




Ulu-Kalın, Ö.& Baydar, A. (2020). The effect of critical thinking skills and emotional intelligence on the epistemological beliefs of students in a child development program. *International Online Journal of Education and Teaching (IOJET)*, 7(4). 1428-1437. <http://iojet.org/index.php/IOJET/article/view/950>

Received: 10.06.2020
Received in revised form: 24.07.2020
Accepted: 20.08.2020

THE EFFECT OF CRITICAL THINKING SKILLS AND EMOTIONAL INTELLIGENCE ON THE EPISTEMOLOGICAL BELIEFS OF STUDENTS IN A CHILD DEVELOPMENT PROGRAM

Research Article

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Abstract

The scientific and technological advances in the current information era have given rise to the need for qualified work force. Individuals are expected to assess their strengths and weaknesses, to have curiosity, to be able to think rapidly and to make accurate decisions, in broader terms, they should have the abilities to think critically, to use emotions in ingenious, sensitive, beneficial and sensible ways, and should be aware of the significance of epistemology. The present study was intended to measure the effect of critical thinking skills and emotional intelligence on the epistemological beliefs of the students enrolled in a Child Development program in a higher education institution. Given such an objective, the Emotional Intelligence Scale, the Critical Thinking Scale and the Epistemological Belief Scale were administered to 102 participant students who were selected via convenient sampling model in the Child Development program of a Vocational School of Health Services in a state university in Turkey. In the data analysis stage, the scale sub-dimensions of skewness and kurtosis values were initially examined in and later on the multivariate normality analysis, multi correlation tests between variables and multiple linear regression tests were performed. The findings revealed that when the “perception” sub-dimension, one of the six dimensions of emotional intelligence increased, the “effort” sub-dimension in epistemological beliefs decreased.

Keywords: Child development, epistemological beliefs, emotional intelligence, critical thinking, Vocational School of Health Services

1. Introduction

Having diverse thinking skills has become a requirement for individuals as a result of the new realities and socio-economic developments in today’s modern world. Instead of pure information exchange, learning how to think has become essential in every education system globally. The schools target to train individuals who have highly developed metacognitive learning strategies with the skills of questioning, accessing information, thinking critically, and producing ideas.

Assumptions, generalizations, prejudices, and stereotypes affect the individuals’ perceptions towards their environment and their behaviors. Cognitive models adopted by the individuals also affect their behavior (Paul, 1984). Critical thinking skills are essential for managing such situations in a robust manner.

Critical thinking skill is defined as the ability to approach, comment, and decide on issues in an inquisitive manner. It includes sub-skills such as establishing cause and effect relationship, revealing similarities or differences in details, categorizing based on certain criteria, determining the appropriateness and validity of information, analyzing, evaluating, interpreting, and making inferences (Karadüz, 2010).

The conflict between the rational and the emotional thinking has been considered as one of the most important discussions since the ancient period. Such a conflict constitutes the core of the debates among the gods of the ancient Greek. It is known that Stoics introduced the idea that emotions harm individuals and the only means for a good life was the use of reason and logic and Christian philosophy continued with the idea that emotions were the elements of evil.

Since the Renaissance era, it has been considered that the mind symbolizes everything that is good, right, and robust, and emotions are the weaknesses in individuals. The Industrial Revolution, which started due to the discovery of steam, resulted in an absolute dominance of mind over emotions, a reality that was not even questioned by the society. The myth of rationality emerged and led to widespread views, such as, rationality was the sole solution to problems and emotions prevented rationality (Robbins, 2000).

Studies in psychology in the early 20th century, the social responses that were freely expressed by the Europeans since the 1960s, and the current developments in science introduced the notion that the emotions of individuals were not detached from their intellectual activities, rather were highly significant for the individuals to sustain their lives. (Çakar and Arbak, 2004).

The most significant characteristics that discern humans from other living beings are their ability to think, question, and investigate. “Knowledge” emerged due to the activities of humans such as meeting their needs, adapting to nature and fulfilling their curiosity since the past to present day. Humans desired to scrutinize what knowledge is, whether accurate knowledge could be obtained, what the value, source, validity, and limitations of knowledge were. Such desire led to the emergence of the philosophy of knowledge or the epistemology discipline (Aydın and Geçici, 2017).

Literature review indicates numerous studies focusing up on different study groups and variables for measuring critical thinking skills (Semerci, 2003; Özdemir, 2005; Akbıyık and Seferoğlu, 2006; Akar, 2007; Şen, 2009), emotional intelligence (Ismen, 2004; Deniz and Yılmaz, 2006; Öztürk, 2006 ; Erdoğan, 2008; Avşar and Kaşıkçı, 2010; Yılmaz Karabulutlu, Yılmaz and Yurttaş, 2011; Delice and Günbeyi, 2013; Sudak and Zehir, 2013), and epistemological belief (Akgün and Gülmez, 2015; Alpaslan and Ulubey, 2016; Özözen Danacı and Pınarcık, 2017; Gül Biçer, 2019). However, there are no such studies that have investigated the effects of critical thinking and emotional thinking on epistemological belief.

The globalized world requires all members of professions to have the ability to adapt easily to development and innovations, make decisions knowledgeably, produce creative ideas, be flexible, develop own personality, in other words, to use their critical thinking ability (Öztürk and Ulusoy, 2008); to observe and regulate the feelings of oneself and others, use emotions to guide reasoning and action, in other words, to use their emotional intelligence (Yeşilyaprak, 2001); to have an idea about what knowledge is and have epistemological beliefs on how learning and knowing occur (Deryakulu, 2004).

Education starts in mother’s womb and continues in formal and non-formal settings of contexts until the end of life. Education programs are constantly transformed and updated to provide an individual model appropriate for the requirements of the era. The pre-school

education constitutes the most rapid and sensitive period of human development. It is acknowledged that education and experiences in the first years of life have important effects on advanced learning ability and future achievements.

Instructor is an important influence in implementing the education programs which were developed, transformed, and updated to bring up individuals appropriate for the requirements of the era. The individual qualifications of an instructor are reflected to students and determine the quality of the education. Preschool instructors and child developers are responsible for preschool education.

Individuals, who are specialized in child development through a two-year degree, evaluate the mental, language, motor, social, emotional development and self-care skills of children between the ages of 0 and 18, who have typical and atypical development, need protection, who work, who are refugees, criminals and hospitalized, and provide services to the child, family, instructors and the society for supporting the skill areas of such children. Child development specialists can influence the life of an individual, contribute to his/her personality development, and bring up individuals who criticize, question, empathize and are knowledgeable.

Given the scope above, the present study aims to scrutinize the answer to the research question of *“Do critical thinking skills and emotional intelligence have an effect on the epistemological beliefs of the students in a Child Development program of a vocational college in a higher education institution in Turkey?”*

2. Method

The research model of the study was the Relational Screening Model the Screening model refers to the totality of the processes that describe a circumstance as exists in the past or in present, facilitate learning and develop anticipated behaviors in an individual. The relational screening model is a screening approach which is intended to determine the presence of co-variation between two or more variables. In relational scanning model the researcher aims to determine whether the variables change together and how the change occurs once it is present (Karasar, 2011).

2.1. Study Group

The study group of the research was composed of 102 students in the Child Development program of a Vocational School of Health Services at a state university in Turkey in 2019-2020 academic year. Out of these 102 students, who were selected via convenient sampling model, 94 were females, and 8 were males.

2.2. Data Collection Tools

The data collection tools of the study comprised; the California Critical Thinking Disposition Inventory (CCTDI), adapted to Turkish by Kökdemir (2003), the Emotional Intelligence Scale, adapted to Turkish by Kayıhan and Arslan (2016), and the Epistemological Beliefs Questionnaire adapted to Turkish by Deryakulu and Büyüköztürk (2005). Detailed information on the scales are as follows:

2.2.1. California Critical Thinking Disposition Inventory (CCTDI)

The inventory was prepared by Facione as an outcome of the “Delphi Report” by the American Society of Philosophers in 1990 and the Turkish validity and reliability studies of the inventory was completed in 2003 by Kökdemir. The internal consistency of the original inventory was determined as 0.88 and the adapted inventory had an internal consistency of 0.82. California Critical Thinking Disposition Inventory (CCTDI) is a six-point Likert-type

scale. The items were evaluated by the expressions “strongly disagree,” “disagree,” “partly disagree,” “partly agree,” “agree,” “strongly agree” (respectively, 1,2,3,4,5, and 6 points). The lowest and highest scores that can be obtained from the inventory are 51 and 306, respectively. Higher scores indicate higher disposition to critical thinking. The items of the inventory, with the numbers 05, 06, 09, 11, 15, 18, 19, 20, 21, 22, 23, 25, 27, 28, 33, 36, 41, 43, 45, 47, 49 and 50, are scored reversely. The inventory consists of six sub-scales, namely, truth seeking (items 06, 11, 20, 25, 27, 28 and 49), open-mindedness (items 05, 07, 15, 18, 22, 33, 36, 41, 43, 45, 47 and 50), analyticity (items 02, 03, 12, 13, 16, 17, 24, 26, 37 and 40), systematicity (items 04, 09, 10, 19, 21 and 23), confidence in reasoning (items 14, 29, 35, 39, 44, 48 and 51) and inquisitiveness (items 01, 08, 30, 31, 32, 34, 38, 42 and 46).

2.2.2. Emotional Intelligence Scale

Kayihan and Arslan (2016) adapted the Emotional Intelligence Scale, developed by Hyuneung Lee and Yungjung Kwak in 2011 in South Korea, in Turkish language. The scale was administered to 249 high school students. The three-dimensional model which consists of 20 items was found consistent via confirmatory factor analysis. Internal consistency, item and factor analyses were carried out to examine the psychometric properties of the scale. The reliability analysis provided a Cronbach Alpha coefficient of .83 for the whole scale, and it was calculated as 0.80 for the present study. The results of the confirmatory factor analysis indicated that the three-dimensional model of the scale was compatible with the Turkish sample ($\chi^2=399.55$, $df=167$, $RMSEA=.075$, $NNFI=.90$, $CFI=.91$, $IFI=.91$, $SRMR=.080$, $GFI=.86$). The scale was acknowledged as a reliable and valid data collection tool to measure the emotional intelligence levels in the education processes of students in Turkey.

2.2.3. Epistemological Beliefs Questionnaire

Epistemological Beliefs Questionnaire, developed by Schommer (1990) for university students, was used to evaluate the system of Epistemological Beliefs. The original scale is in English and consists of 63 items grouped under a four-factor structure, namely, the “Innate Ability,” “Simple Knowledge,” “Quick Learning,” and “Certain Knowledge.” The scale was adapted to Turkish by Deryakulu and Büyüköztürk (2005) for university students. The Turkish version of the scale consists of three factors and 34 items. The first factor, “belief that learning depends on effort,” consists of 18 items, the second factor, “belief that learning depends on ability,” consists of 9 items and the third factor, “belief that there is a single truth,” is 8 items. Epistemological Beliefs Questionnaire is a five-point Likert-type scale, ranging between the scores (1) and (5), between “strongly disagree” and “strongly agree.” High scores refer to immature, underdeveloped, naive beliefs, whereas low scores indicate mature, developed, sophisticated beliefs.

The reliability study of the Turkish version of the scale was conducted by Deryakulu and Büyüköztürk (2005) and the goodness of fit indices determined via the confirmatory factor analysis were $X^2 = 1331,96$ ($sd=524$, $p <.001$), $RMSEA = 0.05$, $RMR = 0.09$, $SRMR = 0.07$, $GFI = 0.89$ and $AGFI = 0.87$. Cronbach alpha internal consistency coefficients, calculated to determine the reliability of the scores obtained from the scale in discerning individuals, was determined as 0.84, 0.69 and 0,64 for the first, second and third factors, respectively, and as 0.81 for the whole scale. The values in the present study were calculated as 0.78, 0.76 and 0.68 for the first, second and third factors, respectively, and as 0.79 for the whole scale 0.78.

2.3. Data Analysis

The data obtained were tabulated using Microsoft Excel and analyzed via the SPSS 25 software. The obtained data were first examined for lost and extreme values. Due to the

completion of these examinations, the data set was prepared for analysis. Subsequently, the data set was scrutinized for problems pertaining to multivariate normality and multi correlation, which were designated as the assumptions required to perform a multivariate analysis. After testing the assumptions, multiple regression analysis was conducted to investigate the extent, which the Emotional Intelligence Scale and California Critical Thinking Disposition Inventory scores predicted the Epistemological Beliefs Questionnaire scores of the students.

3. Findings

Descriptive statistics based on the sub-dimensions of the scales are illustrated in Table 1.

Table 1. *Descriptive statistics based on the sub-dimensions of the scales*

		N	Mean	Standard Deviation	Skewness	Kurtosis
Critical Thinking	Truth seeking	102	27.0882	5.37707	-.312	.168
	Open-mindedness	102	48.4510	7.05933	-.730	.992
	Analyticity	102	49.1176	5.57095	-.701	.399
	Systematicity	102	25.7353	4.10005	-.272	-.015
	Confidence in reasoning	102	30.1667	5.22007	-.189	-.410
	Inquisitiveness	102	39.0000	4.91311	-.276	-.231
Epistemological Beliefs	Effort	102	37.3235	6.46110	.246	-.439
	Ability	102	18.5784	5.13855	.857	.642
	Single Truth	102	25.3039	5.67047	-.193	.247
Emotional Intelligence	Perception	102	24.8431	3.27833	-.125	-.655
	Comprehension	102	23.5196	3.54527	-.490	-.215
	Management	102	30.8922	5.48789	-.853	.941

As seen in Table 1, the mean scores obtained from the sub-dimensions of the scales vary between 18.5 and 49.2. The skewness and kurtosis values for the obtained scores are between -1 and +1, indicating that there exists normal distribution for the sub-dimensions of the scales.

Univariate normal distribution does not always refer to the fact that multivariate normality was achieved. Therefore, for multivariate normality is presented in Figure 2.

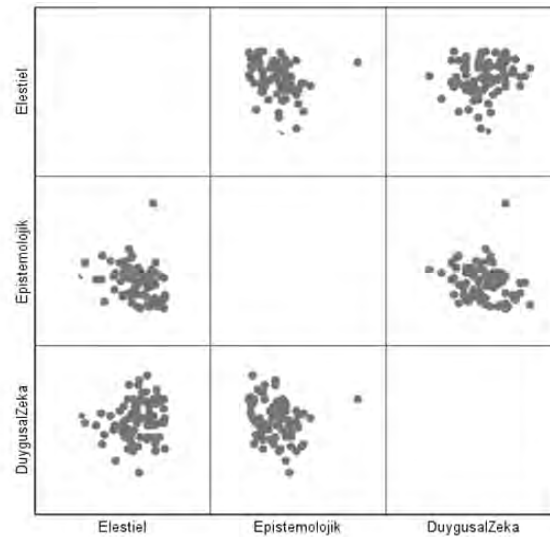


Figure 2. Multivariate normality

Figure 2 indicates that linearity slightly differed from normality. Such condition is considered acceptable based on the number of samples in the present study.

Similar or highly similar dimensions or scales mean that a variable is overused in research. The findings based on the multi correlation test are presented in Table 2.

Table 2: *B and Beta correlation coefficients and significance levels of the variables*

	B	Std. Error	Beta	t	p	Tolerance	VIF
1 Constant	103.049	16,201		6.361	.000		
Truth seeking	-.369	.231	-.174	-1.593	.115	.763	1.311
Open-mindedness	.117	.187	.072	.626	.533	.678	1.474
Analyticity	.545	.260	.267	2.099	.039	.563	1.777
Systematicity	.180	.323	.065	.558	.578	.674	1.484
Confidence in reasoning	-.636	.253	-.291	-2.512	.014	.675	1.482
Inquisitiveness	-.298	.292	-.128	-1.020	.310	.572	1.749
Perception	-.616	.352	-.177	-1.750	.043	.887	1.128
Comprehension	.049	.356	.015	.138	.891	.739	1.354
Management	-.013	.237	-.006	-.056	.955	.697	1.435

Given that the obtained variance inflation factors (VIF) are less than the critical value of 10 and the tolerance values are higher than 0.20, it is concluded that there exists no multi correlation problems between the independent variables, hence the analysis process is initiated. The analysis process focusing on testing the significance of the research model, which measures the extent that Emotional Intelligence Scale and California Critical Thinking Disposition Inventory predict the Epistemological Beliefs Questionnaire scores of the students. The findings are presented in Table 3.

Table 3. *Regression results*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2170.304	9	241.145	2.025	.045 ^b
	Residual	10958.373	92	119.113		
	Total	13128.676	101			

R = .407; R² = .165; Improved R² = .157

Based on ANOVA statistics, multiple linear regression analysis puts forward that the 9 independent variables in the standard model significantly predict the Epistemological beliefs score, which is the dependent variable [F(9-92). =2,025, p<.05]. Furthermore, multiple regression results indicate that 16% of variability in epistemological beliefs questionnaire is explained by factors in emotional intelligence and critical thinking scales.

However, not all sub-dimensions explain the Epistemological beliefs (Table 2). The sub-dimensions, “Analyticity” and “Confidence in reasoning,” in the Critical Thinking Scale and the “Perception” sub-dimension in the Emotional Intelligence Scale are the sub-dimensions that significantly contribute to explaining the Epistemological beliefs. Even though other sub-dimension scores are not significant in predicting the epistemological beliefs, they are beneficial for estimations. The equation formulated due to the analysis results is as follows:

$$\text{Epistemological beliefs} = 103,049 - 0,369 * \text{Truth seeking} + 0,117 * \text{Open-mindedness} + 0.545 * \text{Analyticity} + 0.180 * \text{Systematicity} - 0.636 * \text{Confidence in reasoning} - 0.298 * \text{Inquisitiveness} - 0.616 * \text{Perception} + 0.049 * \text{Comprehension} - 0.013 * \text{Management}$$

Based on the equation, it is understood that a 1-unit increase in “Analyticity” values in the critical thinking scale results with an increase in the epistemological belief of the individual by 0.545 units and such amount is found to be significant. Furthermore, it is observed that a 1-unit increase in “Confidence in reasoning” dimension of the Critical Thinking Scale may cause a significant decrease of 0.636 units in the epistemological beliefs of an individual. Additionally, a 1-unit increase in the Emotional Intelligence Scale sub-dimension, “Perception” may cause a significant decrease of 0.616 in the epistemological beliefs of an individual.

4. Discussion and Conclusion

As a result of the present study, conducted to investigate the effects of critical thinking skills and emotional intelligence on the epistemological beliefs of the students enrolled in the Child Development Program, it is found that individuals lose their beliefs on their accomplishment of a task due to increased perception and self-confidence.

Given that knowledge is perpetual, an individual cannot reach and know each piece of knowledge and grasp it completely. Therefore, there are specific areas of expertise that were developed in line with the interests and requirements of individuals. An individual intends to increase his/her knowledge a certain field or fields of expertise. The fact that information has no limits and the limited knowledge capacity of an individual render such objective unattainable.

Socrates suggested such an approach in his following statements: “The only thing I know is that I know nothing. The factual knowledge is to know that you know nothing.” Such assertion completely coincides with the outcomes of the present research. Increased level of

education lets the individual realize how little he/she knows about plethora of issues. The individual, nevertheless, attains a broad knowledge on limited topics.

Contrary to the findings of the present study, Yılmaz Karabulutlu, Yılmaz and Yurttaş (2011) point out that problem-solving skills of university students increase as their emotional intelligence, determined at a mid-level, increase. The present study has revealed that an increase in the “perception” sub-dimension, one of the six dimensions of emotional intelligence, the “effort” sub-dimension in epistemological beliefs decreased.

Similarly, Özözen Danacı and Pınarcık’s study (2017) shows that individuals with advanced epistemological beliefs have same levels of increase in problem-solving skills and strength. In the present study, it has been determined that increased self-confidence of an individual resulted with decreased efforts in accomplishing a task.

Akgün and Gülmez (2015) report that diverse levels of epistemological beliefs identify in high school students has no significant effect on their academic achievement. Such outcome supports the findings of the present study. It is possible to state that even though the individuals are aware of the means to acquire accurate knowledge, they fail to succeed through the use of such knowledge.

The findings of the present study have exhibited similarities with the studies of Akgün and Gülmez (2015) yet contradict with the findings of Aydın and Geçici (2017). Aydın and Geçici argue that the level of general academic achievement decisively influences the epistemological beliefs of students, with respect to the source and validation of knowledge.

States continue their existence due to the cultivation of the beneficial individuals. Schools attempt to lead individuals to higher education institutions, to life and aim to bring up the productive human model required by the states. Therefore, education programs should be structured in a way as to raise productive individuals who contemplate, question, empathize, struggle, and that are not daunted under any circumstances.

5. Conflict of Interest

The authors declare that there is no conflict of interest.

6. Ethics Committee Approval

The authors confirm that the study does not need ethics committee approval according to the research integrity rules in their country.

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