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Emotional intelligence, motivation and learning strategies: The SSREI and MSLQ-SF questionnaires

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Abstract

Purpose: The influence of a good management of Emotional Intelligence (EI) on personal attitude shows a motivational impact that allows better results in any field, work, social or personal. This study analyzes EI and Motivation (MO) through the learning strategies present in 402 university students of the Faculty of Economics and Business and the Faculty of Marketing and Management. It also analyzes the impact of gender on these results and identifies the dimensions of the variables studied.

Design/methodology/approach: For this purpose, we applied the motivational tools Motivated Strategies for Learning Questionnaire (MSLQ) and the Self-Report Emotional Intelligence Test (SSEIT).

Findings: Based on the identification of five IE and four MO dimensions, the results of this study indicate high levels of active participation and interest in the subject. Students show a desire to learn effectively and for their learning to be of quality, motivating and useful for understanding the world around them and applying that knowledge to improve it.

In relation to the impact of the gender factor, no significant differences or attitudinal patterns were found. Responses and behaviors were homogeneous for both genders.

Originality/value: This work identifies the dimensions of EI and MO of university students in terms of involvement, interest in the subject of study and use of learning tools. Confirming that these parameters influence academic performance, the results allow us to determine in which aspects it is necessary or advisable to work on. Attitudes, motivation and intelligent emotional management can provide a competitive advantage.

Keywords: Emotional intelligence, Motivation, Learning strategies, Performance

Jel Codes: I23, D91, O33

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1. Introduction

Emotional Intelligence (EI), is the ability to effectively manage one's own and others' emotions, facilitates learning by fostering self-efficacy and emotional resilience, Goleman (1995). On the other hand, Motivation can be understood as "the set of internal and external processes that activate, direct, and sustain behaviors related to learning". Authors such as Ryan and Deci (2000) have explored this idea within the framework of self-determination theory, focusing on internal factors (intrinsic motivation, which arises from genuine interest and personal satisfaction in learning) and external factors (extrinsic motivation, related to external elements such as rewards or recognition) that influence behavior.

In this way, EI, motivation, and learning strategies are interconnected factors that significantly influence academic performance. According to a study by Tang and He (2023), EI positively impacts learning motivation, particularly in high-stress contexts such as the COVID-19 pandemic. Moreover, self-efficacy and social support serve as key mediators in this relationship, enabling students to develop more effective strategies to maintain their engagement with studies.

Additionally, research on hybrid learning environments, which combine in-person and virtual classes, has shown that EI not only enhances study habits but also increases cognitive engagement. This engagement acts as a bridge between EI and learning strategies, helping students better address challenges associated with rapid changes in teaching methods, such as the shift to online learning due to university closures (Iqbal, Asghar, Ashraf & Yi, 2022).

Furthermore, EI has been found to correlate positively with academic performance and students' ability to set clear goals and overcome obstacles. According to an analysis by Chang and Tsai (2022), EI enables students to integrate rationality and emotions, resulting in better academic decision-making and interpersonal relationships. Factors such as self-motivation and emotional regulation directly contribute to the implementation of more effective learning strategies.

These studies emphasize the importance of incorporating EI development into educational programs, not only to improve academic outcomes but also to prepare students for broader emotional and social challenges.

The present research analyses the importance of EI, motivation and learning strategies of students at university level. We also consider whether there are gender differences in this behaviour. Regarding the specific objectives of the study, we examine the degree of intra- and interpersonal EI of these students, in addition to considering their level of motivation in terms of their involvement with, appreciation for and interest in the subject under study. In addition, we aim to identify the dimensions of these two variables, EI and motivation, by carrying out a factor analysis. To this end, we apply the motivation tools Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, 1991), and the Self-Report Emotional Intelligence Test (SSEIT) (Schutte, Malouff, Hall, Haggerty, Cooper, Golden et al., 1998), which was originally carried out with students from the Faculty of Economics and Business Studies and the Faculty of Marketing and Management.

The paper is divided into four parts, firstly, we mention the literature review, in it, the importance of the subject, the contribution of our work and the objectives set in it are reflected, while defining the theoretical framework, where the concept of emotional intelligence, motivation, academic performance and learning are introduced, as well as the different measures of evaluation of these variables. Likewise, we describe how these variables are related within the main existing research in the literature. Secondly, we show the methodology applied, thirdly, we provide the results extracted. Finally, fourthly, we formulate the conclusions and discussion and future lines of research.

In short, in the review of the literature of the last ten years we would like to highlight, on the one hand, the article by Niroomand, Behjat and Rostampour (2014) where they relate EI, the SSREI and MSLQ-SF questionnaires jointly in Iranian students. According to our search in WOS, we found only this research linking the two. Regarding the research by Niroomand et al. (2014), in addition to the relationship of the three concepts, we have provided the possible gender difference among respondents at the University of Malaga (Spain).

On the other hand, we highlight the study of Tejani, Khan, Ejaz and Shamsy (2021) Pakistani students, where a marked gender difference in motivation and learning in motivation and learning strategies. It should be noted that our study is carried out in diverse ethnographic contexts, so we do not intend to make direct comparisons.

The results of this study allow us to answer different questions related to the importance of emotional intelligence, motivation and learning strategies of university students:

What is the level of EI and Motivation (MO) through learning strategies presented by university students? Are there significant differences according to gender? What are the dimensions of the EI and motivation variables?

2. Review of Literature

2.1. Emotional Intelligence

Intelligence refers to intelligence quotient, which is considered to be the universal indicator of an individual (Goleman,1995). Thus, researchers such as Gardner (1983) and Sternberg (1988) have suggested that the term "intrapersonal and interpersonal intelligence" provided a basis for later models of emotional intelligence (EI). These authors suggested that the essence of intrapersonal intelligence is the ability to know one's own emotions, while that of interpersonal intelligence is the ability to understand the emotions and intentions of other individuals (Gignac, Palmer, Manocha & Stough, 2005; Schutte et al. 1998).

Subsequently, Salovey and Mayer (1990) proposed a broader approach to understanding intelligence. They were the first to introduce the term "emotional intelligence", understood as the ability to perceive and express emotion in oneself (via verbal and non-verbal expression) and in others (via non-verbal perception and empathy), as well as to regulate emotion in oneself and in others, and understand how to use that emotion. Thus, some people are better able than others to process information about emotions and to use it to guide their thinking and behaviour.

The concept of EI was gradually introduced into the scientific literature. It was popularised and expanded upon by Goleman (1995), who added a set of communicative and social skills influenced by the understanding and expression of emotions. Later, Bar-On (2000) defined EI as a set of knowledge and skills that affects the emotional and social influences on an individual's ability to be aware. According to Bar-On (2000), these skills are non-cognitive and enable individuals to understand, be aware of, and know how to express and control their emotions in order to increase their success in life. Following introduction of the concept of EI, some studies have interpreted it as a set of mental skills, and others as an eclectic mix of positive traits, such as happiness, self-esteem and optimism (Mayer, Salovey & Caruso, 2008).

Transferring the concept of EI to teaching, research concerning the quality of higher education has increased significantly, as noted by Froiland and Worrell (2016), Mortiboys (2013) and Rao and Sachs (1999). Authors such as Perera and Di Giacomo (2013) have proposed conceptual models that link trait EI directly and indirectly to educational performance in various educational environments. One such environment these authors considered was the university, wherein, at the moment of university transition, students have to face new challenges and experiences at the academic and social levels that can cause stress, at least in the first term of the course.

Thus, higher academic performance is achieved by individuals who possess higher EI, which enables stronger and more enduring interpersonal relationships to form (Brackett, Rivers & Salovey, 2011), thus contributing to higher intellectual development in general (Berndt, 1999, as cited in Altwijri, Alotaibi, Alsaeed, Alsalim, Alatiq, Al-Sarheed et al., 2021; see also Ford & Smith, 2007).

Similarly, in the study carried out by Kasemy, Kabbash, Desouky, Abd-El-Raouf, Aloshari and El-Sheikh (2022) student motivation was the highly significant predictor of academic performance followed by learning, emotional intelligence, and educational environment. Along these lines, in the research carried out by Tejani et al. (2021) with Pakistani students, significant correlations were found between eleven subscales of the MSLQ and the students' academic performance Therefore, motivation has an impact on academic results and a considerable gender difference prevails in terms of motivation. and learning strategies. However, the model fit indices in SEM show a relative fit and poor fit in some of the indices.

For his part, Lei (2024), in his research work with Chinese students enrolled in science, technology, engineering and mathematics programs, in several universities in China, found a significant correlation between self-regulated learning, motivation to learn science and emotional intelligence, and thus, be able to improve academic results. Authors such as Marín-Marín, López-Belmonte, Lampropoulos and Moreno-Guerrero (2023) focused on knowing the impact of a reading plan (understood as a skill in the person) in a control and experimental group with students from different primary schools in Spain, in dimensions such as motivation, emotional intelligence, showing a positive effect in the improvement of these dimensions in the students in the experimental group.

High EI also has a favourable impact on language development (Kourakou, 2018; Rostampour & Niroomand, 2013); specifically, language learning, emotional characteristics and cognitive ability are beneficial for reading comprehension, introspection, speaking and writing (Abdolrezapour & Tavakoli, 2012; Afshar & Rahimi, 2016; Asadollahfam, Salimi & Pashazadeh, 2012; Chang, 2021; Motallebzadeh, 2009). Moreover, as Aki (2006) stated, it is important for language learners to be emotionally intelligent rather than academically intelligent. Similarly, Niroomand et al. (2014) studied the relationship between EI and motivation among Iranian university students, finding that students of English as a foreign language learners plays a significant and determining role in expanding their language skills. However, this is in contrast to studies by Vali-Mohammadi and Bagheri (2011) and Pishghadam (2009), which did not show a positive relationship between the two variables, EI and second language learning as the results were discussed. Along the same lines, the study carried out on high school students by Nieto-Carracedo, Gómez-Iñiguez, Tamayo and Igartua (2024) indicated that emotional intelligence cannot be directly related to academic performance, although it can be related through mediating factors. Indirectly, emotionally intelligent students have higher levels of emotional well-being, which predicts better learning strategies and, in turn, is associated with academic performance. Also, Razavi, Omid, Rezaee and Khalesi (2020) suggested in their research that although there was a significant positive correlation between EI and motivated strategies, there was an insignificant poor correlation between EI and academic performance but a significant positive correlation between motivated strategies.

In this way, it can be said that learning motivation is influenced by students' EI, such that there is a positive relationship between students' learning motivation (Chang & Tsai, 2022), EI (Dubey, 2012), language performance (Henter, 2014) and self-efficacy (Berenson, Boyles & Weaver, 2008; CussóCalabuig, Farran & Bosch-Capblanch, 2018; Nonis & Fenner, 2012; Yokoyama, 2019). Thus, in general, all these variables influence students' academic performance. Similarly, a study by Altwijri et al. (2021) with Saudi Arabian medical students found a positive relationship between EI and academic success and that both are vital for increasing academic performance.

Likewise, some studies have focused on the impact of EI in education and how learning motivation is related to students' EI (Dubey, 2012) and academic performance (Duchatelet & Donche, 2019). Thus, students' learning effectiveness is related to their motivation (Bain, McCallum, Bell, Cochran & Sawyer, 2010). Achieving good learning outcomes is difficult without motivation (Tella, 2007). Therefore, the effectiveness of student learning is related to student motivation (Bain et al., 2010).

2.2. Motivation, Academic Performance and Learning

Numerous definitions related to motivation and its different forms can be found in the literature (e.g., Lepper, 1988; Pintrich & Garcia, 1993; Reeve, 1994; Schunk & Meece, 2006; Williams & Burden, 1999). Our study utilises the definition by Gardner (1985); that is, "motivation is a combination of effort plus the desire to achieve a goal plus favourable attitudes towards the goal to be achieved".

Thus, following Ramírez-Mauleón (2005), Rinuado, Chiecher and Donolo (2003), and Rinuado, de la Barrera and Donolo (2006), when it comes to understanding the academic performance of university students, motivation must be considered as a fundamental element, as it is highly relevant for the implementation of learning strategies (Martínez & Galán, 2000). Oxford (2003) defined learning strategies as "operations employed by the learner to assist in the acquisition, storage, retrieval and use of information, as well as specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective and transferable to new situations".

Jaramillo-Mediavilla, Basantes-Andrade, Cabezas-González and Casillas-Martín (2024) highlight in their systematic review that augmented reality enhances student motivation by making learning experiences more interactive and engaging. Similarly, the study by Amores-Valencia, Burgos and Branch-Bedoya (2022) demonstrates how augmented reality can facilitate active and autonomous learning, particularly in science and mathematics. In line with this, Calleros and Gastelú (2024) suggest that active learning strategies, such as gamification and flipped classes, can make learning research methodology more engaging and participatory. Additionally, Pinto-Santuber, Bravo-Molina, Ortiz-Salgado, Jiménez-Gallegos and Faouzi-Nadim (2023) argue that motivation, self-regulation of learning, and digital competence are key variables influencing academic performance and the willingness to learn in distance education contexts.

Building on these perspectives, Acosta-Mejía, Velandia-Sacristán and Martínez-Álvarez (2022) emphasizes the critical role of teachers' pedagogical strategies in developing competencies for more creative and effective learning. Furthermore, Valenzuela, Miranda-Ossandon, Muñoz, Precht, del Valle and Vergaño-Salazar (2024) explore how teaching practices shape motivation-oriented learning strategies by integrating theories such as Self-Determination and Expectancy-Value. Also, Libao, Sagun, Tamangan, Pattalitan, Dupa and Bautista (2016) analyze how various types of motivation impact academic performance in science learning, highlighting additional factors like self-efficacy and control of learning beliefs that also significantly influence academic outcomes.

On the other hand, Pintrich (2000) defined self-regulated learning as "an active and constructive process by which students set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and by the contextual characteristics of the environment". Thus, when approaching learning, different types of learners may emerge: some will approach learning superficially, some deeply and some strategically (Brown, 2004, as cited in Hasanzadeh & Shahmohamadi, 2011). Students who only memorise and reproduce content learn superficially; those who understand the subject matter and integrate the content and understand it learn deeply; and those who manage their time and work space efficiently, and learn structurally (consequently achieving better results), learn strategically. Furthermore, several studies in the scientific literature have shown the relationship posictive between learning, motivation and teaching (Hall, Sampasivam, Muis & Ranellucci, 2016; Thomas & Muller 2016).

In the particular case of shocking situations such as the COVID-19 pandemic, where online courses had to be taken and adapted to, we note as Chang and Tsai, (2022), in a study of Chinese university students, that students with higher EI are likely to be more motivated to learn. Similarly, during the online courses these students were able to feel the emotions of others, impacting their self-efficacy and indirectly influencing their academic performance.

2.3. Instruments: MSLQ and SSREI

There are various tools for studying motivation and its relationship with learning. For example, Castañeda (2004) and Sabogal, Barraza, Hernández and Zapata (2011) used the Inventory of Learning Styles and Motivational Orientation, which makes it possible to quickly and systematically identify the self-assessments that secondary- and higher-education students make about their learning style and their motivational orientation to study.

Pintrich (1988) applied the MSLQ, which in its original version consisted of 81 items. This questionnaire was later modified (Pintrich & García, 1993), reduced to 40 items, and called the Motivation and Learning Strategies Questionnaire – Short Form (MSLQ-SF). Pintrich and García (1993) wanted to examine the ability of variables related to the use of learning strategies to explain the academic performance of students (Vásquez-Córdova, 2021), and showed that it is a reliable instrument. Roces, Tourón and González-Torres (1995) adapted the questionnaire to the Spanish context under the name Cuestionario de Estrategias de Aprendizaje y Motivación. The instrument has also been used by authors such as Curione and Huertas (2017), Duncan and McKeachie (2005), Dunn, Lo, Mulvenon and Sutcliffe (2012), Hilpert, Stempien, van der Hoeven-Kraft and Husman (2013), Radovan (2010), and Zurita-Ortega, Martinez-Martinez, Chacon-Cuberos and Ubago-Jiménez (2019), among many others.

Both the SSREI (Self-Report Emotional Intelligence) and the MSLQ-SF have been used to investigate how emotional intelligence influences motivation and learning strategies in educational settings. Recent work has

illustrated that EI, measured through tools such as the SSREI, interacts with the MSLQ-SF motivation scales to predict academic outcomes Quílez-Robres, Usán, Lozano-Blasco and Salavera (2023).

In the same way, research such as that of Gomes and Schmidt (2023) shows that EI can enhance the application of learning strategies and improve academic outcomes through tools like SSREI and MSLQ-SF.

3. Methodology

In order to achieve the study objectives, a survey was developed focused on the quantification and systematic review of emotional and motivational traits. Two validated questionnaires were applied. The first was MSLQ-SF (Pintrich, 1991). This questionnaire consists of two parts: (a) motivation, which is further divided into two microvariables, value components and affective components; and (b) learning strategies, which is further divided into the microvariables cognitive and metacognitive strategies, resource management strategies and value components. The second questionnaire was the SSEIT (Schutte et al., 1998), which is based on Salovey and Mayers' (1990) original theory of EI and consists of a 33-item self-report measure of students' EI. The SSEIT items utilise a 5-point Likert scale. Factors identified via the SSEIT include perception of emotions (PE), managing emotions in oneself (MES), managing emotions of others and emotion utilisation (UE).

These questionnaires were answered as mentioned above by students from different branches of the Faculty of Economics and Business Studies and the Faculty of Marketing and Management specified in Table 1. The participating population are students of the Faculty of Economics and Business between 18 and 30 years old. The class was previously informed that we were going to carry out the questionnaire deeply.

A typical quantitative descriptive methodology study was carried out with 402 students (Málaga, Spain), from the aforementioned faculties, based on a survey carried out with their students.

We analysed the results obtained for EI and motivation on the one hand, and motivation on the other. In both cases, Likert-type questionnaires (1 being the minimum score, 5 the maximum) were used. These were created using survey tools used on the university's virtual campus (on line). Prior to answering the questionnaire, students were instructed on the considerations to be taken into account when answering the questionnaire. Data collection was carried out during the first four-month period of the academic year 2021-2022, with the questionnaires closing at the end of the year 2022. The time used to answer the questionnaires was similar for all students (around 35 minutes). Questionnaires were anonymous.

Degree	Frequency	% Total	Accumulated %
Business Administration and Management	113	28.11	28.11
Economics and Business Administration and Management	14	3.48	31.59
Finance, Accounting and Business Administration and Management	135	33.58	65.17
Economics	19	4.73	69.9
Finance and Accounting	100	24.88	94.78
Marketing	21	5.22	100
Total	402	100	100

Table 1. Participants in each university degree

Items	Descriptors
1	I try to change the way I study to meet the requirements of the subject and the teacher's teaching style.
2	Continued weekly readings and assignments for the course
3	In a mid-term exam I think about how poorly I am doing compared to others.
4	I relate what I read for class to what I know.
5	When I study the readings for this subject I underline the material to help me organise my thoughts.
6	Given a theory, interpretation or conclusion I determine its support in evidence (proof, examples).
7	If I am confused about what I read, I go back and try to sort it out

Items	Descriptors
8	I usually study in a place where I can concentrate
9	I work hard academically even if I don't like what I do.
10	I prefer subject material that arouses my curiosity even if it is difficult.
11	I think that the subject material is useful for learning.
12	Before any assessment I think about the consequences of failure
13	When studying, he summarised the main ideas, readings and concepts of the class.
14	When I study for subjects I review readings and class notes looking for main ideas.
15	I try to think through a topic and decide what I am supposed to learn.
16	I am generally interested in the topics of the subjects I am interested in.
17	Before studying new subject material I often review it to see how it is organised.
18	When studying for classes I set goals to direct my activities in each study period.
19	The most satisfying thing for me in this subject is to understand the content as well as possible.
20	I rarely find an hour to review my notes or readings before the exam.
21	I feel an uneasiness that disturbs me when I take an exam.
22	I try to understand the material in this class by making connections between the readings and the concepts given in the class.
23	When I study for the course I review my lecture notes and make an outline of the important concepts.
24	I try to relate my ideas to what I am learning in this subject.
25	When studying for this subject I try to determine which concepts I don't understand well.
26	I find it difficult to adapt to a study Schedule.
27	When course materials are boring and uninteresting, I push myself to finish them.
28	Understanding the subject matter of this course is very important to me.
29	I feel my heart beating fast when I take a test.
30	I try to apply ideas from subject readings in other classroom activities such as presentations and discussions.
31	Whenever I read, hear or hear a statement or conclusion in this class I think of possible alternatives.
32	I question myself to make sure I understood the material I have been studying in this class.
33	I have a regular place to study.
34	In a class I like I prefer subject material that really challenges me so I can learn new things.
35	I am very interested in the area to which this subject belongs.
36	I use the course material as a starting point and try to develop my own ideas on it.
37	If the course materials are difficult to understand change the way you read it.
38	I make good use of my study time for this subject.
39	When the subject work is difficult, I give up and only study the easy stuff.
40	If I take messy notes in class, I make sure to sort them out later.

Table 2. Motivation and Learning Strategies Questionnaire Short Form - MSQF SF. Pintrich (1991)

Using Jamovi we proceeded to calculate the measures of central tendency, mean, mode and median, as well as the standard deviation, skewness and kurtosis for the variable Emotional Intelligence (EI) in all its dimensions these data are analysed in the results section. Also, we have calculated with the same procedure the measures of central tendency, mean, mode and median for the variable Motivation (MO) and all its dimensions, which are analysed in the results section. In both cases we calculated the Shapiro-Wilk test.

The reliability, validity and test-retest reliability of both EI and MO were analysed to determine the possibility of conducting a factor analysis of both categories. Subsequently, an exploratory factor analysis was performed with Varimax principal extraction method using JAMOVI To assess the model fit, the Chi-square indices were used in

relation to their degrees of freedom, RMSEA, SRMR, for both EI and MO TLI and CFI (Kaplan, 2009; Hormigo, 2014; Shi, Maydeu-Olivares & DiStefano, 2018).

Dimension	Items
Assessment of homework	20, 26, 39
Test anxiety	3, 12, 21, 29
Preparation strategies	4,5 22, 24, 25
Organisational strategies	13, 14, 23, 40
Critical thinking	1, 6, 15
Self-regulation of metacognition	16, 30, 31, 32, 34, 35, 36
Study time and habits	2, 18, 17, 18, 33, 38
Self-regulation of effort	7, 9, 11, 17, 19, 27, 28
Intrinsic goal orientation	10, 37

Table 3. Dimensions of Motivation. Pintrich (1991)

Items	Description of dimensions
1	I know when to speak about my personal problems to others.
2	When I am faced with obstacles, I remember times I faced similar obstacles and overcame them
3	I expect that I will do well on most things I try.
4	Other people find it easy to confide in me.
5	I find it hard to understand the non-verbal messages of other people.
6	Some of the major events of my life have led me to re-evaluate what is important and not important.
7	When my mood changes, I see new possibilities.
8	Emotions are one of the things that make my life worth living.
9	I am aware of my emotions as I experience them.
10	I expect good things to happen.
11	I like to share my emotions with others.
12	When I experience a positive emotion, I know how to make it last.
13	I arrange events others enjoy.
14	I seek out activities that make me happy.
15	I am aware of the non-verbal messages I send to others.
16	I present myself in a way that makes a good impression on others.
17	When I am in a positive mood, solving problems is easy for me.
18	By looking at their facial expressions, I recognize the emotions people are experiencing.
19	I know why my emotions change.
20	When I am in a positive mood, I am able to come up with new ideas.
21	I have control over my emotions.
22	I easily recognize my emotions as I experience them.
23	I motivate myself by imagining a good outcome to tasks I take on.
24	I compliment others when they have done something well.
25	I am aware of the non-verbal messages other people send.
26	When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself.
27	When I feel a change in emotions, I tend to come up with new ideas.
28	When I am faced with a challenge, I give up because I believe I will fail.
29	I know what other people are feeling just by looking at them.

Items	Description of dimensions
30	I help other people feel better when they are down.
31	I use good moods to help myself keep trying in the face of obstacles.
32	I can tell how people are feeling by listening to the tone of their voice.
33	It is difficult for me to understand why people feel the way they do.

Table 4. Emotional Intelligence Items. Pintrich (1991)

Dimension	Items
Assessment of my own emotions (self-assessment of my emotions)	9, 22
Valuing emotions in others	5, 15, 18, 25, 29, 32, 33
Emotional expression	1, 11
Emotional self-regulation	2, 3, 12, 14, 23, 28, 31, 10
Emotional regulation of others	4, 13, 16, 24, 30
Using emotions in problem solving	7, 17, 20, 27
Uncategorized	6, 8, 19, 21, 26

Table 5. Dimensions of EI. Schutte et al. (1998)

We first analysed the EI questionnaire and then the motivation questionnaire, and conducted reliability and validity tests in order to verify whether factor analysis was appropriate in both cases. The instrument used to obtain the data was the MSLQ-SF scale of Pintrich (1991) and the SSREI of Schutte (1998), given that the aim was to identify aspects of EI and motivation. Subsequently, exploratory factor analysis was carried out with a varimax principal extraction method using JASP. To assess the model fit, chi-square indices were used in relation to their degrees of freedom, RMSEA, SRMR, TLI and CFI (Hormigo, 2014; Kaplan, 2009; Shi et al., 2018).

4. Results

The results were determined via descriptive statistical analysis of the variables of interest. In parallel, the latent structure of the measurement was confirmed through exploratory factor analysis. We then calculated scores for the participants, according to the scales analysed, by averaging their scores on the items corresponding to these factors. The results obtained made it possible to determine, in a descriptive way, the different response profiles of the respondents, which revealed a range of attitudes with different frequencies.

The Cronbach's alpha score for EI was 0.86, while the McDonald's omega was 0.87, (Table 10 and Table 11). Regarding motivation, the Cronbach's alpha was 0.90 and McDonald's omega was 0.91. Barlett's test of sphericity in both cases yielded a result below 0.001.

Based on the approach outlined above, we considered the EI and motivation for each, such that a series of factors or dimensions were identified and were determined to be consistent with the results gathered in the study. Figure 1 details the dimensions established.

Regarding EI, the factor structure for the analysis was extracted by means of principal component analysis, which involves avoiding any initial conditional claim to achieve a certain number of factors. Both the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO = .778.5) and the result of Bartlett's test of sphericity (Chi-square = 4192; gl = 528; $p < .001$) showed that the statements were intercorrelated and, therefore, that factor analysis was appropriate. Varimax oblique rotation was used, yielding a chi-square ratio/degrees of freedom value of 7.73. This can be considered to indicate acceptable fit, as do the fit indices RMSEA = 0.07 and SRMR = 0.09.

Regarding motivation, the factor structure for the analysis was again extracted by means of principal component analysis. Both the KMO measure of sampling adequacy (KMO = .688) and the result of Bartlett's test of sphericity (Chi-square = 5218; gl = 496; $p < .001$) showed that the statements were intercorrelated and, therefore, that factor analysis was appropriate. Varimax rotation was again used, yielding a chi-square

ratio/degrees of freedom value of 19.97. Again, this indicates acceptable fit, as do the fit indices RMSEA = 0.19 and SRMR = 0.09.

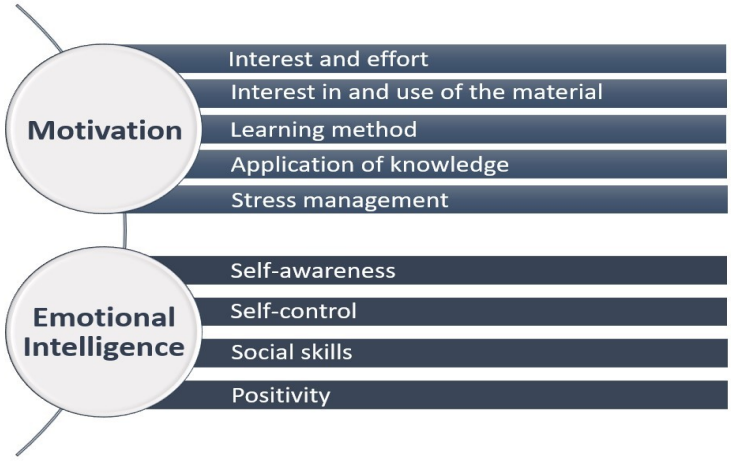

Figure 1. Factors or dimensions of the two study variables: Motivation and Emotional Intelligence

The coding of the factors obtained, as presented in Figure 1, was carried out by taking as a reference their respective weights in the rotated matrix, from which those that reflected a loading greater than 0.30 were selected. These results are as follows.

The component motivation, interest and effort brings together items related to involvement and commitment to the subject. Weights obtained for this factor were as follows: pursuit of academic objectives 0.58, adaptation to the subject 0.72, adaptation to the study method 0.47, interest in the subject 0.53, interest in the area of knowledge 0.45, satisfaction with learning 0.47, personal learning objectives 0.61, effort to go deeper into the content 0.50, revision and review of the subject 0.36, involvement in the subject 0.72, commitment to learning 0.59.

The factor motivation, interest in and use of the material encompasses aspects such as the active and repeated use of materials provided and suggested by the teaching staff or the institution. Weights obtained for this factor were as follows: use of materials 0.50, re-reading 0.39, re-use of material 0.39, evaluation of the usefulness of the material 0.53, continuous work 0.55, elaboration of summaries 0.46, curiosity and self-stimulation 0.63, management of the time necessary for the use or elaboration of the materials 0.42, attitude towards difficulty 0.47.

The dimension motivation learning method comprises indicators connected to the work and approaches carried out to grasp the concepts involved in the subject. Weights obtained for this factor were as follows: previous preparation on the subject 0.36, planning 0.45, relation and connection of ideas 0.74, study methods 0.75, search for concepts that need to be reinforced 0.39, time management 0.68, adaptation of timetables 0.56, self-evaluation 0.60, suitability of study location 0.32, habituality 0.66.

Motivation, application of knowledge includes items related to the usefulness and applicability of the concepts learned. Weights obtained for this factor were as follows: ability to relate some topics to others 0.54, ability to relate to theory and examples 0.53, ability to connect ideas to the subject 0.6, application of ideas and topics learned 0.55, search for alternatives to class statements 0.68, desire to learn 0.55.

Motivation, stress management refers to the influence or control of stress. Weights obtained for this factor were as follows: stress level 0.64, nerves during test-taking 0.53, influence of previous negative experiences 0.6, pessimism and its consequences 0.54.

Within the sub-factors of EI, self-awareness includes components such as emotion management, self-awareness, ways of communicating and personal development. Weights obtained for this factor were as follows: empathy 0.76, importance of emotions 0.38, importance of sharing emotions 0.52, managing positive emotions 0.48, seeking positive emotions 0.62, life experience 0.42, communication and emotions 0.73, attitude to challenges 0.76, why emotional changes 0.57, opportunities 0.44, new perspectives 0.59.

Also a sub-factor of EI, self-control is concerned with self-direction based on self-knowledge, complementing the previous dimension. Weights obtained for this factor were as follows: control of emotions 0.68, self-knowledge 0.60, self-control 0.72, pursuit of happiness 0.44, anchoring in positive experiences 0.44.

EI social skills focuses on the external domain of EI, and deals with elements of communication and relating to others. Weights obtained for this factor were as follows: perception of emotions in verbal language 0.33, perception of emotions in non-verbal language 0.58, immediate perception of others' emotions 0.51, benefit of positive emotions 0.56, transmitting own emotions to others 0.47, transmitting confidence 0.46, use of non-verbal language 0.40, management of personal image 0.65, emotional management of other people individually 0.52., emotional management of other people in groups 0.31.

EI positivity complements the previous factor, and includes items related to subjective positivity in interpersonal relationships. Weights obtained for this factor were as follows: empathy in communication through verbal language 0.48, empathy in communication through non-verbal language 0.60, optimism 0.47, self-confidence 0.63, recognition of others 0.46, self-motivation through optimism 0.44, self-motivation through good humour 0.54.

The analysis shows that, in general terms, the students' own perceptions of the aspects related to their EI and motivation are very positive. This is revealed through the high scores obtained via the self-assessment questionnaires.

These results show a marked asymmetry of distribution towards the right (negative values in the symmetry statistic for 97% of the items; that is, for all except questions M39 and IE 28, which share a distinctive feature that will be explained below). This is perhaps to be expected since the participants were asked to themselves without first working on a marked character of constructive self-criticism in the population observed.

On the other hand, the kurtosis of the data is negative, meaning that the data present less extreme outliers than those with normal distribution. In this sense, the mean may be the most representative statistic for finding a typical sample value.

For the 5-point scales, the mean rating figures were predominantly above 3.5, except for the learning method factor, which was 3.4. Grouping dimensions together, the average for the whole sample was 3.55 for motivation and 3.65 for IE.

Following this same line, the median, with a value of 3.8, shows a concentration of 50% of the answers above that score and a mode set at 4.

Figure 2 depicts a comparison of the factors or dimensions examined and their mean values, which, being very similar, are represented in a radial graph with a stressed scale in the most representative values, so that the greatest differences are highlighted.

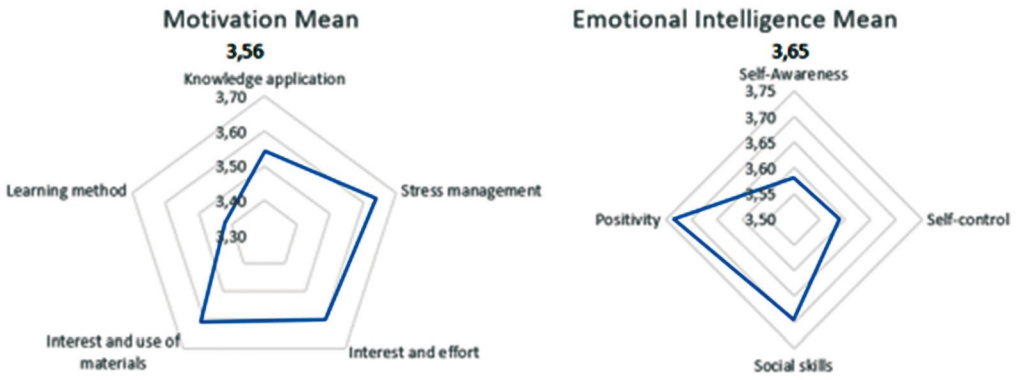

Figure 2. Average score for each of the identified dimensions

The results show that the items with the most room for improvement are those related to two motivation factors, learning method and application of knowledge, and the sub-factors of EI, self-awareness and self-control. However, it should be noted that the lowest mean value is 3.42 for learning methods.

In greater detail, in relation to the variable motivation, the items related to study location (M8: 3.95) and to re-reading class materials (M7: 4.14) have the highest values, while learning method relating and connecting ideas (M23: 3.07) and stimulation through challenges (M39: 2.44) have the lowest.

For EI, the highest means are found for questions related to self-awareness and life experience or the use of positive emotions (EI6: 4.14 and EI20: 3.99); social skills, such as transmitting confidence (EI4: 3.95); and positivity, such as self-confidence and recognition of others (EI3: 3.99 and EI24: 3.96). At the other end of the scale is self-awareness, expressed as a lack of self-confidence (EI28: 2.92).

It should be clarified that the two questions with the worst results (M39: "When the subject is difficult, I give up and only study the easiest aspects" and IE28: "When I face a challenge, I give up because I think I will fail") had a negative framing, so their low scores actually support (and reinforce, if we exclude them, as these were the only items with an average value of less than 3) the conclusions drawn so far regarding concentrated and high self-motivation and EI scores.

As noted above, when commenting on the significant asymmetry observed in the distribution of the data, the behaviour of the responses for questions M39 and IE28 was also intuited in their respective results in the positive statistics of symmetry, showing a behaviour much closer to normal than those recorded for the other questions.

Other measures that provide information for the interpretation of results are the standard deviation and the median, insofar as they allow us to understand the degree of variation and how the results are distributed and, therefore, to estimate their level of approximation to reality.

The standard deviations for the variable motivation range from 0.8 (in indicators of re-reading within the factor labelled interest in and use of material) to 2.9 (relating to the use of outlines and summaries in the learning method factor) although the mean value is 1.08, which is very close to unity. For EI, the analysis is very similar: standard deviations were between 0.87 (in management of positive emotions, within the dimension of self-awareness, IE20, and perception of emotions in verbal language, included in social skills, IE32) and 1.29 (optimism, IE10), with a mean value of 1.04.

Thus, it can be concluded that the percentage of imprecision is relatively high, since it points to a foreseeable divergence in the assessment of the data of slightly more than 25% – a statistic that is expressed in the same units of measurement to which it refers.

However, the range of responses is complete; that is, the minimum and maximum values correspond to the range of the scale proposed. On the other hand, both the mode, set at a value of 4, and also the concentration (also 4) of responses is highly intensive.

Thus, the median only took a value other than 4 in 7 of the 33 IE indicators and 8 of the 40 motivation indicators. In these, the median was 3, except in one case: indicator M39, which has been explained above. Figure 3 shows these indicators.

Figure 3. Median and mean values for indicators with a median other than 4 (grouped by identified factors)

In spite of what has been said above in relation to the interpretation of the standard deviation in terms of the variability in the results, condensing them to high levels, as is the case (around 4), and recalling what has already been said about the strong asymmetry to the right and the scant skewness of the distribution with fairly short tails due to the lower proliferation of outliers, the final results again highlight the high levels of self-assessment collected.

The results of this self-assessment exercise for university students show a very small standard error of the mean (in the order of 0.05) and, based on the arguments above, the responses collected should be interpreted as fairly representative of reality.

5. Discussion

In a context of dizzying technological progress, people can play a crucial role as a link to reality and competent relational management that can be a key differentiating variable between companies. Attitudes, motivational skills and emotionally intelligent management can cumulatively make a competitive difference.

Research supports the crucial role of emotional intelligence (EI) in academic success, both directly and indirectly. Salovey and Mayer (1990) defined EI as the ability to manage one's own and others' emotions, positively influencing emotional well-being and interpersonal relationships. This aligns with studies like those of Nieto-Carracedo et al. (2024), which noted that while EI does not directly affect academic performance, it does play a key role in fostering effective learning strategies and emotional stability.

Specifically, students with higher EI levels exhibit better stress regulation and a greater ability to establish strong interpersonal relationships (Brackett et al., 2011). This creates a favorable environment for acquiring knowledge and skills, enhancing their performance in demanding academic activities.

Furthermore, studies such as those by Dubey (2012) and Altwijri et al. (2021) reinforce the connection between high EI and effective, motivated learning. Research by Razavi et al. (2020) suggests that, although the correlation between EI and academic performance may be weak, it strengthens when motivated learning strategies are considered.

On the other hand, motivation, defined by Gardner (1985) as sustained effort accompanied by a favorable attitude toward achievement, emerges as a fundamental factor in academic performance. This concept is deeply connected to EI, as emotionally intelligent students are more likely to develop intrinsic motivation (Chang & Tsai, 2022), driving them to overcome challenges and remain focused on their goals.

Recent studies, like that of Tejani et al. (2021), have found that motivation is a significant predictor of academic performance, also highlighting gender differences in this area. Although no notable variations were identified between male and female students in this study, these findings emphasize the need for further investigation into how gender, motivation, and EI interact across different cultural contexts.

Additionally, research by Bain et al. (2010) and Tella (2007) asserts that achieving favorable learning outcomes is almost impossible without adequate motivation, reinforcing the idea that it must be cultivated alongside other competencies such as EI and learning strategies.

Same way, learning strategies, defined by Oxford (2003) as actions that facilitate the acquisition and use of information, are closely linked to both motivation and EI. Emotionally intelligent students not only manage their emotions better but also apply more effective strategies, such as deep and structured learning (Hasanzadeh & Shahmohamadi, 2011).

So, the interest in the subject is due to the influence of IE, motivation and learning strategies on academic performance (Altwijir et al., 2021). Emotional intelligence and motivation are two factors that can influence a student's academic performance. Students who develop strong emotional skills tend to have better management of academic pressures, greater intrinsic motivation and interpersonal skills that contribute to a positive learning environment, thus improving their overall academic performance.

The literature has revealed directly positive relationships between professional and personal success and the development of skills in the management of emotions (own and third party; individual and collective) and in anchors with motivational effectiveness (self-motivational, suggestive or inspirational).

This study considers these aspects and examines the level of Emotional Intelligence (both intrapersonal and interpersonal) of university students, their motivation in terms of commitment, valuing and interest in their subject, as well as their learning strategies. The results of this study suggest that respondents had high levels of active participation and interest in the subject. They also displayed a desire to learn more and more effectively, and for this learning to be high-quality, motivating, useful for understanding the world around them and applicable to multiple areas.

After confirming the adequacy of the factor analysis, five dimensions are identified for the MO variable (Interest and Effort, Interest and Use of Material, Learning Method, Knowledge Application and Stress Management) and four dimensions for EI (Self-Awareness, Self-Control, Social Skills and Positivity).

Such commitment, at both individual and collective levels, is based on a developing EI, while being aware of its potential and effects. This represents a powerful tool in individuals' relationships, in their personal and professional growth and in their self-motivation.

Regarding the impact of gender, no differences or attitudinal traits were found that merit special mention, as homogeneous responses and behaviour were observed.

6. Conclusions

This study reinforces the importance of Emotional Intelligence (EI) and motivation as fundamental pillars in students' academic performance and personal development. The integration of innovative pedagogical strategies and the use of more objective evaluation methodologies represent significant opportunities to improve educational outcomes and contribute to the holistic growth of students. EI and motivation are not only determinants of academic success but also essential in building emotionally resilient individuals who are motivated to face the challenges of an ever-changing world.

Finally, our study suggests new lines of research as an opportunity to extend the results, as follows.

On the one hand, it is concluded that in the aspects related to self-motivation to work and take advantage of the subject and self-assessment of specific EI competences, the respondents showed a clear tendency to give themselves medium to high self-assessments, showing relatively high self-confidence and security. However, we were not able to contrast such data against others. Thus, as a possible future line of improvement, we suggest the implementation of measures to mitigate the subjectivity of the evaluations. This can be achieved, for example, by

changing the order of the questions, assessing other colleagues in respondents' circle of influence, or designing scenarios that make it possible to assess decision-making or to detect attitudes and behaviours in specific cases.

On the other hand, we advise future studies to use a sample size that allows for the greatest possible representativeness, not so much in terms of quantity but rather in terms of the quality of the information obtained. In this sense, opening up the range of subjects, and even utilising samples from different universities, could minimise any endogenous or local bias.

Finally, it would be interesting to analyze the influence of motivation and EI on academic performance, so that, by identifying their impact, appropriate teaching methodologies can be designed to develop those dimensions that may be significantly involved. In this context, pedagogical innovations like augmented reality (Jaramillo-Mediavilla et al., 2024) and active strategies such as gamification (Calleros & Gastelú, 2024) have proven to be effective tools for boosting motivation and enhancing learning quality.

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