

Research Article

Critical reading self-efficacy of gifted students¹

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Abstract

The present study aimed to determine the critical reading self-efficacy levels of gifted students and to discuss certain variables that affect self-efficacy levels. The study was conducted with 299 (Female: 138, Male: 161) students attending four Science and Arts Centers (SACs) in Ankara during the 2022-2023 academic year. The participants were 5th and 6th grade students in the Recognition of Individual Talent (RIT) program. Participant Data Form and Critical Reading Self-Efficacy Scale were used to collect the data. The study was designed with the quantitative relational research method and the analyses were conducted on the SPSS software. The study findings were analyzed with descriptive statistics, independent samples t-test, and ANOVA. Analysis findings revealed that the critical reading self-efficacy levels of the gifted students were high. Ownership of a private library significantly affected the critical reading self-efficacy levels of the gifted students. In other words, the critical reading self-efficacy level of the students who had a library was higher than those who did not. Furthermore, students who read books every day had higher critical reading self-efficacy skills when compared to the students who did not read books every day. Other study findings demonstrated that gender, education level of the parents and household income did not have a significant effect on the critical reading self-efficacy level. In the study, it was also determined that gifted students mostly read science fiction and scientific books.

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Introduction

Current advances in digital technologies led to the popularization of new media tools and increased the significance of data in the changes observed in modern life. Undoubtedly, individuals, societies and states that could keep up with these changes and technological advances acquired advantages in global competition. Education plays a critical role in the ability of modern society to cope with technological innovations and developments. Thus, the aim of education is no longer to get a diploma that allows the acquisition of only technical knowledge, but it aims to train individuals who can adapt to current requirements, have a high foresight and a critical approach. The aim of education is to train individuals with critical knowledge that would allow them to distinguish between true and false information and create concepts and philosophies about rapid information updates. Thus, curricula, a dominant component in education, should be

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revised based on current requirements and developments. Curricula would also contribute to the training of individuals with 21st century skills. Certain 21st century skills such as critical thinking, media literacy and digital literacy emphasize reading, comprehension and interpretation skills (Voogt & Roblin, 2010). Critical thinking skills play a key role in contemporary educational approaches, and acquisition of these skills have been considered among important educational goals. According to Larsson (2017), one of the most important goals of education is the development of critical thinking skills among the students.

Critical thinking that plays a key role in education could be described as the collective skills of active data collection, use, analysis, and application of that data (Din, 2020). Thus, critical thinking allows the individuals to question their premises, beliefs and approaches. To acquire critical thinking skills, individuals should also have critical writing, critical listening and critical reading skills. The concept of critical reading includes two interrelated concepts that are not independent from critical thinking (Sahin, Diliduzgun, & Tascilar, 2020). The correlation between these two concepts would be associated when individuals acquire critical reading skills at a young age and make this a habit and transfer it to other stages of life, with improved critical thinking skills (Kurnaz & Nas, 2022).

The acquisition of critical reading skills requires re-interpretation of the newly acquired information by filtering it through self-knowledge, experiences, reason, and logic (Ozdemir, 2009). Critical reading includes paying attention, doubting, asking questions and metacognitive thinking, where the individual concentrates on a text, harbors strong and systematic doubts, but could be convinced by adequate evidence. Furthermore, critical reading could lead questions at every stage of the process (Ciftci, 2006). Metacognition, which plays a key role in critical reading, allows individuals to organize reading strategies and construct learning, examine the reading text in depth, with care, and in detail (Karaday, 2013) to make an inference. Critical reading is different from the basic reading skills since it requires inference, interpretation and analysis (Karadeniz & Gursoy, 2014). In critical reading that covers all these skills, the course syllabi focus on student queries and analysis with a critical approach after the comprehension of the material (MEB, 2019). Thus, critical reading is required for the individuals to fully comprehend the text and achieve permanent learning. Previous studies reported that high-level thinking and reading comprehension skills and academic achievement of the students improved with critical reading skills (Sahin, 2019b; Unal, 2006). In critical reading, the student is expected to analyze and question the text in depth and develop various approaches. In critical reading, the individual could distinguish different aspects of the text, the ideas advocated by the author, the author's perspective, the difference between the facts and opinions, understand the difference between emotions and ideas, and investigate events in detail (Aydin, Erol, & Kaya, 2020).

Critical reading self-efficacy is among the significant factors that improve critical reading skills (Ozdemir, 2017). Critical reading self-efficacy was described as the individual judgment about whether the individual had the skills required to complete a task (Bandura, 1986). Critical reading self-efficacy is the belief of the students in their critical approach when reading (Schunk & Pajares, 2009), an affective factor that triggers critical reading to achieve a goal (Sahin, 2019a), and the belief in the ability to employ the skills required for critical reading (Kurnaz & Nas, 2009). 2022). All these descriptions demonstrated that critical reading self-efficacy was required for active, permanent and effective learning.

The present study aimed to investigate the effects of certain variables on critical reading self-efficacy levels of junior high school students attending the Science and Arts Centers program in four central districts in Ankara province. The research questions were determined as follows:

- What are the critical reading self-efficacy levels of SACs' students?
- Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on the grade?
- Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on gender?
- Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on household income?

- Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on parental education level?
- Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on library ownership?
- Is there a significant correlation between the daily reading duration and critical reading self-efficacy skills of SACs' students?
- What kind of books SACs' students prefer to read?

Literature review revealed only a few studies on critical reading self-efficacy and science and arts centers. Studies were mostly conducted with primary school students attending formal education institutions. (Duran, 2013; Karabay, 2013; Ozmutlu et al., 2014; Ozdemir, 2017; Sahin, Diliduzgun and Tascilar, 2020; Kurnaz and Nas, 2022; Dogan, Gunes and Demir, 2022). It could be suggested that the present study on the gifted students and their critical reading skills would contribute to the literature. Since critical reading self-efficacy plays a key role in educational activities due to its correlation with active and critical thinking, digital literacy and media literacy 21st century skills.

Method

The Research Model

The present research is a relational study that aimed to determine the critical reading self-efficacy levels of students attending the Science and Arts Centers and certain variables that affect these levels. The relational research method is employed to determine the status of the variables and the correlations between these variables (Karasar, 2011). In the present study, the critical reading self-efficacy level variable and other variables that affected this variable (grade, gender, parental education level, household income, library ownership, and daily reading), and the types of books that students read were discussed.

The study was approved by the Middle East Technical University, Human Research Ethics Committee (IAEK) (protocol number: 0153-ODTUIAEK-2023; date: 28.02.2023). The field study permission was obtained from Ankara Provincial Directorate of National Education (no: E-14588481-605.99-69294815; date: 26.01.2023).

Study Group

The study sample included 5th and 6th grade junior high students attending the RIT1 and RIT2 programs in four Science and Arts Centers in the central districts of Ankara province during the 2022-2023 academic year. Participant demographics is presented in Table 1.

Table 1. Participant demographics

SACs	Gender		Grade		N
	Female	Male	5th	6th	
A	58	56	42	72	114
B	28	46	43	31	74
C	38	31	28	41	69
D	14	28	24	18	42
Total	138	161	137	162	299

In Table 1, four Science and Arts Centers located at central Ankara districts, where the study was conducted are coded with letters (A, B, C and D). Participating students attended 5th and 6th grades. These students attended Recognizing Individual Talents program at the Science and Arts Centers, and 5th graders were coded as RIT 1 and 6th graders were coded as RIT 2. In the study, maximum variation, a non-random sampling method, was selected to assign the participants. Maximum diversity was employed to improve diversity (Buyukozturk et al., 2008). Thus, the authors aimed to include a diverse sample based on gender, parental education level, household income, and number of students in each program.

Data Collection Instrument

The study data were collected with the Participant Data Form and Critical Reading Self-Efficacy Scale. The Participant Data Form included questions about the Science and Arts Center that the student attended, the program type (RIT 1 and RIT 2), student grade, parental education level, average monthly household income, and daily reading. The Critical Reading Self-Efficacy Scale was developed by Kurnaz and Nas (2022), and the study was conducted with 722 junior high school students. In the study, a 5-point Likert-type scale that included 4 sub-dimensions (analysis, inquiry, difficulty and research) and 19 items was developed. All items in analysis (7 items), inquiry (5 items) and research (3 items) scale sub-dimensions included positive and all items in the difficulty (4 items) sub-dimension included negative statements. A high scale score reflected high critical reading self-efficacy level. The reliability coefficients of the scale sub-dimensions were .80 for the analysis, .77 for the inquiry, .79 for the difficulty, and .73 for research, and .87 for the whole scale. The permission to use the scale was obtained from the authors via e-mail.

Data Analysis

The analyses were conducted on SPSS software in the present relational study. Descriptive statistical analysis was employed to determine critical reading self-efficacy levels of the students, independent samples t-test was used to determine the effects of the gender and grade variables on the critical reading self-efficacy level because if the number of groups being compared is two, t-test is used. One-way ANOVA was conducted to determine the effects of the other variables on critical reading self-efficacy level because if the number of groups is more than two, one-way ANOVA is used.

Findings

In the study, initially, the first research problem, namely "What are the critical reading self-efficacy levels of SACs' students?" was addressed. To determine this problem, the arithmetic mean of the student scores in Critical Reading Self-Efficacy Scale sub-dimensions and the overall scale was analyzed. The findings are presented in Table 2.

Table 2. Descriptive statistics of sub-dimension and total scale scores

Factor	N	Minimum	Maximum	\bar{x}
Analysis Sub-Dimension	299	7	35	28.27
Inquiry Sub-Dimension	299	5	25	18.62
Research Sub-Dimension	299	3	15	8.95
Difficulty Sub-Dimension	299	4	20	16.09
Total scale score	299	19	95	71.94

Table 2 includes the minimum and maximum sub-dimension and total Critical Reading Self-Efficacy Scale scores, and the mean student scores in each sub-dimension and the overall scale. As seen in Table 2, the mean student score in the analysis sub-dimension was 28.27. The mean score in this sub-dimension that included 7 items ($28.27/7=4.04$) was high (An item is scored between 1 and 5 on a 5-point Likert scale. As the mean score of each item approaches 5, it indicates a high value, and as it approaches 1, it indicates a low value). This reflected that the students had acquired the desired critical reading self-efficacy level in the analysis sub-dimension. The arithmetic mean student score in the inquiry sub-dimension that included 5 items was 18.62 ($18.62/5=3.72$) and high, demonstrating that the students' critical reading self-efficacy levels were at the desired level in the inquiry sub-dimension. The arithmetic mean student score in the research sub-dimension that included 3 items was 8.95. This sub-dimension score ($8.95/3=2.98$) was average, demonstrating that the students' critical reading self-efficacy levels in the research sub-dimension were lower when compared to other sub-dimensions. The arithmetic mean score in the difficulty sub-dimension that included 4 items was 16.09. The sub-dimension score ($16.09/4=4.02$) was high, demonstrating that the students' critical reading self-efficacy levels were at the desired level in the difficulty sub-dimension. Finally, the mean overall scale score was 71.94 ($71.94/19=3.79$) and high, demonstrating that SACs students exhibited high critical reading self-efficacy skills.

In the study, independent samples t-test was conducted to determine the response to "Is there a significant difference between the critical reading self-efficacy levels of SAC' students based on grade" research question. The findings are presented in Table 3.

Table 3. Critical reading self-efficacy level based on grade

Grade	N	\bar{x}	S	sd	t	p
5th	137	72.12	11.78	297	0.26	.80
6th	162	71.78	10.47			

As seen in Table 3, there were no significant differences between the critical reading self-efficacy levels of the students based on grade ($p=.80 > .05$). It could be suggested that there was no significant difference between the critical reading levels of BYF 1 students attending the 5th grade and the BYF 2 students attending the 6th grade.

To test the research problem that "Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on gender," independent samples t-test was conducted. The findings are presented in Table 4.

Table 4. Critical reading self-efficacy level based on gender

Gender	N	\bar{x}	S	sd	t	p
Female	138	73.11	10.55	297	1.71	.90
Male	161	70.93	11.44			

As seen in Table 4, the mean score of the female students ($\bar{x}=73.11$) was higher than the mean score of the male students ($\bar{x}=70.93$); however, the difference was not statistically significant ($p=.90 > .05$). In other words, the gender variable was not effective in the critical reading self-efficacy skills of BİLSEM students.

The next research question was "Is there a significant difference between the critical reading self-efficacy levels of BİLSEM students based on household income?" To test this problem, one-way analysis of variance (One-Way ANOVA) was conducted. The findings are presented in Tables 5 and 6.

Table 5. Household income descriptive statistics

Household income (TL-monthly)	N	\bar{x}	SS
15.000 or lower	90	72.38	1.06
15.000-40.000	171	71.06	0.85
40.000 or higher	38	74.84	2.05

According to the table, the income level of most of the students is medium. The number of students with high income is at the lowest level.

Table 6. Critical reading self-efficacy level based on household income

Source of the variance	Sum of Squares	sd	Mean Squares	F	p
Inter-group	470.169	2	235.085	1.930	.147
Intra-group	36055.623	296	121.810		
Total	36525.793	298			

Analysis results demonstrated that there was no significant difference between the critical reading self-efficacy levels of the students based on household income ($F(2, 296)=1.930$; $p=0.147 > 0.05$). In other words, the critical reading self-efficacy level of the students was not affected by household income.

To respond to the next research question, "Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on parental education level," both the mother's and father's education levels were determined. To test this problem, one-way analysis of variance (One-Way ANOVA) was conducted. The findings are presented in Tables 7, 8, 9 and 10.

Table 7. Descriptive statistic for maternal education level

Maternal Education Level	N	\bar{x}	ss
Primary School	9	72.00	9.46
Junior High School	10	71.50	11.56
High School	59	71.17	11.39
Undergraduate	151	72.13	11.69
Graduate	50	72.88	10.22
PhD	20	70.55	8.42

Table 8. Critical reading self-efficacy based on maternal education level

Source of the variance	Sum of Squares	sd	Mean Squares	F	p
Inter-group	125.407	5	25.081	0.202	.692
Intra-group	36400.386	293	124.233		
Total	36525.793	298			

Analysis results demonstrated that there was no significant difference between the critical reading self-efficacy levels of the students based on maternal education level ($F(5,293)=0.202$; $p=0.692 > 0.05$). In other words, the critical reading self-efficacy level of the students was not affected by the maternal education level.

Table 9. Descriptive statistic for paternal education level

Maternal Education Level	N	\bar{x}	ss
Primary School	10	70.20	13.88
Junior High School	12	74.25	9.53
High School	37	74.92	7.98
Undergraduate	166	70.71	11.83
Graduate	57	71.46	9.75
PhD	17	74.18	9.81

Table 10. Critical reading self-efficacy based on paternal education level

Source of the variance	Sum of Squares	sd	Mean Squares	F	p
Inter-group	1236.454	5	307.291	2.573	.432
Intra-group	34989.338	293	119.418		
Total	36525.793	298			

Analysis results demonstrated that there was no significant difference between the critical reading self-efficacy levels of the students based on paternal education level ($F_{(5,293)}=2.573$; $p=0.432 > 0.05$). In other words, the critical reading self-efficacy level of the students was not affected by the paternal education level.

The next research question was "Is there a significant difference between the critical reading self-efficacy levels of SACs' students based on library ownership?" This problem was tested with the independent samples t-test. The findings are presented in Table 11.

Table 11. Critical reading self-efficacy based on library ownership

Library Ownership	N	\bar{x}	S	sd	t
Yes	265	72.59	10.83	297	2.90
No	34	66.82	11.73		

As seen in Table 11, there was a significant difference between the critical reading self-efficacy levels of the students based on library ownership ($t_{(297)}=2.90$; $p=.00 < .05$). The mean scores of library owners ($\bar{x}=72.59$) was higher than the mean score of those who did not ($\bar{x}=66.82$). This finding demonstrated that students who owned a library had higher critical reading self-efficacy when compared to those who did not.

Another research question was the following: "Is there a significant correlation between the daily reading time and critical reading self-efficacy skills of SACs students?" To test this problem, one-way analysis of variance (One-Way ANOVA) was conducted. The findings are presented in Tables 12 and 13.

Table 12. Descriptive statistics for daily reading time

Daily Reading	N	\bar{x}	SS
I do not read daily (I)	10	60.10	8.75
10-30 min (II)	123	70.52	10.94
30 min-1 hour (III)	130	73.38	9.98
1 hour or more (IV)	36	74.86	13.27

Table 13. Critical reading self-efficacy level based on daily reading

Source of the variance	Sum of Squares	sd	Mean Squares	F	p
Inter-group	2225.357	3	741.786	6.380	.000
Intra-group	34300.436	295	116.273		I between
Total	36525.793	298			II-III-IV

As seen in Table 13, there was a significant difference between the critical reading self-efficacy level of the students based on daily reading time ($F(3,295)=6.380$; $p=000<.05$). The difference was between the students who did not read daily and students who read for 10-30 minutes, 30 minutes-1 hour, and 1 hour or more daily. The mean scores of the students who read for 10-30 minutes daily ($\bar{x}=70.52$), who read for 30 minutes-1 hour ($\bar{x}=73.38$), and who read for 1 hour or more ($\bar{x}=74.86$) were higher when compared to the students who did not read daily ($\bar{x}=60.10$), and the differences were statistically significant. In other words, the critical reading self-efficacy levels of students who read for a certain period every day were higher than students who did not read daily.

The types of books read by SACs' students are presented in Table 14.

Table 14. The types of books read by SACs' students

Book Type	f	%
I do not read	2	0.66
Literature	32	10.70
History	37	12.37
Science	69	23.07
Arts	25	8.36
Science-fiction	171	57.19
Others	112	37.46

As seen in the table, SACs' students mostly read science fiction books (57.19%), followed by science (23.07%), history (12.37%), literature (10.70%), and art books (8.36%).

Conclusion and Discussion

The present study aimed to determine the omit critical reading self-efficacy levels of SACs' students and the effects of certain variables on critical reading self-efficacy level. The maximum score possible in the critical reading self-efficacy scale was 95. The mean critical reading self-efficacy score was $\bar{x}=71.94$. In the present study, it could be suggested that the critical reading self-efficacy levels of gifted students was high. In the limited number of studies on critical reading skills of the students, only two included gifted students. These two studies were conducted by Ogurlu (2014) and Kilic (2019). The critical reading skills of gifted students were investigated, and it was reported that the critical reading skills of gifted students were high (Ogurlu, 2014). In the studies conducted on students with typical development, Guven and Aktas (2014) reported that the critical reading skills of 5th grade students were high, while most studies conducted on students with typical development reported that the critical reading skills of the students were moderate (Ozdemir, 2017; Unal, 2006; Demir and Kan, 2017; Akar, Basaran and Kara, 2016). Based on the findings reported in the present study and the study conducted by Ogurlu (2014) and Kilic (2019), it could be suggested that the critical reading skills of gifted students were higher when compared to the students with typical development. Certain studies reported that reading attitudes were higher among gifted students when compared to the students with typical development (Ley & Trentham, 1987; Anderson, Tollefson & Gilbert, 1985). This could be explained by certain factors such as the

development of the reading habit at an early age among gifted students, their curiosity towards learning, and their desire for research. These factors could lead them to exhibit positive attitudes towards reading, improving their reading skills.

In the study, no significant difference was determined between the critical reading self-efficacy levels of the students based on grade (RIT1 and RIT2). No previous study was conducted to determine the variations between the critical reading skills of gifted students based on grade. In a study conducted by Ozmutlu et al. (2014) on students with typical development, it was reported that there was no significant difference between critical reading skills based on grade. However, other studies reported contradicting findings. A study conducted by Yalinkilic and Celik (2011) on the critical reading skills of 6th, 7th and 8th grade students reported that the critical reading skills of 6th and 7th grade students were higher when compared to 8th grade students. The sample included 5th and 6th graders in the present study. These students attend 6 hours of Turkish language course at the school. Since the weekly course hours were similar, the students could have developed similar critical reading self-efficacy skills.

In the present study, the effect of the gender variable on critical reading self-efficacy skills was also investigated. The data revealed that gender did not affect the critical reading self-efficacy level. No similar study was conducted with gifted students. However, previous studies were conducted on students with typical development. The studies conducted by Yayli and Ulper (2011), Gunduz (2015), Emiroglu (2014), Altunsoz (2016) and Ozdemir (2017) reported that the gender variable did not affect the critical reading skills. However, other studies in the literature reported higher critical reading skills for female students (Güven & Aktaş, 2014; Yalinkilic & Celik, 2011; Ozmutlu et al., 2014).

In this study, the impact of household income and parental education level on critical reading self-efficacy level was also investigated. The study findings demonstrated that these did not affect the critical reading self-efficacy of the students. This finding was consistent with previous reports on students with typical development (Sadioglu & Bilgin, 2008; Gunduz, 2015; Kilic, 2019). However, certain studies reported that critical reading skills increased with the increase in household income (Güven & Aktaş, 2014; Inan, 2005).

In the study, the effect of library ownership on critical reading self-efficacy level was also addressed. The findings demonstrated that students who owned a library scored higher in the critical reading self-efficacy scale. Library ownership would ensure the number of books that the student could read regularly and positively affect the critical reading self-efficacy skills. Gifted students should have access to a variety of reading material during education to develop their potential (Kilic, 2019).

It was also observed in the present study that students who read a book every day for a certain period of time had higher critical reading self-efficacy skills when compared to the students who do not read daily. Thus, there was a correlation between the habit of reading and critical reading self-efficacy. Critical reading skills reflect the highest level of literacy (Ozdemir, 2009). An individual should make reading a habit to improve critical reading skills. Because, in a study conducted by Ogurlu (2014), it was reported that reading improved critical reading skills of gifted students. Similar results were reported in studies conducted on students with typical development (Ozdemir, 2017; Güven & Aktaş, 2014; Ozmutlu et al., 2014; Orhan, 2007).

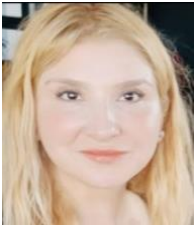
Finally, the types of books that gifted students read was investigated in the study. It was observed that students preferred science fiction and scientific books the most. In a study conducted by Ogurlu (2014), it was reported that gifted students read predominantly science fiction and fantasy books. Previous studies reported that reading science fiction and fantasy books was popular among gifted students (Swanton, 1984; Halsted, 1988; Larsen, 1999). The self-perception, perceptions about the environment and the world of the student are directly associated with critical reading skills. Thus, critical reading should not be reduced to a class activity or reading time. Critical literacy is about world perception and interaction with the world, and it describes the desires and dexterity that an individual acquires in the analysis of the society and the world as an ordinary part of one's life (Ateş, 2013). Currently, critical reading skills and acquisition of these skills are extremely important for the students. Based on the present study findings, the following could be recommended:

- Critical reading workshops should be organized for gifted students in Science and Arts Centers. These courses should provide complex, difficult and visual texts for the students when compared to their peers.

- The value and urgency of critical reading in science should be recognized and the studies in the field should not be limited to social sciences (Literature, Philosophy, History, etc.). The proliferation of interdisciplinary texts and discussions for gifted students would contribute to the cognitive and intellectual development of these students.

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