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ORIGINAL ARTICLE

The emotional intelligence level and its relation with problem-solving for a sample of students at the institute of sciences and techniques of physical and sport activities at the University of Biskra

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ABSTRACT

This study aims at determining the level of emotional intelligence and of the ability to solve problems, and their relation for a sample of students at ISTPSA at the University of Biskra. The authors used the correlational descriptive and the comparative descriptive methods. In addition, they applied emotional intelligence and problem-solving scales on a simple sample of sixty-four students. Findings show that the informants' emotional intelligence is low unlike the problem-solving skills that are high. Besides, there is an average positive statistical relation between emotional intelligence and problem-solving. Finally, there are no statistically significant differences regarding emotional intelligence and the problem solving due to the educational level.

Keywords: Sport health, Emotional intelligence, Problem-solving, Correlational descriptive method, University students, Educational level.

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INTRODUCTION

The modern life is complicated and involves lot of problems due to the fast changes in the social, economic, political, and technological fields. This pushes the human to worry about how to face problems and adapt with the life circumstances with no harm to his mental, psychological, and physical health. In this regard, the ability to solve problems is crucial now. It does not require huge amount of information as much as it requires knowledge about how to employ information (Mohamed, 2009, p. 109). Acquiring this skill highly depends on our reactions towards the problem and on feeling its negative effects, what pushes us to take the decision of facing the problem to end its negative effects and reach balance.

The modern educational approaches adopt problem-solving methods to train students on facing the problems regardless their complexity and vagueness, using the mental and emotional skills together. In this regard, the traditional vision states that the high level of mental intelligence allows finding solutions to life problems. However, this premise was refuted by the modern studies on the emotional intelligence, as scholars noticed that the mental intelligence is, despite its positive effect on the academic achievement, not enough for success in the different life situations because we find academically successful people with difficulties in adapting with life problems and needs(Khidr, 2009, p. 14).

The psychological state helps overcome problems because the over-anxiety, depression, and haste deconcentrate the human and disorient his ability to solve the problem (Benzine, 2013, p. 68) In addition, the readiness, the mental state, and the motivation contribute to problem-solving, as they foster the suitable response and mobilize the previous knowledge and experiences. The emotional intelligence is key for success in life, since it helps understand the self-emotions and the others' to better direct the thinking and behavior. It is one of the factors that help achieve the psychological and life balance, as people with emotional intelligence target going along well with themselves and with the others, and set other goals in life (Meshakba, 2014, p. 85).

The university life is an interactive environment with different characteristics; therefore, it requires students to show emotional intelligence and problem-solving skills to adapt with the circumstances and challenges and gain experience, confidence, and ability to build successful relations. Based on what was said, we shall study these two variables for the students of ISTPSA at the University of Biskra. In so doing, some questions arise, as follows:

- What is the emotional intelligence level of the students of ISTPSA at the University of Biskra?
- What is the problem-solving level of the students of ISTPSA at the University of Biskra?
- Are there statistically significant differences regarding the emotional intelligence level due to the educational level for of the students of ISTPSA at the University of Biskra?
- Are there statistically significant differences regarding the problem-solving skills due to the educational level for the students of ISTPSA at the University of Biskra?
- Is there a statistically significant relation between the emotional intelligence and the problem-solving for the students of ISTPSA at the University of Biskra?

Study hypotheses

- The emotional intelligence level of the students of ISTPSA at the University of Biskra is low.
- The problem-solving level of the students of ISTPSA at the University of Biskra is high.
- There are no statistically significant differences regarding the emotional intelligence level due to the educational level for the students of ISTPSA at the University of Biskra.

- There are no statistically significant differences regarding the problem-solving skills due to the educational level for the students of ISTPSA at the University of Biskra.
- There is a statistically significant relation between emotional intelligence and problem-solving for the students of ISTPSA at the University of Biskra.

Importance of studying

Since the human is one unit made up of mental, psychological, and physical inseparable systems, the positive psychological aspects, including the motivation, excitement, reassurance, and emotional steadiness, and the mental aspects including the intelligence, thinking abilities, comprehension, and cognition make the individual in harmony with himself and the others. In this regard, he can achieve success based on emotional intelligence experiences and problem-solving using rationality, motivation, emotional steadiness, and efficiency, regardless of the complexity of the problem.

Identifying the concepts and terms

Definition of emotional intelligence

It is the ability to pay attention and understand, formulate, and organize the self-emotions and feelings based on an exact understanding of the others' emotions and feelings to build positive social emotional relations that help achieve mental, emotional, and professional development, and learn more positive life skills (Sayed & Rizk, 2002, p. 256). Besides, Goleman defines it as a set of different capacities for success in the different life aspects. He adds that the capacities can be learned and improved, and include the emotional knowledge, the emotions management, the excitement, the perseverance, the self-motivation, and perceiving the others' emotions, and managing the social relations (Said, 2008, p. 11).

The procedural definition of emotional intelligence

It is the awareness about self-emotions and the others' emotions, and the ability to build successful social relations.

Definition of the problem-solving ability

(Al Adl & Abd al Wahab, 2003)define it as the capacity to derive results from given introductions, and says it is the performance where the individual advances towards the known facts to reach the target unknown facts through understanding the causes and factors of the problems we solve (Al Adl & Abd al Wahab, 2003, p. 198). In addition, (Al Zaghloul & Al Zaghloul, 2003)see that it is a state the person seeks to reach goals that are not easily reached due to the unclear method of solving, the difficulty of identifying the methods of achieving the goal, the obstacles that hinder reaching the solution, or due to the use of thinking and mental abilities to perform mental tasks and get out of a situation (Al Zaghloul & Al Zaghloul, 2003, p. 16)

The procedural definition of problem-solving ability

It is using the mental thinking to solve a complicated and unknown problem we face, by relying on the subjective abilities, knowledge, and previous experiences to understand the problem, analyze its factors, perceive the solution, take the decision through choosing one of the potential alternatives, and then make the evaluation.

Literature review

Many studies tackled emotional intelligence and the problem-solving capacity, and others focused on their correlation, as we shall show.

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The study of (Hitama & Ammour, 2021): It aims at examining the relation between the emotional intelligence and the achievement motivation, and the differences between the two genders regarding the degrees of emotional intelligence and achievement motivation. The sample included 156 male and female students from the University of Mouloud Maameri in Tizi Ouzou. The authors used the correlational descriptive method, relying of the emotional intelligence scale made by Abd al Moniim al Derir (2012) and the achievement motivation scale made by Abd al Razak Salah al Ghamidi (2009). Findings show a statistically significant correlation between the emotional intelligence and the achievement motivation, statistically significant differences regarding the degrees of emotional intelligence on behalf of the females, and no statistically significant differences between the two genders regarding the achievement motivation.

The study of (Yahi & Khelaifia, 2020): It aimed at knowing the level of emotional intelligence for the 3rd year secondary school students through revealing the relation between the emotional intelligence and the academic achievement. The authors used the descriptive method and applied the emotional intelligence scale made by (Sayed & Rizk, 2002)&(Abd al Hadi, 2003)after adapting it to the Algerian environment. In addition, they relied on the students' grades in the exams to estimate their academic achievement. The sample included 120 male and female students from a population of 380 students at the secondary school of Cherif Messaadia in Msilain 2016-2017. Findings show that the emotional intelligence level is high, there is no statistically significant relation between emotional intelligence and academic achievement, and there is statistically significant difference regarding the emotional intelligence between the students with high and low academic achievement on behalf of the students with a high intelligence.

The study of (Kaddouri & Dhebihi, 2016): It aimed at knowing the correlation between the emotional intelligence and the problem-solving ability for the secondary school students. The authors used the correlational descriptive method and applied the emotional intelligence scale made by Othman & Rizk (1998) and the problem-solving list of Hebner & Peterson, which was translated by al Samadi (1992). The sample included 131 male and female students from the secondary schools of Houari Boumedien and Barhoum al Jadida in 2013/2014. Findings show a statistically significant relation at .01 between the dimensions of emotional intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) and the ability of problem solving. In addition, it found a statistically significant relation at .05 between the dimensions of social communication and the problem-solving ability.

The study of (Asfour & Ibrahim, 2015): It aimed at knowing the ability of complex problem solving for the university students. The authors used the descriptive method and applied London Tower test on a sample of two hundred male and female students at the University of Baghdad (al Jadiria Campus). After data collection and procession, findings showed that the informants have the ability to solve complex problems.

The study of (Saada, 2015): It aimed at revealing the nature of the relation between the emotional intelligence and the educational leadership ability of the schools' principals. The authors used the correlational descriptive method. For data collection, they chose the test of the ability of the educational leadership of Dr. Mohamed Mounir Morsi and the Emotional Competence Inventory ECI V2 of Goleman & Boyatzis. The sample included 180 principals of primary, middle, and secondary schools. Findings show that it is possible to forecast the educational leadership ability after knowing the emotional intelligence level. Besides, there were no differences regarding emotional intelligence due to the gender. Finally, the emotional intelligence level differs due to the seniority and the educational cycle.

The study of (Meshakba, 2014): It aimed at knowing the differences in the emotional intelligence of the Northern Borders University in KSA that can be attributed to the major (human/scientific), and the differences

in the emotional intelligence due to the educational level (1st year/ 4th year). In addition, the study investigated the relation between emotional intelligence and the ability to take decisions. The authors used a descriptive method based on emotional intelligence and the decision-taking scales. The sample included 216 students from Northern Borders University in KSA. Findings showed statistically significant differences in emotional intelligence due to the major on behalf of the human majors. In addition, there were no statistically significant differences due to the educational level. Finally, the study revealed statistically significant differences between emotional intelligence and decision-taking.

The study of (Al Harahecha, 2013): It aimed at knowing the degree of emotional intelligence for the headmasters of schools in the province of al Mafrag in Jordan from the perspective of the teachers. Besides, it investigated the effect of the social type, the scientific qualification, and the years of experience on the informants' responses. The author used the comparative descriptive method and a questionnaire of fifty-eight items with 05 axes, namely managing emotions, empathy, self-regulation, self-awareness, and the social skills. The sample included 223 male and female teachers. Findings show high emotional intelligence and no statistically significant differences due to experience, social type, and scientific qualification.

The study of (Saada Rachid, 2012): It aimed at revealing the nature of the relation between the emotional intelligence and the ability to manage the professional stress by the school's headmasters. The author used the correlational descriptive method, ECI V2 of Goleman & Boyatzis, and the professional stress scale made by the same author. The sample included 180 principals of primary, middle, and secondary schools. Findings showed it is possible to forecast the principals' level of managing and facing stress after knowing their emotional intelligence levels.

METHODOLOGY

Study population and sample

The study covers 205 students of ISTPSA at the University of Mohamed Khider in Biskra, from which sixty-four students (males and females) from three cycles (bachelor, Master, PhD) were chosen as a sample.

Method of the study

The authors used the correlational descriptive and comparative descriptive methods because they suit the nature of the study.

Study tools

Based on the previous relevant studies, we used the emotional intelligence 5-points scale of sixteen items, translated by Hassan al Maleh, and the problem-solving 4-point scale of forty items with 05 axes (general orientation, definition of the problem, generating alternatives, taking decision, and evaluation).

Table 1. Classification of the emotional intelligence levels.

Degrees of emotional intelligence	Estimations of emotional intelligence
50-70	Very low
70-85	Low
85-115	Average
115-130	High
130-150	Very high

Note. Classification of the levels of the problem-solving scale: 40-80: lack of problem-solving skills. +80: competent in problem-solving.

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The psychometric properties of the study tools

Consistency

Table 2. The consistency of the problem-solving scale using the split-half.

Reliability statistics			
Cronbach's Alpha	Part 1	Value	.695
		N of Items	20[a]
	Part 2	Value	.785
		N of Items	20[b]
	Total N of Items		40
Correlation Between Forms			.711
Spearman-Brown Coefficient	Equal Length		.831
	Unequal Length		.831
Guttman Split-Half Coefficient			.824

Note. Source: Prepared by the researchers.

Table 2 shows a correlation between the even and odd items with a value of .711. In addition, Guttman equation shows an acceptable value of consistency of .831.

Table 3. The consistency of the emotional intelligence scale using the split-half.

Reliability statistics			
Cronbach's Alpha	Part 1	Value	.695
		N of Items	20[a]
	Part 2	Value	.785
		N of Items	20[b]
	Total N of Items		40
Correlation Between Forms			.711
Spearman-Brown Coefficient	Equal Length		.831
	Unequal Length		.831
Guttman Split-Half Coefficient			.824

a. The items are: qq1, qq3, qq5, qq7, qq9, qq11, qq13, qq15.
b. The items are: qq2, qq4, qq6, qq8, qq10, qq12, qq14, qq16.

Note. Source: Prepared by the researchers.

Table 3 shows a correlation between the even and odd items with a value of .788. In addition, Guttman equation shows an acceptable value of consistency of .882.

The discriminate validity

Table 4. The discriminate validity of the problem-solving scale.

Group statistics					
	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
VAR00001	Min	10	95.3000	4.29599	1.35851
	Max	10	135.9000	2.76687	.87496

Independent samples test					
Levene's test for equality of variances					
Sig. (2-tailed)	df	t	Sig.	F	
.000	18	-25.125	.073	3.638	Equal variances assumed
.000	15.370	-25.125			Equal variances not assumed

Note. Source: Prepared by the researchers.

Table 4 shows that the arithmetic mean of the minimum values is 95.30 while of the maximum values is 135.9. As for the significance of the difference to compare the two means using T Student test, the calculated value is -25.125, which is statistically significant at significance level .000. Thus, there are statistically significant differences between the means of the minimum and of the maximum values, and the problem-solving scale has a discriminate validity.

Table 5. The discriminate validity of the emotional intelligence scale.

Group statistics					
	VAR00004	N	Mean	Std. Deviation	Std. Error Mean
VAR00003	Min	10	48.0000	12.18378	3.85285
	max	10	115.4000	8.48790	2.68411

Independent samples test					
Levene's test for equality of variances					
Sig. (2-tailed)	df	t	Sig.	F	
.000	18	-14.354	0.258	1.363	Equal variances assumed
.000	16.071	-14.354			Equal variances not assumed

Note. Source: Prepared by the researchers.

Table 5 shows that the arithmetic mean of the minimum values is forty-eight while of the maximum values is 115.4. As for the significance of difference to compare the two means using T Student test, the calculated value is -14.354, which is statistically significant at significance level .000. Thus, there are statistically significant differences between the means of the minimum and of the maximum values, and the emotional intelligence scale has a discriminate validity.

RESULTS

Presentation and analysis of the results of the first sub-hypothesis

It states that the emotional intelligence level of the students of ISTPSA at the University of Biskra is low.

Table 6. The arithmetic mean, standard deviation, and the emotional intelligence level of the informants.

Variable	**Mean**	**Standard deviation**	**Level**
Emotional intelligence (over all degree)	83.28	22.53	Low

Note. Source: Prepared by the researchers.

Table 6 shows that the arithmetic meant the overall degree of the emotional intelligence scale is 83.28 and the standard deviation is 22.53. In comparison with the approved emotional intelligence levels, this value is low. Thus, the informants have a low emotional intelligence, and the sub-hypothesis is confirmed.

Presentation and analysis of the results of the second sub-hypothesis

Table 7. The arithmetic means and standard deviation of the problem-solving scale and its axes.

Axes	**Arithmetic mean**	**Standard deviation**	**Level**
General orientation	22.95	3.35	High
Definition of the problem	24.32	3.44	High
Generating alternatives	22.54	3.36	High
Taking decision	24.5	3.26	High
Evaluation	21.68	3.71	High
The overall degree	116.01	14.04	High

Note. Source: Prepared by the researchers.

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It states that the problem-solving level of the students of ISTPSA at the University of Biskra is high.

Table 7 shows that the arithmetic means of the problem-solving scale are between 21.68 and 24.5, which are high values. Besides, the arithmetic mean of the overall degree is 116.01 and the standard deviation is 14.04. Thus, the informants have a high level of problem solving and the sub-hypothesis is confirmed.

Presentation and analysis of the results of the third sub-hypothesis

It states that there are no statistically significant differences regarding the emotional intelligence level due to the educational level for the students of ISTPSA at the University of Biskra.

Table 8. Comparing the emotional intelligence levels according to the educational level (Bachelor, Masters, PhD).

		Sum of Squares	df	Mean Square	F	Sig.
Intelligent	Between Groups	1454.061	2	727.031	1.452	.242
	Within Groups	30540.876	61	500.670		
	Total	31994.938	63			

Note. Source: Prepared by the researchers.

Table 8 shows that the value of tests to compare the means of the students according to the educational levels is 1.45, which is statistically insignificant because the significance level 0.242 is more than .05. Thus, there are no statistically insignificant differences in the emotional intelligence level due to the educational level for the informants, and the sub-hypothesis is confirmed.

Presentation and analysis of the results of the fourth sub-hypothesis

It states that there are no statistically significant differences regarding the problem-solving skills due to the educational level for the students of ISTPSA at the University of Biskra.

Table 9. to compare the problem-solving levels according to the educational level (Bachelor, Masters, PhD).

		Sum of Squares	df	Mean Square	F	Sig.
Problem solving	Between Groups	956.322	2	478.161	2.541	.087
	Within Groups	11478.662	61	188.175		
	Total	12434.984	63			

Note. Source: Prepared by the researchers.

Table 9 shows that the value of tests to compare the means of the students according to the educational levels is 2.54, which is statistically insignificant because the significance level .087 is more than .05. Thus, there are no statistically insignificant differences in the problem-solving level due to the educational level for the informants, and the sub-hypothesis is confirmed.

Presentation and analysis of the results of the fifth sub-hypothesis

It states that there is a statistically significant relation between emotional intelligence and problem-solving for the students of ISTPSA at the University of Biskra.

Table 10. Correlation between emotional intelligence and the problem-solving capacity.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.531a	.282	.270	12.00178

a. Predictors: (Constant). intelligence

Note. Source: Prepared by the researchers.

Table 10 shows that the coefficient of Pearson correlation between the two variables is 0.531, which is average. As for R-square, it means that the emotional intelligence variable interpreted the variance in the dependent variable (the problem-solving capacity) with a rate of 28.2. The value of the determination coefficient is close to the value of the correlation coefficient based on the size of the sample and the number of independent variables.

Table 11. Tests to interpret the effect of emotional intelligence on the problem-solving capacity for the informants.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3504.335	1	3504.335	24.328	.000b
	Residual	8930.650	62	144.043		
	Total	12434.984	63			

a. Dependent Variable: total
b. Predictors: (Constant), intelligence

Note. Source: Prepared by the researchers.

Based on the value of F, which equals 24.328, the freedom degrees 62, 01, and 63, and the significance level .000, which are less than .05, we refuse the null hypothesis and accept the alternative. Thus, there is an effect for emotional intelligence on the problem-solving capacity.

Table 12. The coefficients of the equation of the line of regression between emotional intelligence and the problem-solving capacity.

Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	88.454	5.786		15.288	.000
	Intelligence	.331	.067	.531	4.932	.000

a. Dependent Variable: total

Note. Source: Prepared by the researchers.

The value of T helps accept or refuse the null hypothesis. In this regard, the value is 15.288 and the significance level is .000, which is less than .05. Therefore, we refuse the null hypothesis and accept the alternative. In addition, the value of Beta is 0.531 and positive. Thus, the orientation of the relation between the two variables is positive. From the values in column B, we can determine the equation of the line of regression (Y = ax + b). In this context, b = 88.454, a = 0.331, and thus, Y = 0.331x + 88.454. Based on this, we conclude there is a statistically significant correlation between emotional intelligence and the problem-solving capacity, and the sub-hypothesis is confirmed.

DISCUSSION

The results show that the informants' level of emotional intelligence is low, unlike the results of (Yahi & Khelaifia, 2020), and (Al Harahecha, 2013)due to the differences in population, sample, major, and social environment. Thus, the informants need training on the acquisition of emotional intelligence skills through guiding, psychological, and educational programs. Besides, it is necessary to integrate the emotional intelligence skills within the educational programs to increase the cognitive and emotional skills and the academic achievement of the students (Hitama & Ammour, 2021, p. 103).

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Findings show that the problem-solving capacity of the informants is high and they have the qualifications of the academic excellence and of facing the life problems thanks to understanding the problems, the general orientation towards facing and solving the problems, the ability to generate alternatives and take suitable decisions based on the primary data and the target objectives, and the ability to evaluate the results. In this regard, GPS theory of Newwell & Simon (1972) points those problem-solving needs a good representation of the problem through knowing the primary and final states and the accounts. Then, the differences between the primary and the target states are analyzed to choose the suitable calculator. It is an action based on the data of the problem to reduce the gap between the primary and target states and reach solutions. Scientists see that good representation facilitates the process of problem-solving (Bedrina & Rekza, 2004, p. 59).

Findings show no statistically significant differences due to the educational level, as found out by (Hadj Mhamed, 2016) who reported no statistically significant differences in the level of emotional intelligence due to the major and educational level, and by (Mimas, 2013)who found no differences in the means of emotional intelligence due to the major. Since the informants belong to the same academic environment and there are no big temporal differences between the educational cycles (Bachelor, masters, PhD), we find no statistically significant differences in the emotional intelligence level.

Findings show no statistically significant differences in the level of problem-solving due to the educational level. This is also linked to the variable of emotional intelligence, where we find no differences. Based on the statistically significant correlation between the two variables, we find no differences in the dependent variable (the ability of problem-solving). This confirms that mental intelligence alone is not enough for problem-solving, and that emotional intelligence is needed.

Findings show a statistically significant relation between the emotional intelligence and the problem-solving, as confirmed by (Kaddouri & Dhebihi, 2016) who found out a statistically significant relation between the overall degree of the emotional intelligence scale with its dimensions (self-regulation, empathy, self-awareness, motivation, and social communication) and the problem-solving ability. In this regard, self-regulation helps the efficient objective thinking that helps interact with the self, the others, and the social environment. In this context, not finding solutions to problems creates stress and hinders the individual from managing the emotions and the future, because managing the emotions is managing the future (Abu al Nasr, 2008, p. 132).

In addition, we can interpret the relation between emotional intelligence and problem-solving by saying that emotional intelligence involves regulating emotions, self-awareness, empathy, and social communication. Moreover, emotional intelligence is a system of competencies and personal and social skills that affect the ability to deal with life problems and pressures. The individual who has personal abilities can understand, regulate, express, and evaluate the emotions and feelings and, thus, positively solve problems (Kaddouri & Dhebihi, 2016, p. 115).

CONCLUSIONS

We found out that:

- The emotional intelligence level of the students of ISTPSA at the University of Biskra is low.
- The problem-solving level of the students of ISTPSA at the University of Biskra is high.
- There are no statistically significant differences regarding the emotional intelligence level due to the educational level for the students of ISTPSA at the University of Biskra.

- There are no statistically significant differences regarding the problem-solving skills due to the educational level for the students of ISTPSA at the University of Biskra.
- There is a statistically significant relation between emotional intelligence and problem-solving for the students of ISTPSA at the University of Biskra.

AUTHOR CONTRIBUTIONS

The three authors collected, analyzed, and processed the data for this study. The first author was responsible for proposing the study's parameters and general frameworks. Also, data analysis. The other authors collected the study data and analyzed the study data.

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No potential conflict of interest was reported by the authors.

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