



Research article



Impact of emotional intelligence and academic self-concept on the academic performance of educational sciences undergraduates

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ABSTRACT

Over the last few years, the inclusion of psychosocial factors in the teaching and learning processes has become increasingly important due to their proven influence on students' academic performance, especially at the university stage. In this regard, the aim of this study is to analyse the impact of emotional intelligence and academic self-concept on the students' academic achievement. The results obtained revealed some differences according to gender in all the variables considered. Specifically, women presented higher levels of emotional attention, academic self-concept and performance, while men stood out in emotional clarity and emotional repair. The findings obtained show the importance of including psychosocial factors in university training plans.

1. Introduction

Emotionally intelligent people are associated in different scientific fields with higher performance at the workplace [1–3] and have better health outcomes and general well-being [4,5]. There are several models for studying intelligence, one of the most studied being the one proposed by Salovey and Mayer [6]. These two authors [6] define emotional intelligence as an ability to generate feelings, understand emotions and regulate them. This study model [6] affirms that emotional intelligence is composed of three fundamental variables: perception, clarity and repair. Emotional perception (EP) refers to the identification, appraisal and expression of emotional state [6]. Emotional clarity (EC) represents how an emotion prioritises thinking and directs cognitive behaviours [6]. Emotional repair (ER) relates to the mitigation of negative emotions and the fostering of positive emotions. The combination of these three elements makes the person capable of managing the effects of emotional states [6].

The educational community considers that emotional intelligence (EI) is associated with better performance in different areas [5]. Because of this, efforts are made in the educational field to provide students with opportunities to develop and enhance it [7]. There is meta-analytical evidence that shows how programmes based on emotional development at school are effective [8,9] and that relational skills are predictors of academic performance [10].

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2. Emotional intelligence and academic performance

Emotional intelligence is related to self-knowledge [10]. This is because each subject must know his or her own emotional needs in order to satisfy them [10]. Emotional intelligence can be learned, improved and/or enhanced. Also, since emotional intelligence is related to the self-control a person has over his or her own emotions, it directly and indirectly influences his or her actions and reactions in the environment in which he or she lives. This self-control directly and indirectly influences the actions of the subject and his or her environment. It is important that its teaching is conceptualised as a permanent and continuous educational process. The educational aims are to enhance the development of emotional competences as an essential element of human development and to increase personal and social well-being [7].

The influence of EI on academic performance has been proven over the last few years [7]. To this end, there have been multiple studies based on emotional intelligence and social learning programmes [11], whose impact has extended beyond the field of education. Most of these programmes were geared towards increasing academic performance [11,12]. These programmes have been aimed at strengthening the emotional aspects of students as a guarantor of achieving greater psycho-emotional balance, which allows them to allocate the necessary resources to start self-regulation processes that improve their learning [13,14].

Among other issues, it has been shown that students with higher levels of emotional intelligence have more resources and strategies for coping with stressful situations [15,16]. These tools allow them to draw up a sequenced action plan that generally tends to yield better results. In this regard, authors such as García Martínez et al. [16] have suggested that emotional intelligence educational programmes which are sequenced and provide space and time for reflection and appropriation of learning are more effective than those that do not encourage self-regulation. In this setting, EI and academic performance are closely linked, especially if learning situations are created in which the teacher plays a key role in the design and implementation of instructional processes.

Beyond the individual differences that may exist among students, determined by other factors such as personality or cognitive skills, emotional intelligence is a factor that directly and indirectly influences the students' academic performance in Higher Education [17]. It should be noted that many of these programmes have been criticised for methodological issues. The typology of instruments used, the wide variety of measures taken and the lack of structure and clarity in the content of the interventions developed should be highlighted [18].

3. Academic self-concept and performance

Self-concept is another variable that has also been related to students' academic performance [19]. Self-concept as a multidimensional variable includes different individual characteristics. Following García and Musitu [20], academic, emotional, family, social and physical self-concept are differentiated. In this research, the focus is on the first one, due to its close link with students' performance. This is supported by many studies that have highlighted a direct relationship between academic self-concept and student performance [21–23]. These studies have argued that students who have high levels of self-concept tend to achieve better academic results, compared to those who have a lower academic self-concept [21–23]. This is not surprising if we consider that self-concept is directly linked to a person's psychosocial balance [20]. The more a person has higher levels of psychophysical stability, the more cognitive and emotional resources he or she can allocate to the different tasks ahead of him or her. This leads to greater performance in these tasks [22,23]. In this line, self-concept has been analysed jointly with other variables such as motivation, self-efficacy or self-esteem in the examination of students' academic performance. In this regard, there are meta-analytic studies such as that of Korpershoek et al. [24], who examined the impact of belonging on motivational, psychosocial and academic performance factors. They found that this feeling of belonging was positively related to performance and moderately related to self-concept and self-efficacy, as well as engagement [24]. Similarly, studies focusing on academic failure have suggested that academic self-concept acts as a shield against failure in school [25,26]. At the same time, it is also necessary to point out the broad presence that self-concept has had in several studies in Higher Education. In this academic field, the relationship between students' self-concept and academic performance has been examined [14,19,27].

For all of the above reasons, this research focuses on the study of psychosocial factors (emotional intelligence and self-concept), which are strongly rooted in the educational environment, in order to analyse the impact of these variables on the academic performance of university students.

Regarding the latter, it can be defined in multiple ways, depending on where the attention is focused. In general terms, performance can be identified with the learning gains that students make because of the instructional processes. Similarly, it can also be identified with the grade obtained by the student. Although the latter implies a biased conceptualisation of performance by overlooking important issues such as learning styles and rhythms or students' own abilities.

4. Academic performance and psychological variables

Dealing with negative emotional situations is key to good academic performance [28]. It has been reported that the negative emotional states most commonly experienced by university students are anxiety and stress [28]. These negative emotions show a negative effect on the different executive functions that favour concentration and psychosocial and physiological functioning in the face of adaptive functions [28]. In addition, problems of anxiety and stress related to the quality of sleep of university students have been observed [29].

Adequate emotional competence helps prevent the development of anxiety and stress [29]. Fostering emotional competence has been found to support the development of resilience strategies that help prevent the onset of anxiety and stress [28]. From the earliest

stages of school, classes aimed at the development and promotion of emotional intelligence are being taught [30]. This is done in order to equip young people with sufficient strategies to avoid the fostering of anxiety and stress exerted by the academic environment [30] and to prevent academic performance from being affected [29]. The meta-analysis study by Sánchez-Álvarez et al. [30] found a moderate association between emotional intelligence and academic performance.

5. Material and methods

5.1. Sample

The sample is made up of a total of 932 participants (20.56 ± 3.661). In terms of gender distribution, 68.3 % ($n = 637$) were female, while 31.7 % ($n = 295$) were males. This proportion is in line with the education careers in Spain. All participants volunteered to participate, giving their written informed consent. Prior to this, participants were informed of the objectives and nature of the study. With respect to sampling error, a 95 % confidence interval was established, obtaining a sampling error of 0.058. The only inclusion criterion was that participants had to be studying a degree related to education sciences (elementary education, early childhood education, pedagogy and social education).

5.2. Instruments

Ad hoc socio-demographic questionnaire: This was intended for the collection of socio-demographic and academic variables. In this case, for the first type of variables, the variables of gender (male/female) and age were collected. To collect the academic variables, the criteria established by the Spanish education system [31] were followed, classifying them as follows: Outstanding (the grade is between 9 and 10), remarkable (the grade is between 7 and 8.99) and pass (the grade is between 5 and 6.99).

Self-Concept Questionnaire Form 5: This instrument was used to collect the academic self-concept variable. It has been developed and validated by García and Musitu [20], which shows a high degree of reliability for each of its dimensions [32]. This questionnaire offers a five-dimensional perspective of self-concept, which is assessed through a Likert scale (1 = never and 5 = always). The dimensions it measures are as follows: Academic Self-Concept (items 1, 6, 11, 16, 21, 26), Social Self-Concept (items 2, 7, 12, 17, 22, 27), Emotional Self-Concept (items 3, 8, 13, 18, 23, 28) and Physical Self-Concept (items 5, 10, 15, 20, 25, 30). In this instance, Cronbach's alpha for academic self-concept obtained a value of $\alpha = 0.825$.

Trait Meta Mood Scale (TMMS-24): It was proposed by Salovey et al. [33]. For this study, the version adapted to Spanish was employed [34]. This questionnaire is made up of a total of 24 items, which are evaluated on a Likert scale (1 = "disagree" 5 = "completely agree"). The first eight items are summed to obtain a score for emotional attention (EA). The sum of the next eight items is used to assess emotional clarity (EC) and finally, the sum of the final eight items reflects emotional repair (ER). In this case for EC, Cronbach's alpha obtained a value of $\alpha = 0.901$, for EC $\alpha = 0.854$ and for ER $\alpha = 0.811$.

5.3. Procedure

Prior to carrying out the study, the research problem was defined. For this purpose, current bibliography was consulted in different databases, mainly in Web of Science, Scopus and Pubmed. Once these steps had been carried out, the Department of Didactics of Musical, Plastic and Corporal Expression of the University of Granada created a Google Form with the instruments. In this instance, we used the online method to collect the data, as it had a greater scope to obtain a larger number of people. A total of 32 questionnaires were removed in this case, as these people did not meet the proposed inclusion criterion. In addition, different social networks were used to promote the study. It should be noted that the objectives of the study were specified and participants were asked for written informed consent. To ensure that responses were not randomly assigned, two questions were duplicated. If these responses did not match, all responses from those participants were removed. As a result, a total of 14 questionnaires were discarded. The research was approved by the Ethics Committee of the University of Granada with code 3132/CEIH/2023.

5.4. Data analysis

For the comparative analysis of the results, the IBM SPSS Statics 25.0 programme (IBM Corp, Armonk, NY, USA) was used. First, the distribution of the sample was studied according to the Kolmogorov-Smirnov test. After verifying that the data followed a normal distribution, the T Student test for independent samples was used. Statistically significant differences were established using Pearson's chi-square test, with the significance level set at 95 %. For the study of the effect size (ES), Cohen's standardised d [35] was used. It was interpreted through the following classification: null (0.0–0.19), small (0.20–0.49), medium (0.50–0.79) and large (≥ 0.80). A cross-tabulation study was then carried out, and statistically significant differences were established at $p < 0.05$.

IBM SPSS Amos 26.0 software (IBM Corp., Armonk, NY, USA) was used to develop the structural equation models. In this study, two models were developed according to the gender of the participants. Each of the models is made up of five variables. Two of them act as endogenous variables while three play the role of exogenous variables. For the endogenous variables, causal explanations were made based on the associations obtained between the indicators and the degree of reliability of the measurement. Regarding the direction of the arrows, the unidirectional arrows show the lines of influence between the latent variables, interpreted as multivariate regression coefficients. For the study of statistically significant differences, the Pearson Chi-Square test was used, establishing two levels of significance, one for $p < 0.05$ and another for $p < 0.001$.

To assess the fit of the models, the recommendations established and proposed by Kline [36] and Kyriazos [37] were followed (Fig. 1). Considering these characteristics, the goodness-of-fit index should be evaluated according to the value obtained in the Chi-Square test, with non-significant values showing a good fit. For the comparative fit index (CFI), goodness-of-fit index (GFI) and incremental reliability index (IFI), the values should be greater than 0.900. Finally, for the root mean square approximation (RMSEA), the values should be less than 0.100.

6. Results

Table 1 shows the results obtained for the comparative analysis. It can be observed that females show higher scores in emotional attention and academic self-concept than males (4.000 ± 0.712 vs 3.786 ± 0.745 ; $p < 0.05$ and 3.776 ± 0.691 vs 3.624 ± 0.629 ; $p < 0.05$, respectively). On the other hand, males score higher than females on emotional clarity and emotional repair (3.522 ± 0.814 vs 3.667 ± 0.729 ; $p < 0.05$ and 3.577 ± 0.811 vs 3.729 ± 0.721 ; $p < 0.05$, respectively).

Statistically significant differences were observed ($p < 0.05$) in the variables, mean score and gender (Table 2). More than two thirds of females (66.9 %) had an average rating of remarkable. Similarly, about two thirds of males obtain an average rating of remarkable (60.0 %).

The model proposed for the male population obtained a good fit for each of the different indices of which it is composed. The Chi-Square test obtained a significant value ($X^2 = 0.256$; $df = 1$; $pl = 0.613$). The data obtained above cannot be interpreted in an independent way due to the susceptibility and size of the sample [38], so it was therefore decided to study other fit indices such as the Tucker Lewis Index (TLI) and the Normalised Fit Index (NFI). Values of 0.999, 0.998, 0.995, 0.905 and 0.925 were obtained for the CFI, NFI, IFI and TLI, respectively, while a value of 0.015 was obtained for the Root Mean Square Approximation (RMSEA).

Table 3 and Fig. 2 show the results obtained for males when adopting the proposed model. It is observed that academic self-concept (AC-SC) receives a positive effect of emotional clarity (EC) ($\beta = 0.219$; $p < 0.05$) and emotional repair (ER) ($\beta = 0.039$; $p = 0.533$). Despite this, academic self-concept (AC-SC) receives a negative effect of emotional attention ($\beta = -0.067$; $p = 0.275$). Regarding average mark (AM) it receives a positive effect of emotional attention (EA) ($\beta = 0.097$; $p = 0.088$), emotional repair (ER) ($\beta = 0.047$; $p = 0.097$) and academic self-concept (AC-SC) ($\beta = 0.226$; $p < 0.001$). Regarding the mutual effects between the variables that make up emotional intelligence, these are positive. Emotional clarity (EC) receives and exerts a positive effect of emotional attention (EA) ($\beta = 0.378$; $p < 0.001$) and emotional repair (ER) ($\beta = 0.438$; $p < 0.001$). Finally, emotional attention (EA) exerts and receives a positive effect on emotional repair (ER) ($\beta = 0.109$; $p = 0.063$).

Following with the model developed for female, it obtained a good fit for each of its different indices. In this case, the Chi-Square test obtained a significant value ($X^2 = 1.570$; $df = 1$; $pl = 0.210$). The CFI, NFI, IFI and TLI obtained values of 0.998, 0.995, 0.998, 0.985 and 0.980 respectively, while for the Root Mean Square Approximation (RMSEA), a value of 0.029 was obtained.

Table 4 and Fig. 3 demonstrate the results obtained for the proposed model for females. The model shows a positive effect on academic self-concept (AC-SC) of emotional attention (EA) ($\beta = 0.036$; $p = 0.377$), emotional repair (ER) ($\beta = 0.067$; $p = 0.377$) and emotional clarity (EC) ($\beta = 0.112$; $p < 0.05$). The effect that average mark (AM) receives is positive for emotional attention (EA) ($\beta = 0.047$; $p = 0.223$) and academic self-concept (AC-SC) ($\beta = 0.276$; $p < 0.001$). A negative effect of emotional repair (ER) on average mark (AM) ($\beta = -0.026$; $p = 0.508$) is observed. Regarding the reciprocal effects of the variables that make up emotional intelligence, these are positive and significant among themselves. Emotional clarity (EC) exerts a positive reciprocal effect with emotional attention (EA) ($\beta = 0.311$; $p < 0.001$) and emotional repair (ER) ($\beta = 0.470$; $p < 0.001$). In addition, a positive reciprocal effect of emotional attention (EA) and emotional repair (ER) is observed ($\beta = 0.144$; $p < 0.001$).

7. Discussion

The aim of this research was to analyse the impact of emotional intelligence and academic self-concept on the university students' academic performance according to gender. The findings are consistent with previous studies [39,40]. Females scored higher on

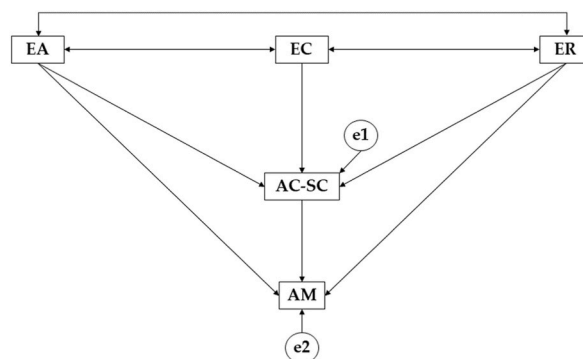


Fig. 1. Proposed theoretical model

Note: Emotional Attention (EA); Emotional Clarity (EC); Emotional Repair (ER); Academic Self-Concept (AC-SC); Average Mark (AM)..

Table 1
Comparative study of variables according to gender.

		Levene Test			T-test			ES (d)	95 % CI		
		N	M	SD	F	Sig.	T	gl	P		
EA	Female	637	4.000	0.712	0.649	0.421	4.209	549.96	<0.05	0.296	[0.157; 0.435]
	Male	295	3.786	0.745							
EC	Female	637	3.522	0.814	4.468	0.035	-2.611	634.12	<0.05	0.184	[0.046; 0.322]
	Male	295	3.667	0.729							
ER	Female	637	3.577	0.811	5.110	0.024	-2.750	638.14	<0.05	0.194	[0.056; 0.332]
	Male	295	3.729	0.721							
AC-SC	Female	637	3.776	0.691	1.300	0.254	3.219	624.62	<0.05	0.226	[0.088; 0.365]
	Male	295	3.624	0.629							

Note: Emotional Attention (EA); Emotional Clarity (EC); Emotional Repair (ER); Academic Self-Concept (AC-SC).

Table 2
Comparative study of the variables gender and academic performance.

		Pass	Remarkable	Outstanding
Female	Total	125	426	86
	% within Gender	19.6 %	66.9 %	13.5 %
	% within Remark	61.0 %	70.6 %	69.4 %
Male	Total	80	177	38
	% within Gender	27.1 %	60.0 %	12.9 %
	% within Remark	39.0 %	29.4 %	30.6 %

Table 3
Results of the proposed theoretical model for males.

Associations between variables	R.W.				S.R.W.
	Estimations	S.E.	C.R.	P	Estimations
AC-SC ← EC	0.189	0.059	3.219	**	0.219
AC-SC ← EA	-0.057	0.052	-1.092	0.275	-0.067
AC-SC ← ER	0.034	0.055	0.623	0.533	0.039
AM ← AC-SC	0.222	0.056	3.978	***	0.226
AM ← EA	0.080	0.047	1.709	0.088	0.097
AM ← ER	0.040	0.049	0.829	0.407	0.047
EC ← → EA	0.205	0.034	6.062	***	0.378
EC ← → ER	0.230	0.033	6.880	***	0.438
EA ← → ER	0.059	0.031	1.861	0.063	0.109

Note: ** $p < 0.05$; *** $p < 0.001$.

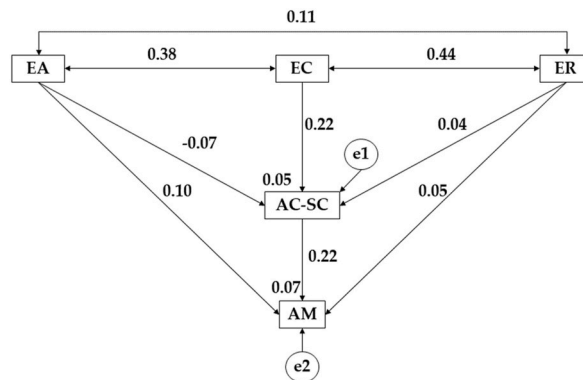


Fig. 2. Effects of model variables in males.

academic self-concept, in line with previous studies such as the one developed by García-Martínez et al. [41], although no significance was reported in the results. At the same time, this finding differs from other studies such as the one developed by Onetti et al. [42], where they found no significant differences in academic self-concept according to gender, although they did find significant differences

Table 4
Results of the proposed theoretical model for females.

Associations between variables	R.W.				S.R.W.
	Estimations	S.E.	C.R.	P	Estimations
AC-SC ←EA	0.035	0.040	0.884	0.377	0.036
AC-SC ←ER	0.057	0.038	1.523	0.128	0.067
AC-SC ← EC	0.095	0.039	2.420	**	0.112
AM ←EA	0.038	0.031	1.219	0.223	0.047
AM ←ER	-0.018	0.027	-0.663	0.508	-0.026
AM ←AC-SC	0.229	0.032	7.191	***	0.276
EC ←→EA	0.181	0.024	7.499	***	0.311
EC ←→ER	0.310	0.029	10.727	***	0.470
EA ←→ER	0.083	0.023	3.596	***	0.144

Note: ** $p < 0.05$; *** $p < 0.001$.

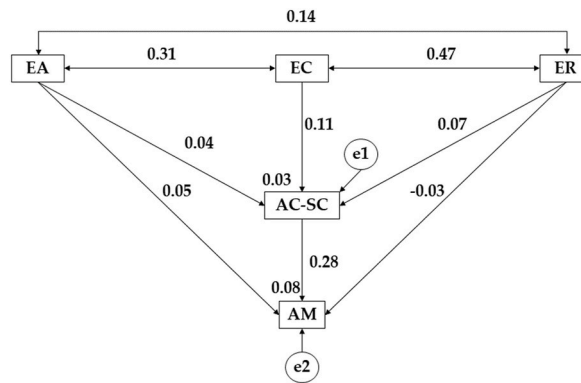


Fig. 3. Effects of model variables in females.

in the emotional dimension, in favour of females. Likewise, considering the relationship already established in the literature, where the connection between academic self-concept and student performance has been identified [43,44], in the present study, females also obtained a higher performance. Males scored higher on emotional clarity and emotional repair than females. These findings are consistent with the research conducted by Moral-Castro and Pérez-Dueñas [45] where young adults scored higher on emotional repair or the study carried out by Calero et al. [46] with Argentinean adolescents. In contrast, other studies have found no differences in these dimensions of EI according to gender [47] or have obtained the opposite results [48].

About the differences found according to gender, a negative effect of emotional attention on academic self-concept is observed for females. A negative effect of emotional repair on the average mark is also observed for the female population. Very different results have been found in other studies, as it has been shown that females shows greater attention to emotions [49]. Female participants have been found to make greater use of emotional regulation to alleviate cortisol levels in negative emotional situations [50]. This emotional regulation leads to higher academic achievement due to greater competence in managing negative emotional states [51]. Males have a lower level of anxiety and stress due to the segregation of neurotransmitters generated during physical activity [52].

8. Limitations and future perspectives

The research presented here shows several limitations that are worth noting. As it is a cross-sectional study, the effects of the variables have only been studied at one point in time. For future research it would be advisable to apply a longitudinal design. This would allow the effects to be studied at several time points. Although the sample is representative, it belongs to a very specific geographical area. This does not allow generalisations to be made for Spain as a whole. For future studies it would be advisable to extend the sample to other geographical areas. The instruments used have been validated and adapted to the population under study. Despite this, they show an intrinsic error related to the measurement process.

As strengths, it should be noted that this study has used reliable instruments. Likewise, the statistical analyses used have been supported by authors who are specialists in these areas. In addition, the sample reached is representative of the population under study.

9. Conclusions

The aim of this research was to analyse the impact of emotional intelligence and academic self-concept on the university students' academic performance according to gender. It is observed that female participants show higher scores on emotional attention and academic self-concept. In contrast, male subjects score higher on emotional clarity and emotional repair. With regard to academic

performance, it is observed that the number of participants with outstanding academic performance are the female participants.

Regarding the gender differences found in the structural equation models, it is observed that for males there is a negative effect of emotional attention on academic self-concept. On the contrary, for the female population there is a negative effect of emotional repairation on the average grade.

Finally, the effects between the variables vary according to the gender of the participants. It can be affirmed that gender acts as a moderator of different aspects of emotional intelligence and academic self-concept.

Data availability statement

Data will be made available on request.

CRediT authorship contribution statement

Jose Luis Ubago-Jimenez: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Formal analysis, Data curation, Conceptualization. **Felix Zurita Ortega:** Writing – review & editing, Writing – original draft, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Jose Luis Ortega-Martin:** Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Conceptualization. **Eduardo Melguizo-Ibanez:** Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Jose Luis Ubago-Jimenez reports financial support was provided by University of Granada. Jose Luis Ubago Jimenez reports a relationship with University of Granada that includes: employment. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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