INVESTIGATING THE RELATIONSHIP BETWEEN CURIOSITY LEVEL AND COMPUTER SELF EFFICACY BELIEFS OF ELEMENTARY TEACHERS CANDIDATES[1]

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ABSTRACT
Nowadays, "lifelong learning individual" concept is gaining importance in which curiosity is one important feature that an individual should have as a requirement of learning. It is known that learning will naturally occur spontaneously when curiosity instinct is awakened during any learning-teaching process. Computer self-efficacy belief is defined as "individual's self-judgment related to computer using". In this context, this study is aimed to analyze the relation between elementary teacher candidates' curiosity level and computer self-efficacy belief who will raise the future information society. The study conducted with senior teacher candidates of Elementary Education Department - Mathematics, Science, Social Sciences and Elementary Education in Hasan Ali Yucel Education Faculty at Istanbul University in 2009 - 2010 academic years. "Computer Self-Efficacy Belief Scale" developed by Aşkar and Umay (2001) and "Curiosity Scale" adapted in Turkish by Demirel and Coşkun (2009) were used as data collection tools. SPSS 13.00 was used for whether there is a relationship between data.
According to gender variety, findings showed "Self-Efficacy Belief regarding to computer did not differ, female students' curiosity level was statistically higher than male students, and there was a connection between total score of "Self-Efficacy Belief Scale and Curiosity Scale" total score and Width Dimension Score, but there is no connection with Depth Dimension Score.

1. INTRODUCTION
The natural curiosity of human being resulted with developing of civilization and making scientific researches with huge acceleration (Berlyne, 1978; Loewy, 1998). Curiosity is the desire of receiving new information and experiences (Litman & Silvia, 2006). Besides, it has defined as motivation for an exploring behavior (Litman, 2005; Litman & Silvia, 2006).

People show signs of curiosity in their early ages. Piaget associates curiosity with the needs of children who try to make the world more logical (Loewenstein, 1994). Premise studies on curiosity have begun in 1960s. Primary Studies on curiosity centered on three points. Firstly, institutional framework of curiosity and underlying causes were intended to determine, then why different and interesting things awaken a person's curiosity was investigated and finally a couple of studies with limited experiments were held to show what were the situational determinants (Loewenstein, 1994).

Berlyne, whose theory finds wide acceptance on literature, did the premise studies on curiosity instinct (Reio, 1997; Ünal, 2005). Berlyne's theory (1960) explains curiosity in two types. These are perceptual and

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informational-epistemic curiosities. Perceptive curiosity contains (seeing, hearing) directed sensual conceptions which are used for getting information about complex or undetermined objects in kind a ways such visual inspection with awakening of curiosity (Berlyne, 1957 cited in Ünal, 2005). Epistemic curiosity examines the questions and proposition to get true information that is activated by conceptual undetermined or complex ideas such as (theories of knowledge, mental cross words (Berlyne, 1954 cited in Ünal, 2005). Schmitt and Lahroodi (2008) investigated value of curiosity with the scope of knowledge in their studies. They defend an appetitive account of curiosity, viewing curiosity as a motivationally original desire to know that arises from having one's attention drawn to the object and that in turn sustains one's attention to it. Distinguishing curiosity from wonder, they explore several sources of the epistemic value of curiosity. First, curiosity is tenacious: Curiosity whether a proposition is true leads to curiosity about related issues. Second, it is related to our field of interest. Last, and most important, curiosity is largely independent of our interests. It fixes our attention on objects in which we have no antecedent interest, thereby broadening our knowledge on it.

Curiosity is a concept that influences human behavior in both positive and negative ways at all stages of the life cycle. It has been identified as a driving force in child development (Stern, 1973; Wohlwill, 1987) and as one of the most important spurs to educational attainment (Day, 1982). Curiosity is accepted as a trigger of learning process (Demirel & Coşkun, 2009) and assumed has positive effects on learning (Malone & Lepper, 1987). It is known that when curiosity incentive is mobilized in any learning-teaching process learning will occur spontaneously (Demirel & Coşkun, 2009). Many of studies showed that curiosity triggers exploring behaviors and encourages cognitive, social, sensual, spiritual and physical development (Kashdan & Roberts, 2004; Loewenstein, 1994).

When we consider the human being in terms of information and technology we reached, it can be said that curiosity is on the basis of all studies. According to Fromm, the ability of curiosity means for an individual to deal with incompatibility and tension, to be directed to new changes, to be aware of his/her life and to react with his/her all ego (Davaslıgil, 1989). According to Maw and Maw (1986) a curios individual should have these features below:

- Reacts positively to new, different, mysteries and opposite demonstrations in his/her environment, affects them and uses them perfectly
- Shows passion of learning more about himself and environment
- Initiative new experiences and examines environment
- Investigate any topic and show persistence on examining (Köymen, 2002).

Curiosity is defined as the positive emotional–motivational system oriented toward the recognition, pursuit, and self–regulation of novel and challenging information and experiences. It is very important in the field of education, which pushes student to learn more as well (Kashdan & Roberts, 2004).

It is highlighted that people who show great effort to accomplish, never retreat when face difficulties and who are patient and insistent have high level of self-efficacy belief (Aşkar & Umay, 2001). Self efficacy is one concept of social learning theory which explains human behavior in terms of continuous reciprocal interaction between cognitive, behavioral, an environmental influences and people's judgments of their capabilities to organize and execute courses of action required to attain (Bandura, 1997). According to Bandura (1977) individual efficacy is not a feature of ego system or a determining feature, on the contrary it is dynamic way of individual capacities that consist of combination of success in jobs, self-motives, self regulation mechanism and self-system. Perceived self-efficacy is estimation of his own capacity and it affects performance and is affected by performance (Demirel, 2009).

Self-efficacy concept which was started to be discussed by Bandura in 1977 has been studied associating with many variations in many fields such as developmental psychology to science education, mathematics to computers. Bandura's self-efficacy belief has become one of studying fields of experts and professionals who works in teachers training and education. Evaluation of the self efficacy belief of teachers and teacher candidates in any field (science, mathematics, etc.) gives them opportunity to estimate their behaviors more accurately (Baki, Kutluca and Birgin, 2008).

Computer self-efficacy belief is defined as "estimation of computer using of an individual" (Delcourt & Kinzie, 1993; Compeau & Higgins, 1995; Khorrami, 2001). The studies in the field showed that individuals whose computer self-efficacy's level is higher that are more desire and interests in using computer and have higher expectations from kind of studies. In addition, when these individuals encounter difficulty in any of the computer; they can easily cope with (Karsten & Roth, 1998; Akkoyunlu & Orhan, 2003).

Computer technology has an essential role in modern education. In this context, it is expected from the teacher candidates to have higher levels of self-efficacy perceptions about using computers in education and higher curiosity for reaching the information. In the literature, there are limited number of studies on the elementary teacher candidates' perceptions of computer self-efficacy and scarcely any about the level of curiosity. Besides there is no study on examining the relationship between teacher candidates' curiosity and computer self efficacy.

2. PURPOSE OF THE STUDY
In this study, it is aimed to determine the relations between level of curiosity and self-efficacy beliefs of Mathematics, Science, Social Sciences, and Classroom teacher candidates.
Sub-problems of the study:

1- What is level of curiosity of elementary teacher candidates? Is there any relation between Curiosity Scale and sub-dimension scores?
2- Does elementary teacher candidates 'Curiosity' levels differ according to gender and the department variables?
3- Does teacher candidates' Computer Self-Efficacy differ according to gender and the department variables?
4- Is there any relation between level of "Curiosity" and "Computer Self-Efficacy Perceptions" of elementary teacher candidates?

3. METHODS
In the study relational survey method was adapted. Relational survey model is aimed to determine the presence of the covariance or the level of covariance between two or more variables (Karasar, 1998).

3.1. Population and Sample
Population of the study is the senior students of Hasan Ali Yucel, Education Faculty of Istanbul University and sample is 155 teacher candidates from department of Elementary Class (N:49), Social Science (N:23), Science (N:38), and Mathematics (N:45) teachers in Education Faculty of Istanbul University. The gender distribution of total students body has been approximately 71% of the students (N = 110) female and 29% (N = 45) is male.

3.2. Data Collection Tools

3.2.1. Curiosity Index
"Curiosity Index" which was adapted into Turkish by Demirel and Coşkun (2009) is used as data collection tool. The scale has two sub-dimensions named such breadth (27 items) and depth (20 items). Breadth of curiosity is the type where an individual may be interested in and examine a wide array of topics. On this dimension of curiosity, the individual wishes to face various encouraging experiences Depth of curiosity is the level of interest in a single topic, an individual is being curious about a subject, an idea or a person, and trying to learn continuously about them. On this dimension, the individual wants to enquire into a field or topic of interest in detail and to increase his gains (Fulcher, 2004 cited in Demirel and Coşkun, 2009).
"Curiosity Index" consists of 47 items. Answers are 6 point likert-scale 1. "Completely Agree", 2. "Mostly Agree", 3. "Slightly Agree", 4. "Slightly Disagree", 5. "Mostly Disagree", 6. "Completely Disagree". The reliability of 3rd version of Curiosity Index is .93 ($p<0.01$) . The reliability of this study was decided as .91 ($p<0.01$).

3.2.2. Computer Self-Efficacy Belief Scale
Computer Self-Efficacy Belief Scale which were developed by Aşkar and Umay (2001) to determine computer self-efficacy belief of students were used in the study. There are 18 articles which 7 of them were scored in the reserve direction in the scale. According to the scale answers are Likert scale type like, between (5) "Always" (1) "Never". Cronbach's alpha was calculated as 0,71 by Aşkar and Umay (2001) who surveyed on university students. Cronbach's alpha was calculated as 0,85 in the study.

3.3. Analyzing of Data
1) Group t-Test whether "Curiosity" and "Computer Self-Efficacy Belief" shows any difference by gender,
2) LSD Technique which is used for the times explaining situations and Variation Analysis (ANOVA) Technique whether "Curiosity" and "Computer Self-Efficacy Belief" shows any difference by departments,
3) To determine the relations between total scores of scales, which were used as data collection tools, and "Curiosity Scales' dimension scores Pearson Correlation Coefficient Technique were used in the study.

4. FINDINGS

In this section, statistics from scales were used to determine level of "curiosity" and Computer Self-Efficacy Belief of students of elementary department in Hasan Ali Yucel Education Faculty at Istanbul University. Results from Group t-Test, Variation Analysis (ANOVA), LSD and Correlation Coefficient Techniques were used to determine whether "curiosity level " and Computer Self-Efficacy Believes showed any differences according to several variables.

Tables related to the research problems are given respectively at below.

Table 1. Descriptive Statistics on Students' Curiosity Level

	N	Min	Max	$\bar{x}$	Ss
Curiosity Score	155	146,00	258,00	212,86	25,80

The highest score is 282, the lowest score is 47 at Curiosity Scale and expected score average is 165. According to analysis received from Curiosity Scale the lowest score is 146, the highest score is 258 and the average score is 212.86. According to the statistics, the level of curiosity of teacher candidates' average score is higher than normal average score.

Table 2. Descriptive Statistics on Curiosity Scale Sub Dimensions

Scale Sub-Dimensions	N	$\bar{x}$	Ss
Breadth	155	118,20	13,96
Depth	155	94,66	13,89

According to the curiosity scale sub-dimension statistics, teacher candidates' breadth dimension score average (X=118,20) is higher than depth dimension score average (X=94,66).

Table 3. Pearson Product Moment Correlation Analysis Results to Determine the Relationship between Curiosity Scale Total Score with Sub Dimensions Scores

Variable	N	r	p
Curiosity Scale Total Score Breadth Dimensions Scores	155	0,927	0,000
Curiosity Scale Total Score Depth Dimensions Scores	155	0,926	0,000

** Correlation is significant at the 0.01 level

As can be seen in Table 3, According to the Pearson product moment correlation analysis results, there is a positive relation statistically at the level of p<.01 between Curiosity Scale Total Score and dimensions scores. Curiosity Scale Total Score has relation with Breadth Dimension Score (r=0.927; p<.01) and Depth Dimension Score (r=0.926; p<.01

Table 4. Independent Simple t-Test Results to Determine the Whether the Scores Differ By Gender

	Gender	N	$\bar{x}$	S	Sd	T	P
Curiosity Scale Breadth Dimensions Scores	Female	110	119,94	13,52	153	2,472	0,015
	Male	45	113,93	14,25			
Curiosity Scale Depth Dimensions Scores	Female	110	96,66	13,66	153	2,866	0,005
	Male	45	89,77	13,37			
Curiosity Scale Total Score	Female	110	216,60	24,68	153	2,891	0,004
	Male	45	203,71	26,45			
Computer Self-Efficacy Scale Total Score	Female	110	60,00	11,56	153	-,618	0,537
	Male	45	61,20	9,00			

According to the Unrelated Group t-Test analysis results which aims to see whether there is a difference by gender indicate that there is a statistically significant difference between the mean scores of teacher candidates.

Female Teacher Candidates "Breadth Dimension" scores ($\overline{x}$ =119,94), "Depth Dimension" scores ($\overline{x}$ =96,66), "Curiosity Scale Total" Scores ($\overline{x}$ =216,60) and total scores ($\overline{x}$ =67,98) are higher than Male Teacher Candidates. However, Computer Self-Efficacy Scale score Scale is not a statistically significant according to the gender variable.

Table 5. One Way Variance Analysis (ANOVA) Results to Determine The Computer Self-Efficacy Belief Scale Scores According the Department Variable

Score	Sour. Var.	KT	Sd	KO	F	p
Science Education Department	Between Groups	1101,904	3	367,301	3,246	0,009
	Within Groups	17085,580	151	113,150		
	Total	18187,484	155			

Results of one way variance analysis (ANOVA) which aimed whether arithmetic mean of Computer Self-Efficacy Belief Scale indicates differences by department showed that there is statistically difference between departments' arithmetic means. After ANOVA analysis LSD test was performed to determine which group shows significant difference. Science Teacher candidates' score average (63,76), is statistically higher than Mathematics Teacher candidates' score average (57,60), Classroom Teacher candidates' score average (58,83), Social Sciences Teacher candidates' score average (63,34).
Computer Self-Efficacy Scale arithmetic means is not a statistically significant according to the department variable.

Table 6. Pearson Product Moment Correlation Analysis Results to Determine the relation between Computer Self-Efficacy Belief Scale Total Score with Curiosity Scale Total Core and Sub Curiosity Scale Dimensions Scores

Variable	N	R	p
Computer Self-Efficacy Belief Scale Total Score Breadth Dimensions Scores	155	0,174	0,031
Computer Self-Efficacy Belief Scale Total Score Depth Dimensions Scores	155	0,166	0,039

As it is seen on Table 6, Results of Pearson Product Moment Correlation Analysis which aimed to determine whether there is relation between Computer Self-Efficacy Belief Scale Total Score, Curiosity Scale Total Score and Breadth Dimension scores showed that there is statistically positive relation at p<.05 level. According to this, Computer Self-Efficacy Belief Scale Total Score has been found related to Curiosity Scale Total Score (r=0.166; p<.05) and Breadth Dimension Scores (r=0.174; p<.05). After all, there is no connection between Computer Self-Efficacy Scale Total Score and Curiosity Scale Depth Dimension Score.

5. DISCUSSION AND CONCLUSION
According to the findings of this study, which aimed to determine level of computer self-efficacy belief and curiosity of elementary teacher candidates who will teach to future generation, teacher candidates' curiosity level is above the median of scale and breadth dimension average score is higher than depth dimension average score. Demirel and Coşkun (2009) research supports these findings. Their study indicates that curiosity levels of university students is above the scale overall average point. This proves that university students have very high-level of curiosity. However university students' high curiosity level does not explain the curiosity concentration direction alone. Having higher breadth dimension score than depth dimension score means that university students are interested in various fields that make them not to concentrate on specific field. It also shows that they can be curious about anything that they are open to interest in. In general, however being interest in learning is a positive characteristic of curiosity and it is discussed in two ways. Breadth of curiosity is the type where an individual may be interested in a wide array of topics. Depth of curiosity is the level of interest in a single topic, on this dimension; the individual wants to enquire into a field or topic of interest in detail and to increase his gains.

Findings by genders show that "Computer Self-Efficacy Belief" did not show any difference and female students have high-level curiosity than male students. The study has similar results with other studies in literature that computer self-efficacy belief does not change by gender (Akkoyunlu & Orhan, 2003). However, there are also other studies indicates that level of computer self-efficacy belief of male students is higher than female students

(Cassidy & Eachus, 2001; Işıksal & Aşkar, 2003; Berkant & Efendioğlu, 2010) and studies by Ekici and Berkant (2007) also show that level of computer self-efficacy belief of female students is higher than male students. These contradictory situations originated form expansion of computer use among both girls and boys. However, when the studies about curiosity level related to gender in the literature was examined; different results were obtained in different scales. Demirel and Coşkun (2009) study about comparing curiosity level showed the male students' level of curiosity was found to be higher than that of female students. At this stage curiosity should be shaped by culture, environment and other factors. Comprehensive studies about curiosity and its relationship with gender factor will clarify this finding.

Curiosity scores do not differ according to the department variation. Science teacher candidates' Computer Self-Efficacy Belief Scale scores are higher than Mathematics, Social Sciences and Classroom teachers. Morrell and Caroll (2003) indicated, science teacher candidates take many science courses and that increases their self-efficacy beliefs in their study. Curiosity scores show no difference according to the department is open to discussion and investigation.

Computer Self-Efficacy Belief Scale and Curiosity Scale Total Scores have connection to Breadth Dimension Score but there is no connection with Depth Dimension Score. According to the research of Demirel and Coşkun (2009), higher breadth dimension score average than depth dimension score average showed that students are not specific enough on their career interest and tendency.

Studies indicate that self efficacy belief affected by experiences and environments it was revealed that those affect qualification and continuous computer using. This two-way interaction is one of the guides to the regulation of the educational process. In this context, "lifelong learning individual" is becoming more important concept in today's education, take in consideration this is the first research that examine the teacher candidates Computer Self-Efficacy Belief and Curiosity Level and similar quantitative and qualitative studies should be carried out in the future. In addition, it is suggested that for enhance the teacher candidates' self-efficacy and curiosity level applied courses number should be increase beside the area courses. This research, conducted in only one university with elementary, social science, science and mathematics department students of education faculty. Similar studies should be carried with other elementary teacher candidates and investigated the relations by gender. Moreover, other studies should be done with different faculty students. It is believed that conducting studies describing the curiosity property of both higher education students and elementary as well as secondary education students, and demonstrating the relations with differing variables will contribute to the field literature.

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