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REVIEW ARTICLE

Innovative educational practices in higher education: a systematic review

Prácticas educativas innovadoras en la educación superior: una revisión sistemática

Práticas educativas inovadoras no ensino superior: uma revisão sistemática

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ABSTRACT. The aim was to identify by means of a systematic review different innovative educational practices in Higher Education. For this purpose, a search of scientific articles was carried out in different databases Scopus and Web of Science, where a total of 1470 documents were obtained and, after applying the inclusion criteria, 20 works were left for review. The results show that creative practices favor the construction of the teaching-learning process and the development of competencies. The teacher should take into account the contextualization of knowledge and start from the students' center of interest, in order to promote attitudes in new procedures based on innovation, enhancing skills that predispose the student towards motivation and involvement. In conclusion, it is suggested that new studies take into account the results found in the present work. This could promote the attainment of knowledge based on cooperation and motivation, divergent thinking and student inclusion.

RESUMEN. El objetivo fue identificar mediante una revisión sistemática diferentes prácticas educativas innovadoras en Educación Superior. Para ello, se realizó una búsqueda de artículos científicos en distintas bases de datos Scopus y Web of Science, donde se obtuvieron un total de 1470 documentos que, tras aplicar los criterios de inclusión, quedaron 20 trabajos para revisión. Los resultados muestran que las prácticas creativas favorecen la construcción del proceso de enseñanza-aprendizaje y el desarrollo de competencias. El docente debe tener en cuenta la contextualización del conocimiento y partir del centro de interés del alumnado, para potenciar

actitudes en nuevos procedimientos basados en la innovación, potenciando habilidades que predispongan al estudiante hacia la motivación e implicación. Como conclusión, se sugiere que nuevos estudios tengan en cuenta los resultados hallados en el presente trabajo. Ello podría fomentar la obtención de un conocimiento basado en la cooperación y motivación, el pensamiento divergente y la inclusión del alumnado.

PALAVRAS-CHAVE

criatividade; inovação; estudantes universitários; revisão sistemática.

RESUMO. O objetivo foi identificar por meio de uma revisão sistemática diferentes práticas educacionais inovadoras no Ensino Superior. Para isso, foi realizada uma busca de artigos científicos em diferentes bases de dados Scopus e Web of Science, onde foram obtidos um total de 1470 documentos, que, após a aplicação dos critérios de inclusão, deixaram 20 trabalhos para revisão. Os resultados mostram que as práticas criativas favorecem a construção do processo ensino-aprendizagem e o desenvolvimento de habilidades. O professor deve ter em conta a contextualização do conhecimento e partir do centro de interesse dos alunos, para promover atitudes em novos procedimentos baseados na inovação, promovendo competências que predisponham o aluno à motivação e ao envolvimento. Em conclusão, sugere-se que novos estudos levem em consideração os resultados encontrados neste estudo. Isso poderia favorecer a aquisição de conhecimento baseado na cooperação e motivação, no pensamento divergente e na inclusão dos alunos.

1. INTRODUCTION

In today's society, coherent training is needed to respond to the presence of technologies and processes of social transformation. Teaching in 21st century Higher Education classes must be guided by a pedagogical method based on active and dynamic approaches (García-Cano et al., 2017), where a culture of peace and a good coexistence among the various educational agents are established (Gázquez et al., 2009). Consequently, the integration of Information and Communication Technologies (ICT) in the university context and within the framework of an education in equality and equity requires a competent teaching staff, both from a technological and pedagogical point of view (Fernández-Batanero et al., 2022). In this direction, teachers must avoid any type of antisocial behavior (Gázquez et al., 2015), attending to the demands required by the context (Sáez-López et al., 2020) and where their performance fosters learning (Gonzales, 2022). Hence, the way in which universities prepare their students for their academic and professional future is changing (Khezrlou, 2019). Therefore, nowadays, creative thinking should be promoted with the help of new techniques, so that innovation and divergent thinking are promoted in a pleasant environment (Shirazi et al. 2020). Consequently, the teacher must know how to transmit knowledge that favors the improvement in the coexistence of citizens (Martí-Belda et al., 2019).

In education we find ourselves in a new era, that of the Internet, creativity and the formation of innovative students (Fu, 2019). Adolescents live immersed in a digital world and are more familiar with the use of electronic devices (Pérez-Fuentes et al., 2019). Thus, basic teaching methods are required to keep up with the constant technological change (Felszeghy et al. 2019; Kouti et al., 2018). Among the main objectives of ICT use is the attempt to seek greater participation in the development of classes and improve motivation (Juan et al., 2018; Lopez et al. 2019; Santos et al. 2016). Therefore, the educational system and policies should boost innovation to increase job opportunities for graduates (Micheal & Marjadi, 2018).

Particularly, in all areas of knowledge in Higher Education, regardless of location, efforts are being made to align research and innovation processes with social values and needs and thus create mechanisms for inclusive priority setting (Guinau et al., 2017). To achieve this, teachers must base their methodology on a process that

José Soriano-Sánchez; David Jiménez-Vázquez

fosters creativity (Liu et al. 2020). Moreover, he/she has to take into account that the university lifestyle creates unhealthy lifestyle habits, given the long study periods, increased nightlife, lack of assumptions, etc. Therefore, the teaching practice should carry out active methodologies that awaken the interest of students, for example, gamification, in order to respond to educational needs (Mora-González et al., 2020).

In the previous sense, it is necessary to know how to connect with the knowledge to be transmitted, so that the co-construction of knowledge is enhanced through participation to adjust a quality educational response (Arbea et al., 2019; Gros & Cano, 2021). In fact, with the new adaptation to the European Higher Education Area (EHEA), numerous changes have been generated in universities (Buela-Casal et al., 2019). This fact has made it necessary to enhance quality education (Osca-Lluch et al., 2019). To promote quality education, it is necessary to take into account the individual circumstances of the student, as they will be different one from another, so as to favor the personalization of learning through accessibility (Pakpour et al., 2019). In this sense, for those students who manifest poorer health in their personal well-being, it would be interesting to consider programs based on mindfulness, as they suggest a positive impact on the quality of life of the person (Soriano et al., 2019). This has been proven thanks to the benefits provided by recent literature on systematic reviews (Soriano-Sánchez, 2022) and meta-analytical studies (Pérez-Fuentes et al., 2020). Learning is conceived as a cognitive and emotional process, where the promotion of the student's quality of life, as well as the teaching and learning process (Galleguillos-Herrera & Olmedo-Moreno, 2019), must be consented in order to increase their academic engagement (Tortosa et al., 2020) and the avoidance of psychoactive substance use (Oksanen et al., 2021).

In turn, educational innovation should help to improve learning and understanding of different concepts to achieve the desired ends (Rodríguez et al., 2019). The new map of degrees shows the emergence of more suitable professional profiles (Torres et al., 2018). In particular, to meet the needs of university students studying other languages, the methods and materials used should be diverse (Kartal & Simsek, 2017; Rehman et al., 2022). Therefore, educational practices in Higher Education should be based on those challenges that society requires (Avalos et al., 2019), so that the teaching-learning sequences allow the previously established curricular objectives to be achieved (Guisasiola et al., 2017). In addition, it seems that the commitment to effective educational practices based on students' perceptions is associated with better self-esteem in students (Lera et al., 2021).

In particular, a method that is being adopted in Higher Education classes is the "Flipped classroom" method. For this, the class is divided into small groups, where students work in teams in carrying out projects, with the teacher acting as a guide or coach before teaching and learning (Yelamarthi et al., 2016). In this way, a sensible approach seems to be promoted, increasing knowledge about college students (Yang et al., 2018). In another sense, an alternative approach can be based on the application of Gamestorm (a methodology that considers the use of games in a brainstorming process), where a problem is presented through the game that circumvents conventional teaching and unleashes creative thinking to solve challenges (Feijoo et al., 2018). However, students often seek self-directed preparation opportunities to advance, as the tools used in class are not sufficient (Tang et al., 2017). In addition, the pandemic caused by COVID-19 seems to affect the psychological health of the individual (Molero et al., 2020), so substantial innovation is demanded to respond to the needs of the student body, through the use of virtual environments where optimal development and learning is guaranteed (Day et al., 2021). Therefore, the objective of this paper is to identify, through a systematic review, different innovative educational practices in Higher Education.

José Soriano-Sánchez; David Jiménez-Vázquez

2. METHOD

Resources and search formula

The present systematic review was performed following the PRISMA recommendations (proposals for the publication of systematic reviews), proposed by Moher et al. (2009). The following databases were used for the search: Scopus and Web of Science. The following search formula was used: ((teaching innovation) AND (university students)); as well as ((teaching innovation) AND (university students)). Regarding the search filters used in both databases were: articles published in the last five years, that is, from 2016 to March 2020 and empirical studies. Regarding the language search filter, only papers in English and Spanish were applied to the Scopus database. On the other hand, it was not possible to apply this filter in Web of Science. The search was carried out in March 2020.

Inclusion and exclusion criteria

The inclusion criteria for the selection of studies were: (a) empirical studies; (b) language of publication in English or Spanish; (c) works that apply innovative educational practices in Higher Education; (d) research that shows the results before and after the teaching practices; and (e) studies carried out in the university institution in face-to-face mode.

The exclusion criteria for job selection were: (a) works on other related issues (related to teaching practice, the learning process or other educational stages); (b) research with a lack of pretest results; (c) systematic review works; and (d) qualitative, descriptive or documentary analysis studies.

Procedure

Figure 1 shows the flow chart corresponding to the document selection process. A total of 1470 articles were identified in the different electronic resources. Specifically, 699 research papers were obtained from Scopus and 771 from Web of Science databases. Of the total, 86 were excluded for being duplicates and 6 for not allowing access to the full text, leaving 1378 papers. Subsequently, a total of 1358 studies were eliminated for various reasons. Specifically, 124 papers were eliminated for being of the documentary type, reviews, and qualitative or descriptive analysis type; 17 for being in languages other than English or Spanish; 6 for not showing results in the initial evaluation; and 1210 for being of other issues, in relation to the established exclusion criteria. Finally, the sample consisted of 21 papers.

José Soriano-Sánchez; David Jiménez-Vázquez

Figure 1

Innovative educational practices in Higher Education: PRISMA flow chart with the steps in item selection

José Soriano-Sánchez; David Jiménez-Vázquez
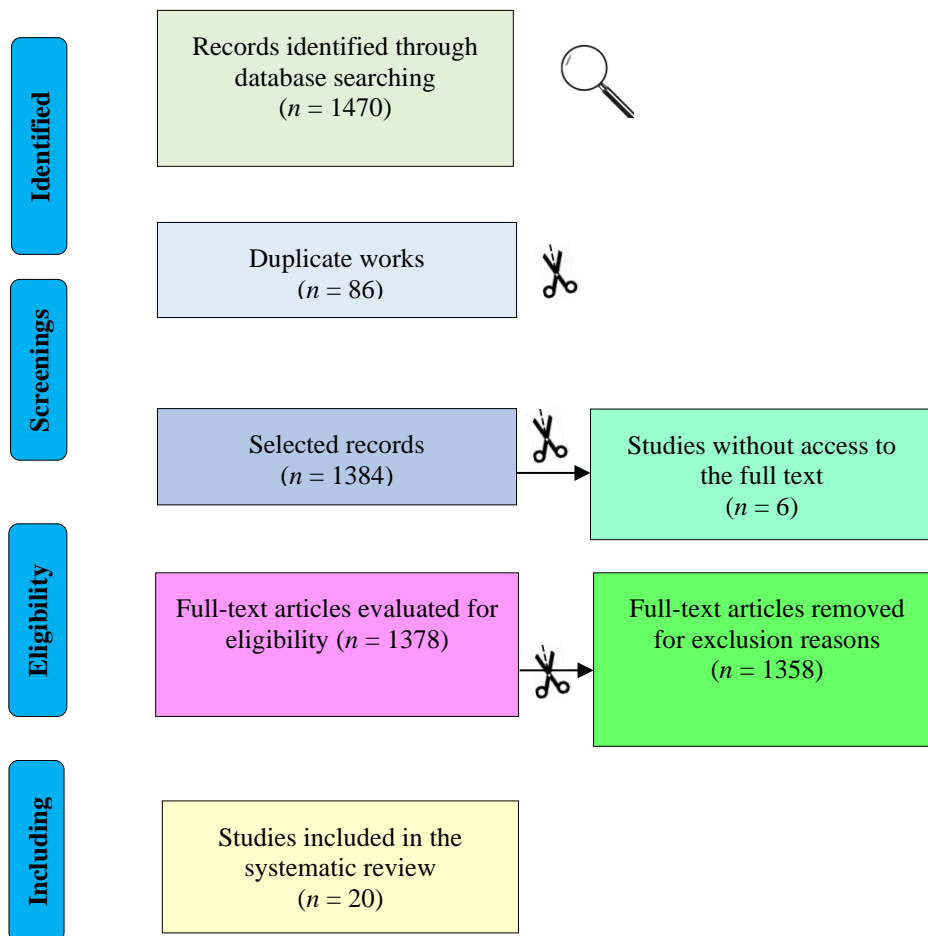
3. RESULTS AND DISCUSSIONS

Data extraction

For data extraction, a form was designed that included those aspects of the established inclusion criteria (authors, year of publication, area of knowledge, objective, country/state and main results), as shown in Table 1. With the help of this, the most relevant elements of each of the studies were extracted. This process was carried out rigorously, ensuring maximum reliability in the collection of information by the two principal investigators (DJV and JGSS).

Description of selected studies

The present work comprises a total of 20 studies corresponding to publications related to teaching innovation practices in Higher Education. In this sense, as can be seen in Table 1, as of 2019 there was an increase in teaching innovation practices in the university context.

In relation to the Country/State where a greater number of studies have been carried out was Spain, with a total of ten works, followed by China and Iran, presenting three studies in both cases. Australia, Finland, Costa Rica, Minnesota, Minnesota, Turkey and Michigan presented one study. All the studies presented their results before and after the teaching innovation practice.

As for the objectives and results of the different papers, they can be seen in Table 1 below:

José Soriano-Sánchez; David Jiménez-Vázquez

Table 1

Summary of studies examining innovative educational practices in higher education

Author	Year of publication	Area	Aim	Country/State	Main results
Mora-González et al.	(2020)	4	Examining the effects of a gamification-based program on cardiorespiratory fitness levels in students	Spain	Motivating through gamification can lead to health and learning improvements
Liu et al.	(2020)	3	Evaluating the effectiveness of a teaching module for creativity on improving learning and teaching self-efficacy in creativity	Chinese	Facilitates student creativity, enhances teaching behavior and improves self-confidence with respect to student creativity
Sáez-López et al.	(2020)	4	To evaluate the impact, practices and attitudes generated from Augmented Reality (AR) in the initial training of future teachers	Spain	They emphasize the need for initial training to be able to design and apply AR practices in teaching
Shirazi et al.	(2020)	3	To determine the effect of technical simulation using the Goldfish Bowl method on students' creative thinking	Iran	Goldfish Bowl technique is recommended for use in medical students' learning to promote divergent thinking
Kartal & Simsek	(2017)	1	Improve students' listening comprehension skills by providing them with basic phonetic notions and transcription training through the use of software	Turkey	The results obtained were slightly higher in the final test in most cases, suggesting a positive impact
Khezrlou	(2019)	1	Explore attitudes toward reading software to promote vocabulary acquisition and reading comprehension	Iran	Students improved their vocabulary learning and reading comprehension in English
Felszeghy et al.	(2019)	3	Analyze ratings after Kahoot use and the effects of gamification on learning and enjoyment	Finland	The use of gamification in the teaching of histology can provide a basis for designing an integrated curriculum across the health disciplines
Fu	(2019)	3	Using the "creator education + SPOC" teaching model in political economy courses	Chinese	The model can positively influence the teaching effect of political economy courses
López et al.	(2019)	4	Eliminate negative prejudices, fear and rejection attitudes towards science, encouraging conceptual and procedural learning among students through gamification	Spain	Students increase their motivation and self-perception of their newly acquired skills to implement gamification in their professional future
Rodríguez et al.	(2019)	5	To help improve the teaching and understanding of different concepts to obtain better results through gamification	Spain	Results show high student motivation, increased participation and better results (grades) on homewor gamification

José Soriano-Sánchez; David Jiménez-Vázquez

Table 1

Summary of studies examining innovative educational practices in higher education (continuation)

Author	Year of publication	Area	Aim	Country/State	Main results
Ávalos et al.	(2019)	4	Analyze the Lean Startup method as a learning methodology in the creation of digital and research competencies	Costa Rica	The results revealed the effectiveness of an innovative methodology such as lean startup in developing digital and research skills and changing the teaching role
Micheal & Marjadi	(2018)	3	Develop a reverse classroom workshop on gender and sexuality	Australia	Promoted a gender-sensitive approach to patient care that could help students avoid stereotypes and provide comprehensive care
Torres et al.	(2018)	4	Redefining the concept of educational e-innovation using ICTs	Spain	Results reveal that the use of ICTs improves employment and career development opportunities
Feijoo et al.	(2018)	5	Develop creativity and teamwork through the use of computerized games	Spain	Creativity was enhanced in the progress of teamwork, increasing decision making
Tang et al.	(2017)	3	Evaluating the practice and effectiveness of a pharmacy elective using ICTs	Minnesota	Students confirm the benefits of learning with the use of ICTs, showing increased interest
Guinau et al.	(2017)	2	To present a virtual tool to improve information management during collaborative work and to facilitate the availability of information	Spain	They explain the usefulness of wikis as a virtual tool for collaborative work, especially in the first academic year
Santos et al.	(2016)	2	Improve the level of participation in seminar training classes and lay the groundwork for a new evaluation system through the use of ICTs	Spain	The use of ICT application improves the quality of education, increases class attendance and increases student satisfaction
Yelamarthi et al.	(2016)	5	Strategically improve the traditional methodologies invested in a first-year engineering course through the use of ICT and proven pedagogical techniques to enhance learning	Michigan	Student learning is enhanced through the implementation of multi-pedagogical strategies shaped by instructional design in a traditional setting
Kouti et al.	(2018)	3	Comparison of the effectiveness of three educational methods (e-learning, lectures and combination) on the knowledge of pharmacy students	Iran	The use of a blended method in conjunction with an e-learning approach positively influences student knowledge
Juan et al.	(2018)	5	Designing interactive teaching using AR to improve the learning efficiency of a mechanical drawing course	Chinese	Students who use the use of AR in learning show a greater special ability, being interested in learning and studying after class
Guisasola et al.	(2017)	2	To present a proposal for the design and evaluation of teaching and learning sequences through the use of ICTs	Spain	It is a central component of the field of science education to redesign the teaching-learning sequence

Note. Areas of knowledge: 1 = Arts and Humanities; 2 = Science; 3 = Health Sciences; 4 = Social and Legal Sciences; 5 = Engineering and Architecture.

Rev. innova educ. Vol. 5. No 1 (2023) pp. 23-37

30

José Soriano-Sánchez; David Jiménez-Vázquez

Thus, it is the area of Health Sciences that showed the greatest number of investigations, followed by Social and Legal Sciences, Engineering and Architecture, the area of Sciences and, in last place, the area of Arts and Humanities. In this sense, the teaching innovation methods and instruments used in each of the following areas were:

For the Health Sciences area, techniques such as a didactic innovation module for the development of skills and divergent thinking (Liu et al., 2020), the Goldfish Bowl method (Shirazi et al., 2020), the use of game-based online platforms (Felszeghy et al., 2019), the "maker education + SPOC" application model (Fu, 2019), as well as in-class presentations and discussions (Tang et al., 2017) and lectures, teaching from electronics and blended learning (Kouti et al., 2018).

In Social and Legal Science, gamification was used (López et al., 2019; Mora-González et al., 2020), a program based on Augmented Reality (AR) which, in this case, was carried out by Sáez-López et al. (2020), the Lean Startup method as a teaching methodology in the formation of digital competencies (Ávalos et al., 2019) and the teaching method called "learning to do" where students are guided to understand, internalize and apply the potentialities of technology (Torres et al., 2018).

As for the area of Engineering and Architecture, the inverted classroom and peer instruction and gamification were used (Rodríguez et al., 2019), as well as, the method called Gamestorming that considered the use of games in the process of elaboration of ideas (Feijoo et al., 2018) and, finally, the use of AR through the mobile (Juan et al., 2018).

In Science, the implementation of teaching-learning sequences (Guisasola et al., 2017), the use of wikis (Guinau et al., 2017), the use of App (Santos et al., 2016) and the use of technology through the inverted model (Yelamarthi et al., 2016) were used as working methods. Finally, in the Arts and Humanities knowledge area, audiobooks (Kartal & Simsek, 2017) and program reading using the computer (Khezrlou, 2019) were used.

The aim of this study was to identify, through a systematic review, innovative educational practices in Higher Education. In this sense, Mora-González et al. (2020) examine in the area of Social Sciences and Law the influence of gamification thanks to the teaching innovation program "The Matrix rEFvolutions", allowing to observe after its implementation an improvement in student learning. On the other hand, it has been seen that the effectiveness of training methods in creative skills significantly improves learning and imagination (Liu et al., 2020; López et al., 2019). Programs based on the use of AR (user perception of the real world in real time), enhance cooperation and motivation (Sáez-López et al., 2020). In fact, the development of digital skills favors proactive behaviors such as self-regulation, critical thinking, self-motivation, leadership, communication and empathic skills (Ávalos et al., 2019; Gros and Cano, 2021).

In the area of Health Sciences, gamification has been used by creating an educational environment based on debate. In this way, the use of critique on a specific topic has been found. Consequently, it has been related to the development of creativity (Shirazi et al., 2020) and the increase of knowledge (Kezrlou, 2019). In turn, it is considered relevant for students to increase their ability to innovate from challenge-based learning (Yang et al., 2018), in which values are fostered to develop in society (Micheal & Marjadi, 2018).). Therefore, teaching in Higher Education should focus on participation in debates on current and emerging issues (Tang et al., 2017), from new educational models such as "Maker education + SPOC", by suggesting the scope of new knowledge. This, thanks to an open and collaborative teaching process, through flexible teacher-student communication (Fu, 2019). On the other hand, in the area of Arts and Humanities, audiobooks have been used to promote the

learning of English, increasing the enjoyment of reading (Kartal & Simsek, 2017). New methods applied in reading intervention promote positive attitudes for reading, as well as vocabulary growth (Khezrlou, 2019).

As part of the Engineering and Architecture area, the inverted classroom is implemented, which allows the teacher to concentrate on the most difficult parts of the lessons. In this method, students present a more active and meaningful learning versus the traditional teaching method (Rodriguez et al., 2019; Yelamarthi et al., 2016). Thus, the use of technology, such as mobile Apps is related to a greater interest in learning (Juan et al., 2018).

In general, the use of ICT tools and the use of wikis offer both students and teachers the possibility of active learning and teaching (Kouti et al., 2018; Torres et al., 2018). Therefore, the acquisition of knowledge through play inspires engagement and the development of creativity (Feijoo et al., 2018). In that direction, this favors the principle of socialization, through the use of interactive games and the promotion of cooperation in classes (Santos et al., 2016).

Tortosa et al. (2020), indicate that when students are more motivated, they suggest showing greater academic engagement (Tortosa et al., 2020). In another line of research, it is revealed that motivation is related to the improvement of interpersonal relationships among all educational agents, which favors the climate of coexistence in this academic stage (Gros and Cano, 2021). In turn, it would be interesting to take into account that the establishment of specific plans for teacher training and advice on the use of technologies can help people with disabilities, favoring their accessibility and inclusion in the teaching and learning process (Fernández-Batanero et al., 2022).

This work is not free of limitations. On the one hand, one of them corresponds to the selection of databases for the search of studies, since the databases chosen were Scopus and Web of Science, so it is possible that works published in other electronic resources may have been unintentionally omitted. On the other hand, another limitation lies in the lack of pretest results, which has prevented their inclusion in the present investigation.

Due to the great impact of innovation, in order to broaden knowledge on this topic, as a future line of research, it is recommended that new studies, regardless of the area of knowledge in question, should include the results of this research. In this way, new teaching and learning methodologies oriented to the acquisition of key competences in a creative and dynamic context would be promoted, favoring the improvement of the teaching and learning process.

4. CONCLUSIONS

The results obtained allow different university institutions and, in particular, teachers to acquire new knowledge about new methodologies in the different areas of Higher Education. Thus, they could carry out new teaching innovation practices encouraging participation, cooperation, inclusion, motivation and the acquisition of new knowledge by university students.

The teaching praxis should be based on innovative methodologies, favoring teaching and the development of competencies. In this sense, through new teaching techniques and strategies based on technological support, the acquisition of knowledge based on cooperative work, critical and reflective thinking, the achievement of curricular objectives and effective problem solving could be promoted. On the other hand, the teacher has to consider the contextualization of knowledge to promote new attitudes and teachings. At the same time, it would be interesting to develop skills and competences that predispose the university student to the acquisition of exchanges and the correct integration to these.

José Soriano-Sánchez; David Jiménez-Vázquez

Therefore, it would be interesting to promote a respectful learning climate in Higher Education, based on collaborative and active methodologies that encourage the promotion of activities through the use of ICT and that guarantee the motivation and well-being of its members.

In conclusion, from the above, students could present a proactive attitude through the use of innovative methods. In fact, they could acquire media competencies through a more reflective and creative behavior in the different areas and situations of the teaching and learning process, enhancing cognitive processes that favor innovation in learning and, with it, the development of skills for the transferability of new knowledge.

Conflicto de intereses / Competing interests:

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Howard Moreira: Conceptualización, análisis formal, investigación, metodología, administración del proyecto, recursos, software, supervisión, validación, visualización, escritura -preparación del borrador original, escritura -revisar & amp; edición.

Ronald Bravo: Conceptualización, metodología, administración del proyecto, software, escritura -preparación del borrador original, escritura -revisar & amp; edición.

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José Soriano-Sánchez; David Jiménez-Vázquez

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José Soriano-Sánchez; David Jiménez-Vázquez