Role of Critical Thinking Skills in Student Social Problem Solving: Peran Keterampilan Berpikir Kritis dalam Pemecahan Masalah Sosial oleh Siswa

Mohammed Rafaat Hama Tawfeeq

University of Halabja, College of Basic Education, English Language Department

General Background: Critical thinking has been widely recognized as a fundamental cognitive ability that enhances individuals' capacity to adapt, evaluate, and make rational decisions in complex social contexts. **Specific Background:** Within higher education, students often encounter diverse social challenges that require effective problem-solving strategies, yet little research has explicitly examined the link between critical thinking and social problem solving. **Knowledge Gap:** Despite the acknowledged importance of critical thinking, limited empirical studies have investigated its predictive role in students' ability to resolve social problems, particularly in non-Western academic contexts. **Aims:** This study aimed to analyze the relationship between the subscales of critical thinking and the social problem-solving ability of English language students at the University of Halabja. **Results:** Using a descriptive-correlational design with 179 participants, findings indicated a significant positive correlation between critical thinking components and problem-solving skills, with analysis, assessment, and inductive reasoning emerging as strong predictors, collectively explaining 47% of the variance. **Novelty:** The study highlights the predictive power of specific critical thinking subskills, offering new insights into how cognitive processes underpin social problem-solving competence. **Implications:** The findings suggest that integrating critical thinking instruction into higher education curricula may enhance students' resilience and adaptability in addressing social challenges.

Highlight :

- Critical thinking has a positive correlation with student problem solving ability.

- Subscales like analysis, assessment, and inductive reasoning are strong predictors.

- Results highlight the importance of fostering critical thinking in higher education.

Keywords : Critical Thinking, Social Problem Solving, English Language Students, Higher Education, Cognitive Skills

Introduction

The great developments of the present age in the cultural, social, political, and economic fields have created new problems for human beings, and hence creative, intelligent, and resilient humans are definitely needed to deal with such problems. Humans who can use all their abilities, especially cognitive abilities, in the face of sensitive situations [1]. Today, the goal of teaching science is to train people who can adapt to different situations, think in a flexible way, have creative thinking, solve problems in a multidimensional way, use the skills of the knowledge process in problem

solving, see the world from a scientist's viewpoint, and respectfully accept others and tolerate different opinions [2]. According to behavioral scientists, human beings are thinkers who can overcome difficult situations by using their cognitive abilities. According to philosophers and scientists, human beings have four types of thinking, which are philosophical thinking, critical thinking, creative thinking, and intuitive thinking. Critical thinking is regarded as one of the important cognitive abilities and as one of the skills of thinkers that plays a key role in solving challenging problems [3]. Various definitions of critical thinking have been proposed. Richard Powell considers critical thinking as the ability to achieve logical conclusions based on information observation [4]. Norris defines critical thinking as the way students review all of their prior knowledge on a particular subject, evaluate their own thinking skills, and change their behaviors [5]. Critical thinking is intellectual and logical thinking that is effective in decision making. Critical thinking is a kind of insightful look at the basic matters of life [6][7].

According to the extensive research conducted on the relationship between thinking and various educational concepts, critical thinking has become one of the most important concepts in the field of education and a basic necessity for educational systems in the different countries of the world [8]. Educational experts agree that critical thinking should be an integral part of education at all times because it is the thinking that leads to the best solution through analysis, assessment, selection, and application, and this is what the world needs today [9]. In fact, critical thinking is one of the variables that has been repeatedly addressed in various educational studies, and its relationship with various variables has been investigated [10]. According to the research conducted in the area of critical thinking in different populations, many researchers believe that critical thinking is positively correlated with decision-making, judgment, problem solving, creativity, self-esteem, academic achievement, resilience, self-efficacy, and self-confidence, and that it can play a decisive role in enhancing them [11].

Problem solving is a vital skill for living in the present age [12]. According to the bio-social logic, the issues faced by humans have a significant social rooting, so that humans must use the abilities of themselves and others to solve simple and complex problems that they face every day. In fact, when people use a problem-solving skill to solve individual and social problems, that skill is called social problem-solving skill. The steps of social problem solving are similar to problem solving and are used only in the context of interpersonal and social relationships. Problem solving is an obvious cognitive-behavioral process that not only provides potentially effective responses to difficult situations but also increases the likelihood of selecting the most effective response from multiple responses. Numerous scientific studies have revealed that social bonds and social support from others facilitate solving social problems and make social pressures more tolerable and easier [13]. A review of the evolution of human social interactions shows that the development of human capabilities in solving social problems depends on some individual and social capabilities, among which how issues are mentally represented is of great importance; This means that in the process of growth and development, a person forms various ways of perceiving and analyzing problematic life situations, through which he achieves an understanding of those situations, and relatively fixed approaches are created in the individual's cognitive system by the continual of such encounters with problematic situations [14]. The social problem solving model was first introduced and completed by D'Zurilla et al. In this model, there are three basic concepts: problem solving, problem, and solution [15].

Problem solving is a cognitive-behavioral process in which an individual or group seeks to provide an effective solution to the problems of everyday life. A problem arises when a person has a goal but lacks a clear way to achieve it. A solution is the answer resulting from the problem solving process that can be used in a specific problematic situation [16]. The ability to solve a social problem is a multidimensional construct composed of different abilities. In the original model, it was assumed that the ability to solve a social problem consists of two independent components: problem orientation and problem-solving skills. Problem orientation is a set of cognitive-emotional schemata that reflect a person's feelings and beliefs about life issues. Problem-solving skills refer to cognitive and behavioral activities by which a person tries to understand the problem and find an

effective solution. The four main problem solving skills are as follows:

1) Formulation and definition of the problem

2) Presenting different solutions

3. Decision making,

4. Proving and implementing the solution of the social problem solving questionnaire.

Studies have revealed that people do not act in the same way in social problem-solving situations, meaning that some psychological characteristics, including how information about situations is processed, mediates the analysis of social problems, and that there are obvious differences in how different individuals deal with such issues. Arnold has shown that people with divergent cognitive styles perform better at solving interpersonal problems than people with convergent cognitive styles. Other studies have also shown that the nature of social issues is a determining factor in the performance of individuals with different cognitive styles. In another study, the results showed that cognitive styles can significantly explain the changes related to social problem solving (by 8%), and that there is a significant difference in social problem solving based on different cognitive styles.

According to the research conducted on social problem solving and considering the importance of critical thinking as a determining factor in the development of a problem solving strategy, so far no research has been conducted to address this issue; Therefore, this study deemed it necessary to examine the relationship between critical thinking and social problem solving [17].

Method

This research is applied in terms of purpose. Applied research aims at developing applied knowledge in a specific field and also at the practical application of knowledge. This study is descriptive-correlational in terms of method. In this study, the relationships between the subscales of critical thinking and students' ability to solve social problems were examined. The statistical population in this study includes all the BA English language students of the University of Halabja in 2021-2020. By considering the size of the population in the different faculties, the sample was determined as 179 students by using the Cochran's formula. In this study, the CCTST questionnaire, Form B, and a researcher-developed social problem solving questionnaire were used, which are explained in more detail below. The CCTST questionnaire, "Form B," is a standardized tool for measuring critical thinking skills derived from the Delphi expert consensus definition of critical thinking based on the opinions of 46 experts and theorists in the field of critical thinking in various fields. The test contains 34 multiple-choice questions with a correct answer in five areas of critical thinking cognitive skills. Azizi-Fini determined the reliability of this questionnaire as 0.69 by using the Kuder-Richardson method. In this study, the reliability of the test was also determined by the same method as 0.83, which indicates high reliability and a reliable test [18]. The researcher-developed social problem solving questionnaire is a short form of the revised Social Problem Solving Questionnaire, which is a Likert-type self-report tool with 25 items. This scale is based on the authors' previous work, which has five main subscales and measures five different dimensions of the social problem-solving model by D'Zurilla et al. The subscales are as follows:

1.Positive Problem Orientation (PPO, 3 items 5, 7, 14)

2.Negative Problem Orientation (NPO, 4 items 2, 4, 9, 13)

3.Rational Problem Solving (RPS, 7 items 2, 8, 16, 20, 21, 24, 25)

4.Impulsivity/Careless Style (ICS, 5 items 6, 11, 15, 19, 23)

5.Avoidance Style (AS, 5 items 1, 10, 12, 17, 18)

Each item is answered in five options (false, slightly true, somewhat true, true, and very true). The two subscales of Positive Problem Orientation (PPO) and Rational Problem Solving (RPS) are considered as constructive problem-solving subscales and are scored positively; But other scales, including Impulsive/Careless Style (ICS), Avoidance Style (AS), and Negative Problem Orientation (NPO), constitute dysfunctional problem-solving subscales, which are scored negatively (upside down). Thus, based on this tool, the ability to solve a 'good' social problem is determined by high scores in PPO and RPS and low scores in NPO, ICS, and AS, while the ability to solve a 'poor' social problem is determined by low scores in PPO and RPS and high scores in NPO, ICS, and AS. The reliability of the retest for this questionnaire was reported as ranging from 0.68 to 0.91 and its alpha coefficient as ranging from 0.69 to 95. Has been reported. The construct validity of this questionnaire was confirmed by using the exploratory factor analysis, and its correlation with other scales of problem solving and overlapping psychological construct was also confirmed. Also the analysis of the structure of the factors under study indicates the existence of the five factors mentioned above. All narrative analyses have confirmed the SPSI-R as a measure of social problem solving [19].

Findings

In this section, first the resulting data was analyzed by using descriptive statistical indices, and then the findings obtained from the implementation of the statistical tests were presented to answer the research questions [20]. Table 1 shows the mean and standard deviation of student test scores for different variables.

Variable	Mean	Standard Deviation	Max	Min	Variation Range
Critical Thinking	115.92	20.29	168	69	99
Analysis	14.21	3.42	24	5	19
Assessment	24.50	4.59	39	12	27
Inference	40.57	10.08	63	15	48
Deductive Reasoning	36.64	6.91	52	17	35
Inductive Reasoning	38.82	6.11	50	10	40
Social Problem Solving	144.88	23.92	195	50	145

Table 1. *The Descriptive Statistical Indices Related to Critical Thinking and Social Problem Solving Subscales*

As it can be seen in the table above, the mean and standard deviation values for the critical thinking variable and its subscales, i.e. analysis, assessment, inference, deductive reasoning, and inductive reasoning, are 92, 115, 29, 20; 21, 14, 42, 3; 50, 24, 59, 4; 57, 40, 0.08, 10; 64, 36, 91, 6; 82, 38, 11, 6, respectively, and those of the social problem solving scale are 88, 144, 92, and 23, respectively.

Table 2 presents the matrix of the correlations of critical thinking variables and the social problem solving skills and their subscales. According to the table, all the variables are in a mutual relationship.

Variable	1	2	3	4	5	6	7
Critical Thinking	1	--	--	--	--	--	--
Analysis	0.70	1	--	--	--	--	--

Assessment	0.79	0.63	1	--	--	--	--
Inference	0.89	0.51	0.61	1	--	--	--
Deductive Reasoning	0.76	0.38	0.46	0.51	1	--	--
Inductive Reasoning	0.58	0.55	0.63	0.46	.033	1	--
Social Problem Solving	0.55	0.51	0.59	0.45	0.31	0.74	1

Table 2. *The Matrix of the Correlations of Critical Thinking Variables and the Social Problem Solving Skills and Their Subscales.*

All the correlation coefficients were determined to be significant at the 0.01 level.

Findings related to the Research Questions:

a. Can student critical thinking predict their social problem solving ability score?

Before doing a regression analysis, it should be noted that the correlations between the subscales of critical thinking, that is, analysis, assessment, inference, deductive reasoning, and inductive reasoning, and the social problem-solving ability scale were 0.51, 0.59, 0.45, 0.31, and 0.74, respectively, which were all significant at the 0.01 level. Then, the multiple regression was used to analyze the relationship between student critical thinking and their ability to solve social problems [21] (Table 3).

Source of Variation	Sum of Squares	Degrees of freedom	Mean Square	F	Sig. Level
Predictor	48704.26	4	12176.07		
Remainder	63452.81	192	330.48	36.84	0.001
Total	112157.08	196			

Table 3. *The Results of the Multiple Regression Analysis of the Critical Thinking Subscales*

The results of the multiple regression analysis revealed that the subscales of critical thinking (analysis, assessment, inference, deductive reasoning, and inductive reasoning) can predict students' ability to solve problems in social activities and problems ($P < 0.001$, $F(4, 196) = 36, 84$).

The results also revealed that the square of the multiple correlation coefficient is equal to 0.47, which is high and significant according to Cohen's criteria, and this indicates that the predictor variables (analysis, assessment, inference, deductive reasoning, and inductive reasoning) can explain 47% of changes in the criterion variables (the ability to solve a social problem). The results of the multiple regression analysis were related to the combined effects of predictor variables on the criterion variable [22]. Therefore, it was investigated that which of the predictor variables (analysis, assessment, inference, deductive reasoning, and inductive reasoning) alone is able to predict the criterion variable (the ability to solve a social problem). The results of the regression coefficients are reported in Table 4.

Non-standardized Regression Coefficients		Standardized Regression Coefficients		Sig. Level	
Model					t
B		Standard Error	Beta		
Constant	58.74	8.23		7.13	0.001
Analysis	1.66	0.50	0.24	3.31	0.001
Assessment	2.20	0.41	0.42	5.38	0.001

Inference	0.20	0.17	0.08	1.14	0.255
Deductive Reasoning	0.02	0.22	0.01	0.08	0/940
Inductive Reasoning	3.28	0.62	0.54	7.42	0.001

Table 4. *Non-Standardized and Standardized Regression Coefficients Related to the Critical Thinking Subscales*

The standardized regression coefficients revealed that among the five subscales of critical thinking (analysis, assessment, inference, deductive reasoning, and inductive reasoning), the subscales of analysis (t=3,31, p<0.001), assessment (t=5,38, p<0.001) and inductive reasoning (t=7,42, p<0.001) can be good predictors of the students' ability to solve social problems, while the subscales of inference (t=1,14, p>0.05) and deductive reasoning (t=1,14, p>0.05) could not predict the social problem solving ability [23].

Discussion and Conclusion

The aim of this study was to investigate the effect of critical thinking in BA English majoring students on their ability to solve social problems. Critical thinking itself included the components of analysis, assessment, inference, deductive reasoning, and inductive reasoning. The main research question was whether student critical thinking and its subscales can predict students' research motivation scores. The relationships under study were tested by the multiple regression [24]. The results of this study revealed that there is a positive correlation between the subscales of critical thinking, that is, analysis, assessment, inference, deductive reasoning, and inductive reasoning, with the problem solving ability scale. And the results of the multiple regression revealed that the set of subscales of critical thinking (analysis, assessment, inference, deductive reasoning, and inductive reasoning) can predict students' ability to solve problems in social activities and problems. Predictive variables (analysis, assessment, inference, deductive reasoning, and inductive reasoning) could also explain 47% of the changes in the criterion variable (the ability to solve a social problem) [25].

In addition, the standardized regression coefficients showed that among the five subscales of critical thinking, the subscales of analysis, assessment, and inductive reasoning can be good predictors of students' ability to solve social problems, while the subscales of inference and deductive reasoning are not good predictors of the ability to solve a social problem. The results of this study are in line with previous studies [26].

According to the theoretical and empirical foundations of the study, critical thinking is a positive activity that is necessary for growth and development within any society and organization. It is also necessary to critically evaluate the situation and process conditions. Individual can make a decisive decision by learning to accept the problem as a fact of life, by being optimistic about the future, and by using rational thinking instead of making impulsive and avoidant decisions, and they can identify their strengths and weaknesses by repeatedly reviewing the path taken and try other ways if they encounter obstacles.

Based on the results of the study, it can be concluded that critical thinking causes people to solve life problems rationally by a positive and correct assessment of the current situation rather than by acting emotionally, quickly, and without using their mental abilities. On the other hand, the ability to solve student social problems can be predicted using the power of analysis, assessment and inductive reasoning. Therefore, based on the results of this study, some suggestions can be made for the authorities in the higher education system to increase students' ability to solve social problems and identify the state of critical thinking and its role in predicting students' ability to solve problems. This study was conducted on the BA English language students at the University of Halabja, so caution must be exercised in extending these findings to other students in other universities and disciplines.

References

1. A. M. Al-Zahrani, "From Passive to Active: The Impact of the Flipped Classroom Through Social Learning Platforms on Higher Education Students' Creative Thinking," British Journal of Educational Technology, vol. 46, no. 6, pp. 1133–1148, 2015, doi: 10.1111/bjet.12325.
2. S. J. Armstrong, E. Cools, and E. Sadler-Smith, "Role of Cognitive Styles in Business and Management: Reviewing 40 Years of Research," International Journal of Management Reviews, vol. 14, no. 3, pp. 238–262, 2012, doi: 10.1111/j.1468-2370.2011.00315.x.
3. I. Azizi-Fini, A. Hajibagheri, and M. Adib-Hajbaghery, "Critical Thinking Skills in Nursing Students: A Comparison Between Freshmen and Senior Students," Nursing and Midwifery Studies, vol. 4, no. 1, 2015, doi: 10.17795/nmsjournal25721.
4. S. L. Beilock and M. S. DeCaro, "From Poor Performance to Success Under Stress: Working Memory, Strategy Selection, and Mathematical Problem Solving Under Pressure," Journal of Experimental Psychology: Learning, Memory, and Cognition, vol. 33, no. 6, pp. 983–998, 2007, doi: 10.1037/0278-7393.33.6.983.
5. J. Chaffee, Critical Thinking, Thoughtful Writing. Boston, MA: Cengage Learning, 2014.
6. K. Changwong, A. Sukkamart, and B. Sisan, "Critical Thinking Skill Development: Analysis of a New Learning Management Model for Thai High Schools," Journal of International Studies, vol. 11, no. 2, pp. 37–48, 2018, doi: 10.14254/2071-8330.2018/11-2/3.
7. T. Chen, H. M. Hsu, S. W. Stamm, and R. Yeh, "Creating an Instrument for Evaluating Critical Thinking Apps for College Students," E-Learning and Digital Media, vol. 16, no. 6, pp. 433–454, 2019, doi: 10.1177/2042753019875763.
8. A. Chmitorz et al., "Longitudinal Determination of Resilience in Humans to Identify Mechanisms of Resilience to Modern-Life Stressors: The Longitudinal Resilience Assessment (LORA) Study," European Archives of Psychiatry and Clinical Neuroscience, vol. 271, no. 6, pp. 1035–1051, 2021, doi: 10.1007/s00406-019-01091-2.
9. F. A. D'Alessio, B. E. Avolio, and V. Charles, "Studying the Impact of Critical Thinking on the Academic Performance of Executive MBA Students," Thinking Skills and Creativity, vol. 31, pp. 275–283, 2019, doi: 10.1016/j.tsc.2019.02.002.
10. T. J. D'Zurilla and A. M. Nezu, Problem-Solving Therapy, 3rd ed. New York, NY: Springer, 2010.
11. M. Davies, "A Model of Critical Thinking in Higher Education," in Higher Education: Handbook of Theory and Research, M. B. Paulsen, Ed. Cham: Springer, 2015, pp. 41–92, doi: 10.1007/978-3-319-12835-1_2.
12. T. J. D'Zurilla and A. D'Zurilla, "A Study of the Generation-of-Alternatives Process in Social Problem Solving," Cognitive Therapy and Research, vol. 4, no. 1, pp. 67–72, 1980, doi: 10.1007/BF01173301.
13. I. Georgiou, "Messing About in Transformations: Structured Systemic Planning for Systemic Solutions to Systemic Problems," European Journal of Operational Research, vol. 223, no. 2, pp. 392–406, 2012, doi: 10.1016/j.ejor.2012.06.026.
14. N. N. Gubanov and N. I. Gubanov, "Mental Responses to Risks in Modern Society," in Proceedings of the International Conference on Contemporary Education, Social Sciences and Ecological Studies (CESSES 2018), vol. 283, pp. 1003–1007, Nov. 2018, doi: 10.2991/cesses-18.2018.219.
15. M. Haghparast, F. H. Nasaruddin, and N. Abdullah, "Cultivating Critical Thinking Through E-Learning Environment and Tools: A Review," Procedia - Social and Behavioral Sciences, vol. 129, pp. 527–535, 2014, doi: 10.1016/j.sbspro.2014.03.710.
16. D. H. Jonassen and J. Hernandez-Serrano, "Case-Based Reasoning and Instructional Design: Using Stories to Support Problem Solving," Educational Technology Research and Development, vol. 50, no. 2, pp. 65–77, 2002, doi: 10.1007/BF02504994.
17. E. Lyutykh, "Practicing Critical Thinking in an Educational Psychology Classroom: Reflections From a Cultural-Historical Perspective," Educational Studies, vol. 45, no. 4, pp. 377–391, 2009, doi: 10.1080/00131940902910937.
18. B. I. Makki, M. U. Javaid, and M. U. Javaid, "Level of Work Readiness Skills, Career Self-Efficacy and Career Exploration of Engineering Students," NFC IEFR Journal of

Engineering and Scientific Research, vol. 4, pp. 45–54, 2017.

19. A. J. Martin, G. A. Liem, M. Mok, and J. Xu, "Problem Solving and Immigrant Student Mathematics and Science Achievement: Multination Findings From the Programme for International Student Assessment (PISA)," Journal of Educational Psychology, vol. 104, no. 4, pp. 1054–1073, 2012, doi: 10.1037/a0029152.
20. A. M. Nezu, C. M. Nezu, and T. J. D'Zurilla, Problem-Solving Therapy: A Treatment Manual, 2nd ed. New York, NY: Springer Publishing Company, 2012.
21. C. K. Nguyen, H. T. Tran, and M. L. T. Nguyen, "The Development of a Social Problem Solving Test for Elementary School Students," Journal of Rational-Emotive & Cognitive-Behavior Therapy, vol. 39, pp. 35–57, 2021, doi: 10.1007/s10942-020-00363-y.
22. Ö. Palavan, "The Effect of Critical Thinking Education on the Critical Thinking Skills and the Critical Thinking Dispositions of Preservice Teachers," Educational Research and Reviews, vol. 15, no. 10, pp. 606–627, 2020, doi: 10.5897/ERR2020.4022.
23. A. Sewang and A. Halik, "Learning Management Model of Islamic Education Based on Problem: A Case Study of the Tarbiyah and Adab Department of IAIN Parepare," Talent Development & Excellence, vol. 12, no. 1, pp. 2731–2747, 2020.
24. I. Supena, A. Darmuki, and A. Hariyadi, "The Influence of 4C (Constructive, Critical, Creativity, Collaborative) Learning Model on Students' Learning Outcomes," International Journal of Instruction, vol. 14, no. 3, pp. 873–892, 2021, doi: 10.29333/iji.2021.14351a.
25. M. M. Tapung, E. Maryani, and N. Supriatna, "Improving Students' Critical Thinking Skills in Controlling Social Problems Through the Development of Emancipatory Learning Model for Junior High School Social Studies in Ruteng City," Journal of Social Studies Education Research, vol. 9, no. 3, pp. 162–176, 2018.
26. J. Wang, F. Mann, B. Lloyd-Evans, R. Ma, and S. Johnson, "Associations Between Loneliness and Perceived Social Support and Outcomes of Mental Health Problems: A Systematic Review," BMC Psychiatry, vol. 18, no. 1, pp. 1–16, 2018, doi: 10.1186/s12888-018-1736-5.