5% did not combine their studies with professional work. These university students were Internet users, used various technological resources and had different ways of learning and doing their school work.

In relation to the appropriation of learning -specifically related to the self-regulated learning component-, when looking for some information about their classes or tasks on the Internet, 60% of the students considered that Always or Almost always managed their time and did their school work before the deadline, although only 40% (in those same options) investigated in advance the topics of the class. In addition, 52.5% of the respondents reviewed the information on the subject at the end of the class, hence approximately 50% of the informants self-regulate their learning. This means that it is necessary, on the one hand, for students to self-monitor and channel their school goals and, on the other, for teachers to serve as guides in that work.

In the motivation component, only 32.5% of the students considered that Almost always and Sometimes it was a challenge to look for information, which means that for them this task is simple. In fact, 95% always and almost always excited to search the Internet for information about what they learned in class. In addition, 92.5% (in those same options) struggled academically, even if they did not like the subject. Moreover: 87.5% said that Always and Almost always was interested in subjects of the subjects and reinforced them with Internet searches. These high percentages of interest and commitment can be interpreted

as a stimulus for students to have more effective learning and higher levels of motivation (Wang, Shannon and Ross, 2013).

On the other hand, 65% of participants felt that Always and Almost always identified the strategies they needed to search the Internet for information on their assignments. In fact, 70% of the students (in the same options) identified what they were going to look for before starting that task, while 52.5% analyzed how they had done their work and homework. In other words, more than half used ICT to self-regulate their learning.

However, in the category of developing information search skills in the network, specifically in the connectivism component, 92% of respondents always and almost always entered a search engine, wrote the word or phrase they needed to consult, reviewed the results, entered to a page and read the information; while 72% - in addition to the above - looked at other pages, 72.5% shared the information with their peers, 65% took notes of ideas, thoughts and new learning they were acquiring, and 47.5% interacted in blogs with other people from the country or from abroad. These results show that the principles of connectivism, as proposed by Siemens (2004), are not used to the maximum, since there is weakness in the formation of nodes and learning networks.

Finally, in the interaction component, the students expressed that when browsing the Internet and looking for information about classes or tasks, they identified themselves with the terms selective (77.5%) and communicative (22.5%). This indicates that most students seek information on the Internet and then assimilate it and turn it into knowledge without communication or networking through the Internet. In addition, when interacting on the Web, 95% considered that Always and Almost always communicated with their peers. In fact, this same percentage (in the same options) interacted through the Network to solve problems or doubts related to their school tasks. In fact, when having difficulties to understand information related to their academic work, 70% of students said that Always and Almost always interacted with someone to seek help, 90% collaborated without problems with other people, 67.5% communicated with people from different ages, cultures, religions and countries, and 82.5% said that interaction with other people on the Internet fostered their learning and served to find support.

However, 67.5% confessed that Never and Almost never consulted their teacher on the Web to solve problems or related to their assignments. This invites us to reflect on the role of the teacher as a mediator of online learning, since "interactivity is not a characteristic of the medium, but a construction related to the process of communication" (Milojević *et al.*, 2013, p. 94).

Conclusions

After observing the results of this test it can be concluded that the instrument used is valid in its content and reliability, so that it can be applied in the Informatics Faculties of the Central and North Regional Unit. The purpose is to be able to use it later in different faculties and schools of this house of studies to know the ways in which their students self-regulate their learning and their academic motivation in network, as well as the development of their information search skills (identification, location, selection, evaluation and use) and the formation of nodes and learning networks through interactions. With this, strategies and teaching-learning processes supported by the Web can be proposed, which will favor the development of continuous learning.

References

- Bjork, R., Dunlosk, J. and Kornell, N. (2013). Self-Regulated Learning: Beliefs, Techniques, and Illusions. *Annual Review of Psychology*, 64(1), 417-444. Retrieved from <https://www.annualreviews.org/doi/abs/10.1146/annurev-psych-113011-143823>.
- Bourdieu, P. (2000). *La "juventud" no es más que una palabra*. México: Grijalbo.
- Brophy, J. E. (2010). *Motivating students to learn*. New York, NY: Routledge.
- Castells, M. (2005). *La era de la información* (vol. 1). Madrid: Alianza.
- Clark, I. (2012). Formative Assessment: Assessment Is for Self-regulated Learning. *Educational Psychology Review*, 24(2), 205-249. Retrieved from <https://link.springer.com/article/10.1007/s10648-011-9191-6>.
- Coll, C. y Monereo, C. (2008). Educación y aprendizaje en el siglo XXI: Nuevas herramientas, nuevos escenarios, nuevas finalidades. En Coll, C. y Monereo, C. (eds.), *Psicología de la educación virtual*. Madrid, España: Morata.
- Corno, L., (1986). The metacognitive control components of self-regulated learning. *Contemporary Educational Psychology*, 11(4), 333-346. Retrieved from <https://www.sciencedirect.com/science/article/pii/0361476X86900299?via%3Dihp>.
- Crovi, D. (2016). Juventudes y cultura digital. Las redes sociales como espacio de interacción. En Crovi, D. (ed.), *Redes sociales digitales: lugar de encuentro, expresión y organización para los jóvenes* (pp. 13-40). México: La Biblioteca.
- Crovi, D. y Lemus, M. C. (2014). Jóvenes estudiantes y cultura digital: una investigación en proceso. Bitácora de la propuesta metodológica cuantitativa. *VIRTUalis*, 5(9), 36-55. Recuperado de <http://aplicaciones.ccm.itesm.mx/virtualis/index.php/virtualis/article/view/92>.

- Davidson, C. and Goldberg, D. (2009). *The future of learning institutions in a digital age*. England: The MIT press. Retrieved from https://dmlcentral.net/wp-content/uploads/files/Future_of_Learning.pdf.
- De Benito, B., Pérez, A. y Salinas, J. (2008). *Metodologías centradas en el alumno para el aprendizaje en red*. Madrid: Editorial Síntesis.
- Domínguez, F. y López, R. (2015). Uso de las redes sociales digitales entre los jóvenes universitarios en México. Hacia la construcción de un estado del conocimiento (2004-2014). *Revista de Comunicación*, 14. Recuperado de <http://revistadecomunicacion.com/pdf/2015/Art048-069.pdf>.
- Durán, C., Varela, M. y Fortoul, G. (2015). Autorregulación en estudiantes de medicina: traducción, adaptación y aplicación de un instrumento para medirla. *Investigación en Educación Médica*, 4(13), 3-9.
- Escurra, L. (1988). Cuantificación de la validez de contenido por el criterio de jueces. *Revista de Psicología*, 6(1-2). Recuperado de <http://revistas.pucp.edu.pe/index.php/psicologia/article/view/4555>.
- Fondo de las Naciones Unidas para la Infancia [Unicef]. (2011). *El estado mundial de la infancia 2011. La adolescencia una época de oportunidades*. Recuperado de http://www.unicef.org/spanish/sowc2011/pdfs/SOWC-2011-Main-Report_SP_02092011.pdf.
- Foro Económico Mundial [FEM]. (2012). *The Global Competitiveness Report 2012-2013*. Ginebra. Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf.
- George, D. and Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update*. Boston, USA: Allyn & Bacon.

- Guitert, M. (coord.). (2014). *El docente en línea. Aprender colaborando en la red*. Barcelona: Editorial UOC.
- Harasim, L., Hiltz, S., Turoff, M. y Teles, M. (2000). *Redes de aprendizaje. Guía para la enseñanza y el aprendizaje en red*. Barcelona: Gedisa.
- Holmberg, B. (1985). *Status and trends of distance education*. Suecia: Lector Publishing.
- Instituto Nacional de Estadística y Geografía [Inegi] (2016). *Estadísticas a propósito del día mundial de Internet (17 de mayo)*. Recuperado de http://www.inegi.org.mx/saladeprensa/aproposito/2016/internet2016_0.pdf.
- Islas, C. y Delgadillo, O. (2016). La inclusión de TIC por estudiantes universitarios: una mirada desde el conectivismo. *Apertura*, 8(2), 116-129. Recuperado de <http://www.udgvirtual.udg.mx/apertura/index.php/apertura/article/view/845>.
- Jonassen, D., Carr, C., and Yueh, H. (1995). Computers as mindtools for engaging learners in critical thinking. *TecTrends*, 2, 24-32.
- Marini, J. A. and Boruchovitch, E. (2014). Self-Regulated Learning in Students of Pedagogy. *Paidéia*, 24(59), 323-330. Retrieved from http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-863X2014000300323&lng=en&tlng=en.
- Milojević, A., Kleut, J. and Ninković, D. (2013). Methodological Approaches to Study of Interactivity in Communication Journals. *Comunicar*, 21(41), 93-102.
- Morfin, F. (11 febrero de 2015). Cambiar los escenarios de aprendizaje [mensaje en un blog]. Reflexiones sobre la red y el aprendizaje, aprender en red. Recuperado de <https://franciscomorfin.wordpress.com/2015/02/11/cambiar-los-escenarios-de-aprendizaje/>.

- Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura [Unesco]. (s. f.). La Unesco trabajando con y para los jóvenes. Recuperado de <http://www.unesco.org/new/es/populartopics/youth/>.
- Palfrey, J., Gasser, U., Simun, M. and Barnes, R.F. (2009). Youth, creativity and copyright in the digital age. *International Journal of Learning & Media*, 1(2), 79-97. doi:10.1162/ijlm.2009.0022.
- Panadero, E. y Alonso, J. (2014). Teorías de autorregulación educativa: una comparación y reflexión teórica. *Psicología Educativa*, 20 (1), 11-22. doi: 10.1016/j.pse.2014.05.002.
- Pintrich, P. and Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In Wigfield, A. and Eccle, J. S. (eds.), *Development of achievement motivation*, (pp. 249–284). San Diego, CA: Academic Press. doi:10.1016/B978-012750053-9/50012-7.
- Pintrich, P., Smith, D., García T. and McKeachie, W. (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ). National Center for Research to Improve Postsecondary Teaching and Learning. University of Michigan. Retrieved from <https://files.eric.ed.gov/fulltext/ED338122.pdf>.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5). 1-6. doi.org/10.1108/10748120110424816.
- Ryan, R. and Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78. dx.doi.org/10.1037/0003-066X.55.1.68.
- Santrock, J. (2002). *Psicología de la educación*. México: Mc Graw-Hill.
- Schunk, D. and Pajares, F. (2002). The development of academic self-efficacy. In Wigfield, A. and Eccle, J. S. (eds.), *Development of achievement motivation* (pp. 15–31). San

- Diego, CA: Academic Press. Retrieved from <https://www.uky.edu/~eushe2/Pajares/SchunkPajares2001.PDF>.
- Siemens, G. (2004). *Conectivismo: una teoría de aprendizaje para la era digital*. Recuperado de <http://clasicas.filos.unam.mx/files/2014/03/Conectivismo.pdf>.
- Siemens, G. (2010). *Conociendo el conocimiento*. Recuperado de <https://www.box.com/shared/31mg21z77d>.
- Sloep, P. and Berlanga, A. (2011). Learning Networks, Networked Learning. *Comunicar*, 37, 55-64. doi.org/10.3916/C37-2011-02-05.
- Smith, P. (2001). Understanding Self-Regulated Learning and Its Implications for Accounting Educators and Researchers. *Issues in Accounting Education*, 16(4), 663-700. doi: 10.2308/iace.2001.16.4.663.
- Suárez, C. y Gros, B. (2012). *Aprender en red. De la interacción a la colaboración*. Barcelona: Editorial UOC.
- Tapscott, D. (1998). *Creciendo en un entorno digital: la generación net*. Colombia: McGraw-Hill.
- Unión Internacional de Telecomunicaciones [UIT]. (31 de julio de 2017). ITU releases 2017 global information and communication technology facts and figures Statistics show youth continue to dominate Internet usage, while mobile broadband subscriptions set to hit 4.3 billion. Retrieved from <https://www.itu.int/en/mediacentre/Pages/2017-PR37.aspx>
- Wang, C., Shannon, D. and Ross, M. (2013). Students' characteristics, self-regulated learning, technology self-efficacy, and course outcomes in online learning. *Distance Education*, 34(3), 302-323. doi: 10.1080/01587919.2013.835779.
- Welch, S. y Comer, J. (1988). *Coeficiente de alpha de Cronbach*. Recuperado de <http://www.uv.es/~friasnav/AlfaCronbach.pdf>.

Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166-183. doi:10.3102/0002831207312909.

Anexo

El aprendizaje por medio de la Red en estudiantes de la Facultad de Informática de la Universidad Autónoma de Sinaloa

Instrumento

Este cuestionario está dirigido a estudiantes universitarios con la finalidad de identificar cómo se apropian de los aprendizajes cuando interactúan en Internet y cuáles habilidades desarrollan cuando buscan información en ese medio digital. Este cuestionario es anónimo y las respuestas son completamente confidenciales.

Agradecemos tu colaboración y te invitamos a responder de forma clara y honesta.

Marca o completa la información solicitada.

A. IDENTIFICACIÓN.

1. **Género:** a) Masculino b) Femenino
2. **Edad** _____ años
3. **Carrera** _____
4. **Semestre** _____
5. **Actualmente trabajas** a) Sí b) No

B. INTERACCIÓN

6. Pensando en tu interacción cuando navegas por Internet, y al estar buscando alguna información sobre tus clases o tareas, ¿con cuál descripción te identificas más?

Marca con una X el recuadro y elige solo una opción. Lee detenidamente las descripciones

Selectivo	Comunicativo
Buscas información en varias páginas de Internet, pero no interactúas en Internet con ninguna persona	Al buscar información en Internet tienes interacción con otras personas que te puedan ayudar y orientar en la búsqueda

C. APROPIACIÓN DE APRENDIZAJE Y DESARROLLO DE HABILIDADES DE BÚSQUEDA DE INFORMACIÓN

Contesta la siguiente pregunta

7. Cuando navegas en Internet para buscar alguna información requerida o extra para la clase, usualmente en cuál buscador realizas las búsquedas	
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Marca con una X el recuadro. Elige solo una opción. Lee detenidamente las descripciones

	Siempre	Casi siempre	A veces	Casi nunca	Nunca
8. Utilizas Internet para comunicarte con tus compañeros					
9. Utilizas Internet para realizar tareas o trabajos escolares					
10. Cuando vas a buscar alguna información sobre tus clases o tareas en Internet, administras tu tiempo, te gusta hacer las cosas antes de la fecha límite					
11. Cuando vas a buscar información en Internet sobre tus clases o tareas, identificas las estrategias que necesitas buscar y/o realizar					
12. En relación con la información que vas a buscar sobre tus clases o tareas, identificas qué vas a buscar antes de iniciar la búsqueda en Internet					
13. Al buscar información en Internet, analizas cómo has hecho tus trabajos y tareas escolares					
14. Cuando buscas información en Internet sobre tus trabajos escolares, interactúas con alguien para obtenerla					
15. Es un reto para ti buscar información en Internet para tus trabajos y/o tareas					
16. La información que te presentan tus profesores en el aula la puedes encontrar en Internet					
17. La información presentada por tu profesor ya la leíste o la puedes encontrar en Internet					
18. Investigas en Internet con anticipación los temas de la clase					
19. Al terminar un tema en clase, revisas información nueva sobre el mismo en Internet					
20. Mantienes la mente abierta a puntos de vista diferentes a los tuyos relacionados con los temas de las clases					
21. Agradeces cualquier crítica u opinión que contribuya a mejorar tu aprendizaje					
22. Pides ayuda cuando tienes dificultades para comprender la información encontrada en Internet					
23. Reconoces tus fortalezas y debilidades en las búsquedas de Internet					

Marca con una X el recuadro. Elige solo una opción. Lee detenidamente las descripciones

	Siempre	Casi siempre	A veces	Casi nunca	Nunca
24. Cuando navegas en Internet para buscar alguna información requerida o extra para la clase:					
a) Entrás a un buscador, <ul style="list-style-type: none"> • Escribes las palabras clave o las frases que necesitas buscar • Lees los resultados de la búsqueda • Entrás a la liga donde piensas que puedes encontrar la información • Lees la información 					
b) Aunque hayas encontrado la información adecuada, te regresas a la página de resultados y buscas en otras páginas de Internet para identificar cuál puede completar la información					
c) Aparte de complementar la información buscada, la compartes con los demás					
d) Además de compartir con los demás, interactúas en un blog con otras personas de tu país o de otras partes del mundo					
e) Haces notas de tus ideas, pensamientos y nuevos aprendizajes que adquiriste al hacer búsquedas en Internet					
25. Buscas tutoriales en Internet para saber cómo hacer tus tareas					
26. Cuando interactúas en Internet:					
a. Colaboras sin problema con otras personas					
b. Te relacionas con otras personas de diferentes edades, culturas, religiones y países					
c. Consideras que te ayuda a incrementar tu aprendizaje					
d. Encuentras efectivo el apoyo de las personas					
e. Te gusta compartir la información con otras personas					
f. Te comunicas con algún compañero para resolver problemas o dudas relacionadas con tus trabajos o tareas escolares					
g. Consultas a tu profesor por algún canal de comunicación en la Red para resolver tus problemas o dudas relacionadas con tus trabajos o tareas escolares					

D. MOTIVACIÓN

Marca con una X el recuadro. Elige solo una opción. Lee detenidamente las descripciones

	Siempre	Casi siempre	A veces	Casi nunca	Nunca
27. Te entusiasma buscar información en Internet sobre lo aprendido en clase					
28. Te esfuerzas académicamente incluso si no te gusta lo que haces					
29. Intentas pensar a través de un tema y decidir lo que se supone debes aprender					
30. Generalmente te interesan los temas de las asignaturas y las refuerzas con búsquedas en Internet					