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REVIEW ARTICLE

A systematic review of the use of ICT and emotional intelligence on motivation and academic performance

Una revisión sistemática de la utilización de las TIC e inteligencia emocional sobre la motivación y el rendimiento académico

对使用 ICT 和情商对动机和学业成绩的系统评价

Uma revisão sistemática do uso das TIC e da inteligência emocional sobre motivação e desempenho acadêmico

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KEYWORDS

emotional intelligence, motivation, ICT, academic performance, systematic review.

ABSTRACT. The purpose of this research was to identify through a Systematic Review (SR) the relationship between Emotional Intelligence (EI) and the use of Information and Communication Technologies (ICT) on student motivation and academic performance. For this purpose, two searches were carried out in scientific electronic resources, such as Web of Science, Scopus, PubMed, PsycINFO and Dialnet. In this way, a total of 98 studies were obtained which, after applying the inclusion and exclusion criteria, left a total of 39 papers for review. The results show that EI and the use of ICTs have a positive relationship on motivation and academic performance. The most relevant conclusions suggest that the level of EI favors personal well-being, the improvement of school coexistence and the correct use of ICT. Likewise, the use of digital resources in the educational context increases motivation, academic performance and the achievement of curricular objectives in the different educational stages. However, it is suggested that further research should be carried out to confirm the findings of this paper.

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PALABRAS CLAVE

inteligencia emocional, motivación, TIC, rendimiento académico, revisión sistemática.

RESUMEN. El propósito de esta investigación consistió en identificar a través de una Revisión Sistemática (RS) la relación entre Inteligencia Emocional (IE) y uso de las Tecnologías de la Información y Comunicación (TIC) sobre la motivación y el rendimiento académico del estudiante. Para ello, se han realizado dos búsquedas en los recursos electrónicos de carácter científico, tales como Web of Science, Scopus, PubMed, PsycINFO y Dialnet. De este modo, se han obtenido un total de 98 estudios que, tras aplicar los criterios de inclusión y exclusión, quedaron un total de 39 trabajos para revisión. Los resultados muestran que la IE y el uso de las TIC guardan una relación positiva sobre la motivación y el rendimiento académico. Las conclusiones más relevantes apuntan que el nivel de IE favorece el bienestar personal, la mejora de la convivencia escolar y el correcto uso de las TIC. Asimismo, la utilización de recursos digitales en el contexto educacional incrementa la motivación, el rendimiento académico y el logro de los objetivos curriculares en las diferentes etapas educativas. No obstante, se sugiere seguir realizando nuevas investigaciones, de manera que permitan confirmar los hallazgos señalados en el presente trabajo.

关键词

情商、动机、信息通信技术、学习成绩、系统评价。

抽象的。本研究的目的是通过系统评价 (SR) 确定情商 (EI) 与信息和通信技术 (ICT) 的使用对学生动机和学业成绩之间的关系。为此，在科学电子资源中进行了两次搜索，例如 Web of Science、Scopus、PubMed、PsycINFO 和 Dialnet。这样一来，共获得98篇研究，应用纳入和排除标准后，共有39篇作品待审。结果表明，EI和ICT的使用与动机和学业成绩呈正相关。最相关的结论指出，EI水平有利于个人幸福感、学校共存的改善和ICT的正确使用。同样，在教育背景下使用数字资源可以提高不同教育阶段的动力、学习成绩和课程目标的实现。但是，建议继续进行新的调查，以确认这项工作中指出的调查结果。

PALAVRAS-CHAVE

inteligência emocional, motivação, TIC, desempenho acadêmico, revisão sistemática.

RESUMO. O objetivo desta pesquisa foi identificar, por meio de uma Revisão Sistemática (RS), a relação entre Inteligência Emocional (IE) e o uso de Tecnologias de Informação e Comunicação (TIC) na motivação e desempenho acadêmico dos alunos. Para isso, foram realizadas duas buscas em recursos eletrônicos científicos, como Web of Science, Scopus, PubMed, PsycINFO e Dialnet. Dessa forma, obteve-se um total de 98 estudos que, após a aplicação dos critérios de inclusão e exclusão, deixaram um total de 39 trabalhos para revisão. Os resultados mostram que a IE e o uso das TIC têm uma relação positiva com a motivação e o desempenho acadêmico. As conclusões mais relevantes apontam que o nível de IE favorece o bem-estar pessoal, a melhoria da convivência escolar e o uso correto das TIC. Da mesma forma, o uso de recursos digitais no contexto educacional aumenta a motivação, o desempenho acadêmico e o alcance dos objetivos curriculares nas diferentes etapas educacionais. No entanto, sugere-se continuar realizando novas investigações, a fim de confirmar os achados indicados neste trabalho.

1. INTRODUCTION

Currently, education is immersed in a new era: that of the Internet, creativity and the formation of innovative students (Fu, 2019; Frolova et al., 2019; Soriano-Sánchez & Jiménez-Vázquez, 2022a). Adolescents live immersed in a digital world and are more familiar with the use of electronic devices. Thus, basic teaching methods are required to keep up with the constant technological change (Felszeghy et al., 2019). Among the main objectives of the use of Information and Communication Technologies (ICT) are to try to seek greater participation in the development of classes and to improve motivation (Juan et al., 2018). For its part, the educational system and policies should boost innovation to increase the employability opportunities of graduates (Micheal & Marjadi, 2018). Consequently, it is necessary that the migration process from traditional teaching to teaching based on the virtualized environment be carried out worldwide and thus break with the known paradigms, characterized by the passivity of learners (Amaya-Conforme & Yánez-Rodríguez, 2021; Bullón-Solís,

2020). In this direction, the use of gamification in the classroom seems to innovate and improve the profile of students, as they feel more motivated and participative (Gil & Prieto, 2020; Soriano-Sánchez & Jiménez-Vázquez, 2023).

Emotional Intelligence (EI), understood as the ability that allows the being to manage, understand, select and control their emotions and those of others (Goleman, 1995), helps students to make important decisions in stressful situations, avoiding states of anxiety and negative feelings of burnout related to the academic environment, as well as a better self-perception regarding their own emotions, self-confidence, increased empathy and respect for others (Azilah et al., 2020). Thus, it is relevant that EI education should be carried out from the earliest ages, since it has an impact on the well-being of students and their academic performance (Puertas-Molero et al., 2020), the avoidance of the consumption of psychoactive substances (Soriano-Sánchez & Jiménez-Vázquez, 2022b), as well as the avoidance of harmful behaviors such as, for example, Fear of Missing Out (Soriano-Sánchez, 2022). Other lines of research have exposed the relationship between EI and motivation, showing a greater increase in motivation when students are able to understand their own state of mind. They also have lower levels of anxiety and feelings of guilt. This fact leads to positive feedbacks among students, as well as between students and teachers, since it promotes clarity and attention to emotions (Mengual-Andrés et al., 2020). Therefore, the effective resolution of conflicts, creating an enriching classroom climate, strengthening feedback in their interpersonal relationships (Cera et al., 2015) and increasing their academic engagement (Tortosa et al., 2020).

Authors such as Amador-Licona et al. (2021), have pointed out through their research how EI is positively related to student motivation and, with it, to greater academic success, with the factors that most influence their own motivation being: the teacher, the content, the method/process and the environment. Motivation is optimized when students are immersed in a wealth of motivating experiences (Ohuerrou et al., 2019). Even so, when students are not self-motivated, i.e., do not present a good level of EI, they present a higher risk of lower academic performance because their motivation would be conditioned by the environment and not by themselves. Lee et al. (2016) found that intrinsic motivation has a strong and positive effect on academic performance, while extrinsic motivation has a weak and non-significant effect on engagement. However, external rewards could be acceptable approaches to stimulate learners' drive in school, as well as classroom culture based on increasing curiosity and interest about a subject (Cabero-Almenara et al., 2019). Jiménez-Blanco et al. (2020), corroborate that EI is considered a predictor construct of academic achievement, having to be developed throughout life (Alenezi, 2020; Azilah et al., 2020) and, specifically, in the earliest stages (Ahmad et al., 2015).

The present study

As of today, different literature review researches have been done to analyze the existing relationship between conflict resolution in the classroom and ICT (Cano et al., 2020; Prieto et al., 2020). Likewise, as well as on the use of ICT and motivation (Gómez et al., 2020), academic performance (Hinojo et al., 2019; Méndez & Boude, 2021) and, even, on gamification, research have been carried out that have analyzed the relationship between EI and motivation, such as those presented by Fernández-Espínola and Almagro (2019). However, until our scope, no literature review has been carried out that identifies the influence that EI and the use of ICTs have on the motivation and academic performance of students. That is why the following general research objective is proposed: Therefore, the purpose of this research is to identify through a Systematic Review (SR) the relationship

between EI and the use of Information and ICT on student motivation and academic performance. In this direction, the specific objectives are: (a) To relate the importance of EI on the use of ICT in students and/or teachers; (b) To analyze the relationship between the use of ICT and motivation in students; and (c) To recognize the influence that motivation has on the academic performance of students. Based on the empirical evidence, the following hypotheses are proposed: H.1. EI is expected to contribute positively to the use of ICTs by students or teachers; H.2. The use of ICTs has a considerable influence on student motivation; H.3. Motivation has a positive effect on academic performance and ICT use among students.

2. METHOD

This research is based on a Systematic Review (SR) of the literature. That is, it is an exploratory SR, using an observational and retrospective design, whose purpose is to analyze and synthesize the results found in the different studies from different primary studies, in order to answer specific questions posed by the researcher (Manchado et al., 2009).

Search procedure and strategies

For the elaboration of the SR, the steps proposed by the PRISMA statement were followed, in order to make the correct judgments that emerge on this type of studies, so that the best transparency, quality and consistency can be exposed on the methodological information and results presented therein (Moher et al., 2015). Consequently, a search for scientific research was carried out in different electronic resources. Specifically, the international databases Web of Science, Scopus, PubMed and PsycINFO were used, as well as the national electronic resource Dialnet.

The following search formulas were used in all the databases: (emotional intelligence) AND (use information and communication technologies) AND (education). As well as, (use information and communication technologies) AND (motivation) AND (academic performance) AND (education). First, a search was carried out in Web of Science, where the first search formula described above was introduced. Subsequently, the second search was performed and, in this case, after seeing the variety of documents presented, the filter "scientific article" was selected. Subsequently, for searches in the Scopus database, the "article" filter was also applied, given the large number of papers on reviews and conference papers. Thirdly, with respect to the electronic resource PubMed, the filters for both searches were also "randomized controlled trial". The rest of the documents were related to meta-analysis, SR, books, among others. As for the fourth search, use was made of the PsycINFO database, where the filter "scientific journals" was applied for both searches.

Finally, with respect to the national electronic resource Dialnet, no filter was applied in either of the two searches, given the small number of papers presented therein. Furthermore, in order to avoid the risk of bias in terms of time of publication, the search was carried out without time limitation. On the other hand, in the process of compiling the papers, after filtering the articles, the titles presented in the different electronic resources were transferred to an Excel spreadsheet, where all the information obtained was organized and the structure suggested by PRISMA (Gómez et al., 2020) was followed. Thus, the data presented in the SR can be considered of quality since they are empirical evidence investigations. Therefore, a large number of conclusions about the line of research presented in this study could be drawn from them (Beneitez et al., 2020). However, in those cases in which there was some doubt, we proceeded to read the entire study. Regarding the timing of the search,

it was carried out between March 06 and 07, 2021. Finally, to facilitate the incorporation of references and bibliography and to avoid possible errors, the computer tool Mendeley (Elsevier, 2019) was used.

Inclusion and exclusion criteria

Taking into account the objective of the present AR, the following inclusion and exclusion criteria were established:

On the one hand, the inclusion criteria established for conducting the present research were: (a) papers published in English or Spanish; (b) empirical journal articles; (c) research that integrated EI and ICT in their variables; (d) papers analyzing the relationship between ICT use and motivation and/or academic performance; (e) sample studies consisting of students from any educational stage (from Early Childhood Education to Higher Education); and (f) case study research.

On the other hand, the exclusion criteria established were the following: (a) duplicate studies; (b) theoretical research; (c) research of other issues related to the different variables EI, motivation, academic performance, ICT use or students; (d) studies in a language other than English or Spanish; (e) doctoral theses; (f) research without access to the full text.

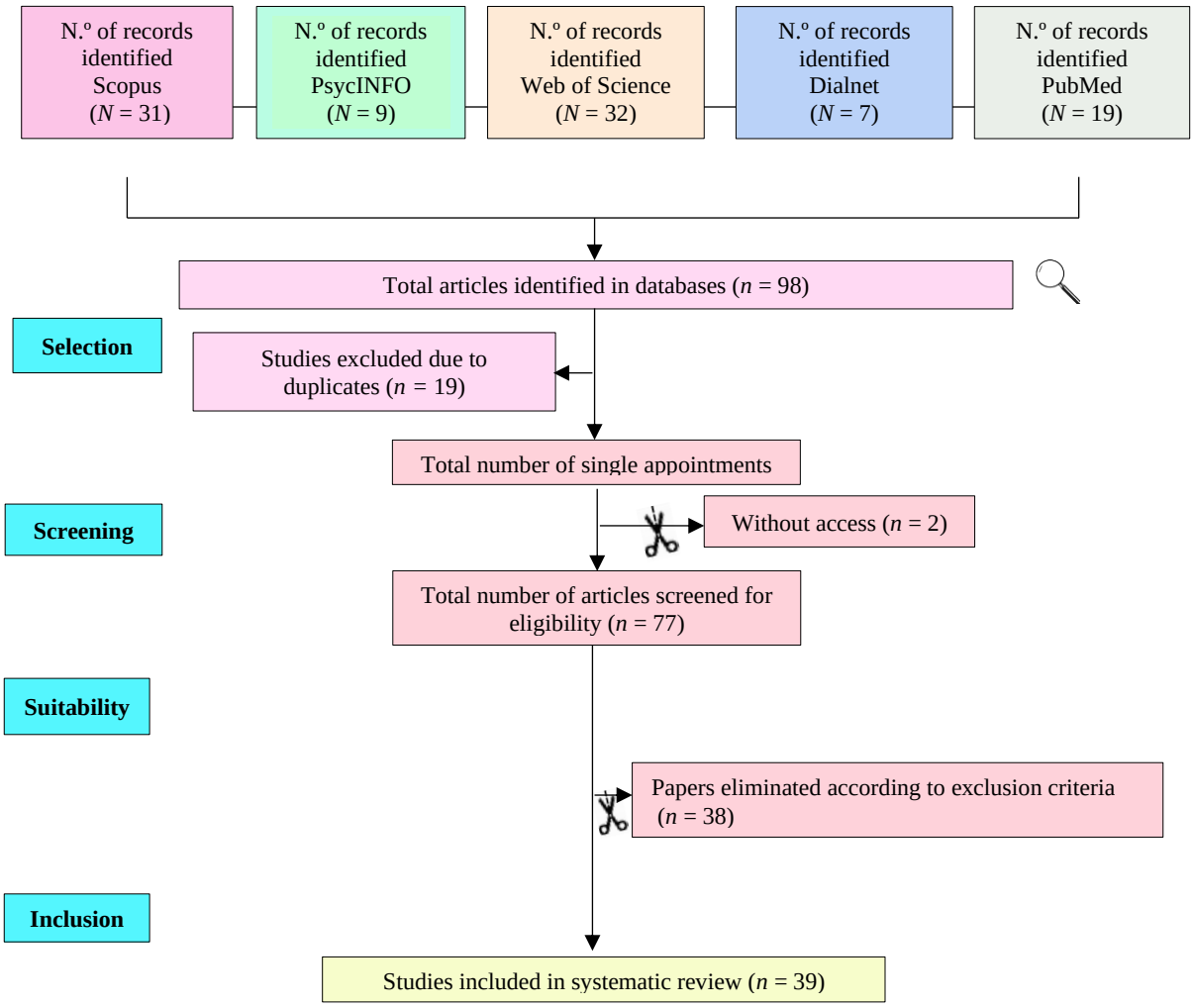
In a singular way, this review technique is carried out for the analysis of empirical studies, where diverse results on previously conducted research must be contrasted and which integrate a compendium of empirical evidence. The results obtained in each of the databases were: Web of Science (N = 32); Scopus (N = 31); PsycINFO (N = 9); PubMed (N = 19); and Dialnet

(N = 7). On the other hand, a total of n = 57 papers were eliminated, in relation to the various exclusion criteria. In this sense, n = 19 for being duplicated research; n = 4 for being documentary articles; n = 30 for dealing with other topics related to the use of ICT or EI, as well as for integrating both variables, but in contexts other than educational; and n = 3 for being published in a language other than English or Spanish, which, in this sense, were research written in Greek. Likewise, n = 2 research were eliminated, one because it corresponded to a book chapter and the other because it was a doctoral thesis. Finally, n = 2 papers were discriminated because they corresponded to the last exclusion criterion.

Last, the present SR is made up of a total of N = 39 investigations, as can be seen in the following flow chart (Figure 1).

Figure 1

PRISMA flowchart (selection of studies)



The main topic of interest of this SR is based on those studies that analyze the use of ICT, IE, motivation and/or academic performance of students at any educational stage. That is, from Early Childhood Education (3 years old) to Higher Education (university).

3. RESULTS

Description of selected studies

The present SR is made up of a total of N = 39 scientific papers. First, there are those studies that have analyzed the relationship between EI and ICT use (Ahmad et al., 2015; Alenezi, 2020; Azilah et al., 2020; Hijo et al., 2020; Jan et al., 2018; López-Faicán & Jaén, 2020; Mendoza et al., 2019; Ohuerrue et al., 2019; Okoye et al., 2020; Pozo-Rico et al., 2020). In another direction, there are other research that have evaluated the relationship between the use of digital tools, motivation and/or academic performance in students. In this sense, the different studies range from the Primary Education stage, such as the research carried out by Chen & Lin (2016), as well as Secondary Education (Huertas & Pantoja, 2016; López-Faicán & Jaén, 2020), Baccalaureate (Amaya-Conforme & Yánez-Rodríguez, 2021) and Higher Education stage, such as, for example, the study carried out by Mengual-Andrés et al. (2020). Thus, each of the research presented a different objective, as can be seen in Table 1 below:

Table 1

Authors, year of publication and objectives of the selected papers

Author	Year of publication	Aim
Ahmad et al.	(2015)	Examining the relationship between EI, communication and information technology skills among university students in Malaysia
Alenezi	(2020)	Investigating the influence of students' emotionality on their readiness for online learning programs
Amaya-Conforme & Yánez-Rodríguez	(2021)	To analyze the perception of high school students on the use of ICT in the learning of Mathematics
Ayari et al.	(2012)	To analyze the relationship between student involvement in the use of subject websites (through the number of accesses) and academic performance (grades)
Azilah et al.	(2020)	Analyzing the relationship between EI and performance in engineering students through the use of ICT
Bass et al.	(2013)	Investigating the relationship between ICT use, motivation and academic performance in an online Economics course final exam
Cabero-Almenara et al.	(2019)	Determine the degree of motivation between the use of augmented reality enriched notes in the classroom
Castaño et al.	(2015)	Testing students' academic performance through MOOC learning

Chang et al.	(2019)	Comparing two educational models to explore student activity
Chen & Lin	(2016)	Evaluate the willingness to use the u-learning methodology
Frolova et al.	(2019)	Analyze the advantages and problems of the implementation of the Moscow e-School project, the resources and limitations of ICT in the learning process
Gerhart et al.	(2015)	Understanding how students perceive their learning task by notebook use
Hinojo et al.	(2020)	Analyze the effectiveness of flipped learning with respect to traditional methodologies
Huertas & Pantoja	(2016)	To analyze the influence on students' academic performance and motivation, as well as to know the opinion of teachers and students on the use of ICTs and to know the opinion of teachers and students on the use of ICTs
Hung et al.	(2014)	To investigate whether the use of video-based reflective messages could promote learners' levels of reflection
Jan et al.	(2018)	Investigating the relationship between EI, anxiety and academic achievement
Kanorio	(2015)	Assess literacy levels, motivation for integration and impact through the use of ICTs
Kowitlawakul et al.	(2017)	To explore students' experiences and perceptions about the use of e-learning research module
Lin & Jou	(2013)	To test whether the use of web applications could be a potentially novel method of engaging teachers and students in meaningful teaching
Li-Ping y Jill	(2009)	To examine students' perceptions of enjoyment, learning, motivation, and professional application, across five teaching technologies (projector, PowerPoint, video, and Internet) and academic performance
López et al.	(2019)	Analyze objective and subjective measures of trainee performance in a blended learning approach
López-Faicán & Jaén	(2020)	Addressing the usability of two game styles and their impact on users' communication and motivation: competitive vs. collaborative gameplay

Pozo-Rico et al.	(2020)	To demonstrate the effectiveness of a teacher training program aimed at supporting elementary school teachers in four key areas: (1) coping with stress, (2) preventing burnout, (3) improving their ICT competence, and (4) introducing EI in the classroom.
Martínez-Sarmiento y Gaeta	(2019)	Develop and implement a virtual support program to promote self-regulated learning among university students through the cyclical PHVA (Plan, Do, Check and Act) process using the Moodle platform.
Matviichuk et al.	(2017)	To examine the ICT skills of teachers and the factors that slow down the process of using ICT for teaching
Mendoza et al.	(2019)	Develop a theory of approach between logical and affective emotional bonding when conducting educational research with the Moodle system
Mengual-Andrés et al.	(2020)	To determine the impact of external factors such as family context, autonomy, self-esteem and student motivation on the flipped learning approach
Mirete y García	(2014)	To analyze the relationships between student involvement in the use of didactic websites (through the number of accesses) and academic performance (grades)
Novo-Corti et al.	(2013)	Describe a methodology that combines assessment with multiple-choice tests through the Moodle virtual environment and assessment through traditional classroom exams
Ohuerrou et al.	(2019)	Explore the benefits of using ICTs to identify the ways in which emotions are involved during the learning process in Virtual Learning Environments (VLEs)
Okoye et al.	(2020)	Show that there is an unprecedented increase in the amount of text-based data in different ICT activities within educational processes that can be leveraged to provide useful strategic intelligence and improved insights
Pardo-Cueva et al.	(2020)	To analyze the relationship between satisfaction with the use of Padlet and academic performance
Reychav et al.	(2018)	Examining the relationships between network measures and learning performance from a social network analysis perspective

Rojano et al.	(2016)	To analyze the use of the blog and its positive influence to improve the students' perception towards the subject of chemistry
Sandí	(2020)	To analyze the degree of acceptance by teachers of the ICTs involved, in particular serious games, and to evaluate these competencies
Uziak et al.	(2018)	Evaluate the effectiveness and acceptance of the e-learning strategy by students
Valentín et al.	(2013)	Analyze the relationship between the different uses of ICT and learning outcomes, as well as between learning strategies and motivation and ICT use
Wei-Kai et al.	(2019)	To examine the effectiveness of using AR-based formative assessment to improve learning achievement and motivation
Zhao	(2015)	Matching teaching to actual social and business demand by applying the teaching method under study in teaching practice

Thus, as could be seen in Table 1 above that almost all the studieswere aimed at investigating on the different variables in the student body. In contrast, the studies conducted by Matviichuk et al. (2017) and by Lin and Jou (2013) were aimed at analyzing the influence of ICT on teaching staff. In addition, another study, was aimed at knowing the opinion of teachers and students on the use of ICT in the teaching of the subject (Huertas & Pantoja, 2016).

Regarding the place of publication, 13 investigations were carried out in Spain as, for example, those conducted by Hinojo et al. (2020) or Mengual-Andrés et al. (2020), followed by Taiwan, where 6 investigations were conducted (Chang et al., 2019; Chen & Lin, 2016; Hung et al., 2014; Lin & Jou, 2013; Wei-Kai et al., 2019). For its part, Ecuador shows that three investigations related to this topic have been carried out (Amaya-Conforme & Yánez-Rodríguez, 2021; Mendoza et al., 2019; Pardo-Cueva et al., 2020), as has the USA (Pardo-Cueva et al., 2009; Reychav et al., 2018; Uziak et al., 2018). In another direction, Malaysia shows two studies (Ahmad et al, 2015; Azilah et al., 2020), as does Mexico (Martinez-Sarmiento & Gaeta, 2019; Okoye et al., 2020).

In contrast, other places such as Saudi Arabia (Alenezi, 2020), China (Zhao, 2015), Costa Rica (Sandí, 2020), Kenya (Kanorio, 2015), Morocco (Ohuerrou et al.) and the Netherlands (Bass et al., 2013), research was conducted, respectively. Similarly, it happened in Pakistan (Jan et al., 2018), Russia (Jan et al., 2019), Singapore (Kowitlawakul et al., 2017), Texas (Gerhart et al., 2015) and Ukraine (Matviichuk et al., 2017), places where a study was conducted, in order to investigate on the different objectives exposed.

In relation to the number of participants was very varied from one study to another. Specifically, the study conducted by Sandí (2020) was integrated by only one subject (N = 1), being a case study. Other studies consisted of N = 8 (Kowitlawakul et al., 2017), N = 8 or N = 11 (Kowitlawakul et al., 2017), N = 8 or by N = 11 (Bass et al., 2013). However, other investigations were made up of N = 543 (Valentin et al., 2013), up to a

maximum of N = 700.790 participants (Mendoza et al., 2019). However, the study by Ayari et al. (2012), did not present the number of participants in the study. On the other hand, it was the study carried out by Huertas and Pantoja (2016) that conducted an intervention program, composed of two groups: one experimental and one control, both groups formed by a total of N = 97 students.

On the other hand, it has been in Higher Education or university stage, where a greater number of investigations have been carried out. On the other hand, no study related to the objective of this research was presented at the Early Childhood Education stage. With respect to the year in which most publications were made, the year 2020 is the one with the highest number of publications, with a total of n = 9 studies. Consequently, it could be said that there has been a great deal of interest in this subject in recent years and, with particular relevance, at the present time.

In sum, the papers used different innovative ICT resources to carry out their research. On the one hand, the use of software (Mendoza et al., 2019), as models or educational strategies to provide students with productive and positive learning experiences through the use of ICT (Okoye et al., 2020). Síntesis de los resultados hallados

Augmented Reality (AR) was applied through mobile devices (Cabero-Almenara et al., 2019; López-Faicán & Jaén, 2020; Wei-Kai et al., 2019). Similarly, digital tools were also used through gamification. That is, activities that use game elements and game principles, but are not games and are carried out primarily in the educational context (Sandí, 2020). For their part, Ahmad et al. (2015) applied measurement instruments to analyze students' ICT skills. Particularly, the Computer Efficacy Scale of Murphy, Coover and Owen (1989), as well as other questionnaires used in different studies (Alenezi, 2020; Amaya-Conforme & Yánez-Rodríguez, 2021; Frolova et al., 2019; Jan et al., 2018; Matviichuk et al., 2017).

Other authors integrated ICT tools such as audios, texts, graphics and animations in the subject to assess whether it improved students' learning (Huertas & Pantoja (2016), as well as educational pills (Hung et al., 2014) through iPads (Reychav et al., 2018). In another sense, the use of PowerPoint realization was also made to enhance the learning of new content (Li-Ping & Jill, 2009). In addition, the use of an e-learning methodology was carried out to enhance content acquisition through VAS (Ayari et al., 2012; Azilah et al., 2020; Kanorio, 2015; Kowitlawakul et al., 2017; Mirete and Garcia, 2014; Novo-Corti et al., 2013; Ohuerrou et al., 2019; Lopez et al., 2010; Uziak et al., 2018; Zhao, 2015). Example of this could be through the use of videoconferencing (Bass et al., 2013).

In contrast, e-textbooks were also used to analyze how their use interferes with student learning (Gerhart et al., 2015). In addition, the daily use of Web 2.0 from different Apps such as SkyDrive, Evernote, DropBox and Google Apps (Lin & Jou, 2013) or, on the other hand, the use of educational Blogs (Rojano et al., 2016). Similarly, other methodologies were also applied, such as Flipeed Classroom or flipped learning (Mengual-Andrés et al., 2020). Thus, students seem to acquire a greater understanding of knowledge by practicing it previously in an autonomous way (Hinojo et al., 2020).

The use of a technological tool called Padlet was used to evaluate their relationship with a new collaborative space in a dynamic way and, with it, to analyze whether it influenced student performance (Pardo-Cueva et al., 2020). In another way, specific courses were used for teaching staff, with the aim of improving their digital competencies and thus supporting their professional study in teaching-learning (Pozo-Rico et al., 2020). In

another direction, Chen & Lin (2016), made use of the u-learning teaching-learning methodology through the use of Tablet, so that students could understand with greater significance the knowledge imparted in the subject.

Massive Open Online Courses (MOOCs) have been understood as the latest evolution of networked learning. A MOOC is an online, open and massively participatory course (Castaño et al., 2015; Martínez-Sarmiento & Gaeta, 2019). For their part, Valentín et al. (2013), in addition to using the previous tool, also introduced email, web page design, chat and forums. Finally, the use of social networks, such as YouTube or Facebook, was also applied to enhance the completion of academic tasks (Chang et al., 2019). The results found by Ahmad et al. (2015) have exposed the positive and significant relationship between EI, communication skills and digital competencies. In fact, those students who presented a higher level in those factors showed an increase with respect to academic achievement. Thus, EI is a skill that can be developed with practice (Pozo-Rico et al., 2020), so that the regulation of one's own emotions can be favored through the adoption of pedagogical practices (Alenezi, 2020).

In turn, the study by Azilah et al. (2020) revealed the importance of empathy, self-motivation and social skills in the use of digital tools. As a consequence, students' academic achievement could be increased (Jan et al., 2018). Other recent study, such as that carried out by López-Faicán and Jaén (2020), in which they use AR and gamification, indicated that the use of playful activities not only provides the opportunity to express emotions during the game, but also allows identifying and learning about emotional awareness and regulation. In this direction, this could be possible thanks to the fact that digital connectivity facilitates emotional bonding during its use by being a reality close to the students' experiences (Mendoza et al., 2019). In short, emotions seem to be involved during the learning process in VLEs (Ohuerrou et al., 2019).

Today's education demands new and more innovative educational processes. From this approach, the use of ICT presents a great relevance for teachers to foster the teaching-learning process and achieve curricular objectives (Li-Ping & Jill, 2009; Okoye et al., 2020). In particular, when ICT is integrated into the curriculum, it appears to foster autonomy, motivation and cooperation among students (Frolova et al., 2019; Hinojo et al., 2020). In turn, the use of ICTs produces a positive effect on the teaching process, where the teaching figure has a fundamental role in applying innovative learning methodologies, as revealed by the results found by Amaya-Conforme & Yánez-Rodríguez (2021), in order to ensure teaching quality (Matviichuk et al., 2017).

Ayari et al. (2012), conclude that the use of ICT in carrying out academic activities outside the classroom favors student motivation (Mirete and García, 2014; Zhao, 2015). Likewise, it seems that students show greater participation by increasing their interest in the use of digital tools, which makes it easier to observe and analyze the goals of each student. These findings are related to those presented by Bass et al. (2013) or by Hung et al. (2014).

The results found in various researches point out that the use of ICT benefits students' motivation (Cabero-Almenara et al., 2019) and their academic performance (Gerhart et al., 2015; Wei-Kai et al., 2019). In this direction it is worth noting that there are no differences in terms of educational level. Authors such as Chen & Lin (2016) corroborate this about Primary Education, while Kanorio (2015) or Castaño et al. (2015), about Secondary Education and the results exposed by Chang et al. (2019), related to Higher Education.

The use of ICT allows students to inquire about new contents. Thus, it significantly improves knowledge acquisition and retention, as they are more motivated by the subject matter (Chen & Lin, 2016). Thus, VLEs play

a relevant motivational role, as they suggest allowing students to be more satisfied with their research, as pointed out in their research by López et al. (2010), as well as Valentín et al. (2013). In addition, when activities are conducted through EVAs it provides feedback to users (Kowitlawakul et al., 2017), both inside, as well as outside the classroom (Lin & Jou, 2013). In turn, as revealed by the results presented by Martínez-Sarmiento and Gaeta (2019), after analyzing the sample of their study, EVAs constitute virtual spaces for the promotion of autonomous and flexible learning processes, by eliminating spatiotemporal barriers between student-teacher, as well as favoring participatory and collaborative learning.

The results pointed out by other researches exposed that the use of ICT in the academic space propitiates the continuous enrichment of knowledge (Huertas & Pantoja, 2016). As well as, the promotion of equal opportunities, constituting a means of socialization (Sandí, 2020). The different ICT tools provide the basis for a citizenship adapted to the knowledge society (Mengual-Andrés et al., 2020; Pardo-Cueva et al., 2020). Therefore, the use of ICT in education, point to improve motivation, learning and academic performance of students (Novo-Corti et al., 2013; Reychav et al., 2018; Rojano et al., 2016; Uziak et al., 2018).

4. DISCUSSION

The objective of this research was to identify through a SR review the relationship between EI and ICT use on student motivation and academic performance. After reviewing the different studies, it could be said that EI skills have a positive influence on regulating feelings and making the learner an integral part of the teaching-learning process, so as to ensure its success through a ubiquitous teaching-learning methodology (Alenezi, 2020). The use of ICT in the educational context has a relevant role in increasing the motivation and academic performance of students, both in Primary Education (Chen & Li, 2016), Secondary Education (Frolova et al., 2019), Baccalaureate, as well as in Higher Education (Pardo-Cueva et al., 2020). In this direction, it should be noted that the teacher is considered a fundamental axis to promote the use of ICT and, with it, the motivation and achievement of curricular objectives by students (Amaya-Conforme & Yánez-Rodríguez, 2021).

In response to the first specific objective of our study, which was based on relating the importance of EI in students or teachers on the use of ICTs, authors such as Azilah et al. (2020) have revealed that EI is positively related to skills that promote adequate performance in the use of ICTs. These findings are related to other lines of research, in this case, in teachers, where the results indicate that teachers with a higher level of EI have an increase in their ability to cope with stressful situations and avoid burnout and, consequently, show greater involvement in introducing EI in the classroom, as well as an increase in media competencies (Pozo-Rico et al., 2020). Other authors, such as Hinojo et al. (2020), point out that the Flipped Classroom fosters interpersonal relationships between teacher-student. Therefore, this type of innovative methodologies should be promoted in today's education. In fact, it is worth noting that students who have a higher level of EI have a higher level of well-being and higher academic performance with respect to the use of ICT. Thus, digitized activities can be planned and implemented more successfully (Jan et al., 2018).

López-Faicán and Jaén (2020), indicate that the use of AR in Primary Education favors socialization, communicative skills and EI, since the game design makes children collaborate in the use of activities and the development of various competencies in a synchronized manner. EI, it should be noted that it constitutes a relevant construct for the student's life, being considered a predictor of academic success and performance

(Mendoza et al., 2019). And, emotions are involved during the student's academic process, both in face-to-face and virtual teaching (Ohuerrou et al., 2019; Okoye et al., 2020), so the first hypothesis is accepted.

Our second specific objective was to analyze the relationship between the use of ICT and motivation in students. In this regard, Chang et al. (2019) and Wei-Kai et al. (2019), indicate after the results of their research that the use of digital resources in education, such as AR, provides the opportunity for students to practice the contents more. This translates into improved retention of conceptual knowledge and, therefore, improved motivation and academic performance. The use of the Internet and social networks also develops students' motivation and academic performance. Since, carrying out activities from these resources allows students to access sources, materials and useful educational content to acquire academic skills and knowledge that contribute to improve their academic interest and grades (Chang et al., 2019), contributing to educational accessibility (Soriano-Sánchez & Jiménez-Vázquez, 2023) and favoring innovation (Soriano-Sánchez & Jiménez-Vázquez, 2022a).

Today's teaching staff still presents certain barriers and/or resistance to the use of ICT in the classroom. For this reason, Sandí (2020) has indicated that in this type of situation, the ideal would be to count on the various educational agents, such as other teachers or administrative staff, so that they can help to promote the acquisition of digital competencies. At the same time, teachers should present a methodology that promotes the various contents related to risk factors in the use of ICTs, so that their use has a pedagogical purpose or for the establishment of good interpersonal relationships. Therefore, the use of the Internet and social networks for social purposes can have a positive effect on the student (Zsido et al., 2020). However, it would be interesting to take into account at all levels, and especially in adolescence, that an excessive use of the cell phone could lead to certain disorders, which would harm the quality of life of the young person and his or her integral development (Soriano-Sánchez, 2022). However, it seems that collaboration in online educational projects and initiatives could be a protective factor, since it helps to address the teacher's barriers related to the use of ICT in the classroom. In this sense, Mengual-Andrés et al. (2020), indicate that when participation is carried out in teaching and learning environments through an e-learning methodology, it provides feedback among its users, by improving attitudes towards learning (Kowitlawakul et al., 2017). This could possibly occur as a result of carrying out more practical, participatory and active work (Mengual-Andrés et al., 2020), thus affirming the second hypothesis put forward in our research.

As for the third and last objective of this research, which was to recognize the influence that motivation has on the academic performance of students, research such as those carried out by Martínez-Sarmiento and Gaeta (2019), Matviichuk et al. (2017) or Reychav et al. (2018), reveal that the use of ICT increases motivation, interest and academic performance of students, thus affirming the third hypothesis.

For our part, it is worth highlighting the relevance of the practical involvement of the teacher to promote the use of ICT at any educational stage. Teachers must be the main agents in possessing media skills, so that they can carry out innovative educational work and thus implement the use of digitized tools. In this way, it would allow students to acquire the necessary skills to cope in today's society, from greater participation and collaboration in each of the subjects. Consequently, the teacher has to respond to the concerns and needs of students, assuming a new educational role, as a guide or learning coach. Since, the teaching of the present is involved in new educational canons, where the teacher has to be a dynamic agent of the teaching-learning process (Mengual-Andrés et al., 2020).

The results obtained allow the different educational institutions and, in particular, teachers, to acquire new knowledge about the use of ICT and their relationship with EI, motivation and academic performance in students. Based on the results presented, it will be possible to develop new methodological practices of teaching innovation that promote participation, cooperation, inclusion, motivation, increased academic performance and the acquisition of new knowledge by students, ensuring their well-being and the quality of teaching.

This study is not without limitations. On the one hand, the selected databases could be found, since PubMed, Web of Science, PsycINFO, Scopus and Dialnet have been used, so it is possible that studies published in other electronic resources may have been omitted unintentionally. On the other hand, another possible limitation could be the lack of longitudinal research design. In this sense, from these, it would be possible to visualize the data found in the different tests by means of the results obtained in the pretest and posttest and, thus, to verify the cause-effect relationship. Likewise, the present study has not been able to obtain empirical evidence related to the objective of this study in relation to the Early Childhood Education stage, which has prevented the presentation of results and conclusions in this direction.

Finally, it is suggested that new empirical research should be carried out to integrate learning methodologies based on the use of digital educational content (due to its positive relationship with motivation and improved academic performance). As well as activities that favor the development of EI, since the latter is a mediating variable for the improvement of school coexistence. In this direction, new possible conclusions about the interrelation of the different variables raised in this research could be obtained.

5. CONCLUSIONS

The results found in the different studies reveal that there is a positive relationship between EI and media competencies. Students who show a higher level in these factors have higher academic achievement. Therefore, it is worth highlighting the importance of EI in the current educational curriculum. In fact, its development can be favored through practice. In particular, empathy, self-motivation and social skills are of great importance in the use of digital competencies. To this end, the introduction of ICT activities and innovative methodologies, such as gamification and the use of AR, could increase students' academic achievement, as they show a greater interest in learning new content.

In short, today's educators should eliminate barriers to the use of ICT and formulate new innovative methodologies created from the digital ecosystem, so that students acquire a new profile, that of a virtual learner. Thus, the use of Apps and social networks should be present throughout the educational process, adapting their use to educational needs through personalized education, responding to the profile of each student and, therefore, favoring the principles of standardization and inclusion to ensure the quality of education through teaching methodologies based on inclunovation, where common education and universal accessibility are guaranteed in the current educational system in each of its stages.

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