



## **Pre-service EFL Teachers' Perceptions Regarding Their Critical Reading Self-Efficacy and Cognitive Flexibility**

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### **ABSTRACT**

*This paper aims to study the possible relations between critical reading self-efficacy and cognitive flexibility among pre-service EFL instructors. Designed as descriptive research, this study was conducted with 121 participants from a state university in western Turkey. The data were gathered through Likert scales and the analysis was conducted on SPSS packet program through the tests of Kruskal-Wallis, Mann-Whitney U, Pearson correlation as well as frequencies and percentages. The results have revealed that the pre-service EFL teachers' critical reading self-efficacy scores are high, whereas their cognitive flexibility scores are partially high. Also, there is a weak but positive relationship between the pre-service teachers' critical reading self-efficacy and cognitive flexibility. However, there is no meaningful difference between their critical reading self-efficacy or cognitive flexibility regarding their gender or the grade they are studying in.*

**Keywords:** *Cognitive flexibility, critical reading self-efficacy, pre-service EFL teachers*

### **INTRODUCTION**

A growing number of educators, politicians and business leaders believe that students of our age need to be equipped with 21<sup>st</sup>-century skills to succeed in the new world. The term, 21<sup>st</sup>-century skills, has dominated the modern world, and it refers to what students should be able to do with their skills rather than what they should know; thus, students' performance has gained prominence over their cumulative knowledge (McComas, 2014). The need for knowledge and skills like information literacy and critical reading has always existed, and the idea of such skills dates to Plato's time when he mentioned the four levels of intellect (Rotherham & Willingham, 2012).

Following the technological advances and the constant processes that globalization has brought about, teachers have taken on new roles to achieve 21<sup>st</sup>-century goals in education. Accordingly, some organizations like the International Reading Association (2001) and the North Central Regional Educational Laboratory (NCREL, 2003) are focusing on the development of effective educational frameworks that are compatible with the requirements of

this new era and the new level of literacy within this new century (Black, 2011). Accordingly, teachers are expected to deliver content and the necessary skills in this new era. In addition to delivering the content and the skills to help learners acquire 21<sup>st</sup>-century skills, EFL teachers should also teach critical thinking, critical reading, cooperation, collaboration, and problem-solving skills to all students, in addition to some core skills.

As a requirement of this century, the EFL curricular activities must be aligned with the critical pedagogy; thus, any educational activity should be designed to further the knowledge of language learners so that learners' understanding of the topics can be extended (Edwards & Mercer, 1987). To this end, the crucial question must be about the 'feasibility of growth in knowledge and understanding' (Wallace, 2003, p. 49). To deepen the learning and understanding of language learners, critical thinking and critical reading lie at the heart of education and pedagogical activities, particularly in developing the ability to read (Wilson, 2016). Since reading underpins a considerable portion of language learning, language learners, EFL teachers, and practitioners must begin reading and thinking critically. In this respect, many tertiary languages and literacy practitioners stress the necessity of establishing a critical approach to reading (Bharuthram, 2012; Chanock, Horton, Reedman, & Stephenson, 2012; Devereux & Wilson, 2008). Teachers are extremely important in fostering the critical reading abilities that are taught as part of the curriculum. To teach critical reading to their students, EFL teachers need to be proficient readers who can identify these qualities. Determining the level of critical reading knowledge and skills that pre-service teachers have acquired as well as their teacher preparation is therefore crucial.

Critical thinking and students' self-efficacy perceptions have been studied in various contexts (Best, Floyd & Mcnamara, 2008; Thomas, Yao, Wright & Kreiner, 2019), and the significance of critical thinking has also been emphasized in Turkish curricula prepared by the Ministry of National Education in 2006 (MoNE, 2020). In accordance with the curriculum, students are expected to be able to differentiate between facts and opinions, draw conclusions from their reading, make inferences, identify the author's purpose and point of view, identify any prejudices, and be willing to read in order to become effective critical readers. To do so, it is significant for students to have these competencies. In terms of critical reading, students' self-efficacy beliefs play their role in achieving pedagogical purposes since the beliefs and assumptions of students about themselves are fundamental forces that shape their academic success or failure in educational contexts (Pajares, 2010).

This study seeks to determine whether there is a significant association between the critical reading self-efficacy and cognitive flexibility of pre-service EFL teachers. To do this, the current study aims to provide answers to the following research questions:

1. How do the pre-service EFL teachers perceive their critical reading self-efficacy?
2. How do the pre-service EFL teachers perceive their cognitive flexibility?
3. Is there a significant relationship between their critical reading self-efficacy and cognitive flexibility?
4. Does their critical reading self-efficacy or cognitive flexibility vary significantly regarding their gender or grade?

## LITERATURE REVIEW

### Critical Reading Self-Efficacy

Critical reading (CR, henceforth) has taken an important place within educational research and language teaching pedagogies for a long time, although it has been referred to as a new skill in the 21<sup>st</sup> century. Critical reading originates from the essence of critical reviews to understand written materials (Freire & Macedo, 1987). CR has been defined differently by different scholars. For instance, Schwegler (2004) defines CR as an active reading activity on the readers' part. Poulson and Wallace (2004) maintain that CR requires the readers to keep an open mind. Milan (1995), on the other hand, argues that CR requires readers to maintain objectivity and refrain from allowing their expectations or personal prejudices as they might interfere in understanding reading materials. Regarding all these definitions of CR, it is essential to state that readers' background experiences and knowledge to form criteria and judge the value of the target reading material play their role in critical reading (De Boer, 1946).

The improvement of higher-order thinking abilities must be stressed in reading education in accordance with the standards of CR (Barnett & Bedau, 2017; Collins, 1993; Paul & Elder, 2008; Zabihi & Pordel, 2011). Reading entails conversation between the reader and the text by nature (Rumelhart, 1994), and throughout this process, different experiences such as background knowledge, language skills, cognitive sources and world knowledge come to the fore. Indeed, critical readers are those who can switch to the most effective reading strategies efficiently (Tıkız-Ertürk, 2019). As Anderson (2003) also points out, effective readers can combine cognitive, metacognitive, and metalinguistic reading skills. Thus, CR is inherently linked to critical thinking skills as learners are supposed to be involved in various processes to the extent that they can make definitions of concepts, interpret ideas that take place in reading materials and perceive the knowledge through a critical lens in making sense of arguments, criticizing others, and stating their points of view (Mayfield, 1997; Medina & Pilonieta, 2006). Critical reading activities in language teaching has some crucial implications as critical reading is a desirable goal in pedagogy. Effective critical readers have strategies that enhance their critical thinking skills (Walker & Finney, 1999).

Perceived self-efficacy, according to Bandura (1997), is the belief that a learner has in their ability to finish a certain activity. These views have been linked to learners' cognitions, motivations, effective processes, and subsequent behaviours. Efficacy beliefs play a significant role in governing behaviours that lead to human competence (Pintrich, 1999; Pintrich & De Groot, 1990); thus, when students are expected to perform higher-order skills like critical reading or academic writing, their self-efficacy beliefs will play a significant role since students' self-efficacy beliefs regarding their skills and task performance are influenced by their understanding about their capabilities (Schunk, 1991). Students must possess critical reading skills (Cervetti & Damico, 2001) and a sense of self-efficacy to engage in critical reading in order to evaluate reading texts (Kaplan, 2021) objectively.

The self-efficacy of teachers and students in critical reading has been extensively studied. A study by Karabay, Kayran, and Işık (2015) examined teachers' perceptions of their sense of self-efficacy in critical reading to ascertain the extent of that sense of self-efficacy and to determine whether that sense of self-efficacy demonstrated a significant change regarding some variables. The findings revealed that pre-service teachers felt competent in critical reading at a level above intermediate, and that their self-efficacy views varied by gender and graduate degree. In contrast, Küçüköğlü (2013) sought to examine the reading self-efficacy levels of EFL instructors and its relationship to some variables like gender, teaching experience, and

department of graduation. The results, however, did not indicate a significant relationship between the variables and the participants' comprehension of critical reading.

Some scholars have also investigated learners' self-efficacy beliefs concerning critical reading. In their study of two self-efficacy scales, one of which measured reading self-efficacy, Prat-Sala and Retford (2012) focused on the function of self-efficacy. Data was gathered from freshman and sophomore students in a British college and the researchers came to the conclusion that pre-service teachers' beliefs in their reading self-efficacy were related to their overall performance. They also emphasized the idea of self-efficacy regarding student performance. The relationship between reading comprehension level, reading strategy use, and reading self-efficacy beliefs among Iranian EFL students was also studied by Naseri and Zaferanieh (2012). Their research revealed a considerable and strong positive correlation between reading comprehension and reading strategy use and opinions of one's own reading abilities.

### **Cognitive Flexibility**

Human cognition is characterized by flexibility (Boroditsky, Neville, Karns, Markman & Spivey, 2010). There are various definitions of cognitive flexibility. The phrase was initially used by Spiro and Jehng (1990) to describe the capacity to adaptively reassemble various components of information to suit the specific requirements of a given understanding or problem-solving situation. Çelikkaleli (2014), on the other hand, describes it as an attribute one has when s/he knows there are various options and accessible alternatives to every situation and that s/he can adapt to various situations. According to Caas, Quesada, Antoli, and Fajardo (2003), cognitive flexibility is the capacity of a person to adapt cognitive processing techniques when confronted with novel or unexpected situations. In light of this, some consider cognitive flexibility to be a particular cognitive trait or ability, whereas it is considered a property of different cognitive mechanisms or a property of the cognition (Ionescu, 2012). However, as Ionescu (2012) points out, a thorough understanding of cognitive flexibility as a phenomenon has not been achieved and accordingly, there are still multiple interpretations of cognitive flexibility as a cognitive construct.

Spiro, Feltovich, Jacobson and Coulson (1991) emphasize the addition of a new component called constructive processing into the flexible use of the pre-existing knowledge as an outgrowth of Cognitive Flexibility Theory, and thus they refer to cognitive flexibility as inherently constructivist. Accordingly, in attaining advanced instructional goals, a learner must surpass the information given so that a new understanding is constructed rather than achieved by using prior information; thus, it requires great flexibility. Hence, the same material must be revisited at different times, from different angles, in varying contexts, and content must be covered at different times and intervals to achieve complete understanding (Spiro, Coulson, Feltovich, & Anderson, 1988).

Cognitive flexibility requires any learner to be aware of appropriate options and possible alternatives and accordingly adapt to those conditions by voluntarily being flexible (Martin & Anderson, 1998). A learner who fails to be cognitively flexible might perform erroneously as s/he will act in a non-functional way in meeting situational demands (Cañas et al., 2006). Thus, an individual with cognitive flexibility is aware of the accessible options, has efficient problem-solving skills, acts flexibly in adapting to new situations, seeks multiple solutions to overcome problems and has strong interpersonal communication skills (Mustafaoğlu & Önen, 2016).

Cognitive flexibility has also been researched in different educational contexts. Saffarin and Fatemi (2015) collected information from a sample of 357 teachers and 1785 students in Iran to perform a study on the association between EFL learners' views about English language

learning. They discovered a strong connection between students' attitudes toward learning the English language and the teacher's cognitive flexibility. Likewise, Avarzamani and Farahian (2017) explored EFL learners' cognitive styles and flexibility with a sample of 60 adult EFL learners in an Iranian context. Their research concluded that successful EFL learners employed analytical thinking, logical reasoning, and reflective cognitive styles and showed considerable cognitive flexibility. In contrast, less successful learners tended to adopt a random style and a lower degree of cognitive flexibility. On the other hand, Khasawneh (2021) investigated the relationship between several characteristics and the cognitive flexibility of students with learning impairments. According to the findings, there were statistically significant differences by gender, favouring men, and by school grade, favouring second primary grades.

## METHODOLOGY

### Research Design

This descriptive study employs a quantitative data collection technique and a correlational survey model. To describe, contrast, categorize, analyse, and interpret the entities and events that comprise their varied fields of investigation, descriptive studies concentrate on the people, groups, institutions, methods, and materials. (Cohen, Manion & Morrison, 2005, p. 169). Without using any sort of treatment, intervention, or manipulation. This study aims to describe how pre-service EFL teachers view their capacity for critical reading and cognitive flexibility. A correlational design is also used to find any meaningful relationship between the variables mentioned above.

### Sampling

The data were collected from 121 pre-service EFL teachers from a state university in western Turkey during the 2017-2018 academic year. The detailed information regarding the participants' gender and grade is given in Table 1 below.

**Table 1.** Distribution of the Participants Regarding Gender and Grade

| <b>Variables</b> |                  | <b>n</b>   | <b>%</b>   |
|------------------|------------------|------------|------------|
| <b>Gender</b>    | <i>Female</i>    | 85         | 70         |
|                  | <i>Male</i>      | 36         | 30         |
| <b>Grade</b>     | <i>Freshman</i>  | 28         | 23         |
|                  | <i>Sophomore</i> | 31         | 26         |
|                  | <i>Junior</i>    | 34         | 28         |
|                  | <i>Senior</i>    | 28         | 23         |
| <b>Total</b>     |                  | <b>121</b> | <b>100</b> |

As seen in Table 1, 70% of the participants are female (n=85) and 30% are male (n=36). 28% of the participants were enrolled in the first grade (n=23) whereas 31% were sophomores (n=26). In addition, 34% were juniors (n=28) and 28% were seniors (n=23).

### Data Collection Instruments

Within the body of this study, the *Critical Reading Perceptions of Self-Efficacy Scale* developed by Karadeniz (2014) was utilized to collect data about the participants' critical reading perceptions and *the Cognitive Flexibility Scale* by Çelikkaleli (2014) was exploited to reveal their self-perceptions regarding cognitive flexibility in addition to a short background questionnaire to get information about their gender and grade.

First, *the Critical Reading Perceptions of Self-Efficacy Scale (CRPSES)* is a 5-point Likert scale which consists of 33 items. The scale includes eight negative items and five sub-dimensions: inquiry, analysis, evaluation, finding similarities and differences, and illation. The participants were asked to express how much they agreed or disagreed with the items on a scale from 1= I strongly disagree to 5= I strongly agree. The Cronbach Alfa Coefficient varies between .79 and .86 for the sub-dimensions, whereas it is .93 for the total scale. Therefore, it can be considered a reliable data collection tool.

Second, *the Cognitive Flexibility Scale (CFS)* is a 6-point Likert scale. There are 12 items on the one-dimension scale. The participants were asked to express how much they agreed or disagreed with the items in the scale as follows: 1= I strongly disagree, 2= I disagree, 3=I partially disagree, 4= I partially agree, 5= I agree and 6= I strongly agree. The Cronbach Alfa Coefficient is .74, which shows that CFS is also a reliable tool for collecting data.

### Data Analysis

The data were analysed with SPSS 22 packet program. Firstly, the data distribution was checked since the normality is a prerequisite to performing some statistical tests and the normal distribution of the data is an underlying assumption for performing the parametric tests (Mishra, Pandey, Singh, Gupa, Sahu & Keshri, 2019). Shapiro-Wilk test is used to test normality when the sample size is smaller than 50 (<50 samples), whereas the Kolmogorov-Smirnov test is a more appropriate method when the sample size is larger than 50 (121 samples) (Mishra et al., 2019). Accordingly, One-Sample Kolmogorov-Smirnov Test was conducted to test the normality of the data from both scales within the body of the present study. The results of the normality tests are presented in Table 2 below.

**Table 2.** Results for One-Sample Kolmogorov-Smirnov Test

| Values                      |           | Critical Reading Perceptions of<br>Self-Efficacy Scale | Cognitive Flexibility<br>Scale |
|-----------------------------|-----------|--|--------------------------------|
| <b>N</b>                    |           | 121  | 121                            |
| <b>Normal Parameters</b>    | $\bar{x}$ | 3.98   | 4.05                           |
|                             | ss        | .340   | .354                           |
| <b>Kolmogorov-Smirnov Z</b> |           | .109   | .098                           |
| <b>p</b>                    |           | .00  | .00                            |

p>.05

Since the data did not follow a normal distribution, as shown in Table 2, non-parametric tests had to be used in the study (p=.00). Therefore, the Mann Whitney-U test was used to assess the participants' opinions of their gender-related cognitive flexibility and self-efficacy in critical reading. In addition, Kruskal Wallis Test was used to evaluate their perceptions of their critical reading self-efficacy and cognitive flexibility regarding their grade. To determine if their evaluations of critical reading self-efficacy and cognitive flexibility were related, the Pearson Correlation Coefficient test was used. Also, means ( $\bar{x}$ ), frequencies (f) and percentages (%) were calculated for all the variables. In the analysis, the findings were considered statistically significant at p<.05.

## RESULTS

The results of the statistical analysis of the quantitative data are presented in this section. To make this section more reader-friendly, the results are given under five subtitles formed following the research questions.

### Findings Regarding the Pre-Service English Teachers' Critical Reading Self-Efficacy

Firstly, the study aimed to shed light on the pre-service EFL teachers' opinions of their critical self-efficacy. The means and standard deviations for the Critical Reading Perceptions of Self-Efficacy Scale were calculated for that purpose. The results are presented in Table 3 below.

**Table 3.** Means for the Critical Reading Perceptions of Self-Efficacy Scale

| Variables                                   | <i>N</i> | Mean | Sd     |
|---|----------|------|--------|
| <b>Inquiry</b>                              | 121      | 3.91 | .41091 |
| <b>Analysis</b>                             | 121      | 4.04 | .40139 |
| <b>Evaluation</b>                           | 121      | 4.07 | .42812 |
| <b>Finding similarities and differences</b> | 121      | 4.05 | .44682 |
| <b>Illation</b>                             | 121      | 3.87 | .48041 |
| <b>CRPSE</b>                                | 121      | 3.98 | .34065 |

As shown in Table 3, the mean score for the Critical Reading Perceptions of Self-Efficacy Scale is 3.98 overall. In addition, the mean score is the highest for the evaluation dimension ( $\bar{x}=4.07$ ), whereas it is the lowest for illation ( $\bar{x}=3.87$ ). The mean score for other sub-dimensions are as follows: inquiry ( $\bar{x}=3.91$ ), analysis ( $\bar{x}=4.04$ ), and finding similarities and differences ( $\bar{x}=4.05$ ). The pre-service EFL teachers find themselves most efficient in evaluating, analysing, and finding similarities and differences, whereas they have lower self-efficacy in illation and inquiry. In brief, it is understood that the participants perceive themselves as quite efficient critical readers.

### Findings Regarding the Pre-Service English Teachers' Critical Reading Self-Efficacy in Terms of Their Gender

Second, the Mann-Whitney-U test was performed to determine if the participants' critical reading self-efficacy levels vary significantly regarding their gender. The findings of the analysis are displayed in Table 4.

**Table 4.** Results of the Mann Whitney-U Test for Critical Reading Self-Efficacy and Gender

| Variables      | Groups | <i>N</i> | Mean Rank | Sum of Ranks | <i>U</i> | <i>z</i> | <i>p</i> |
|----------------|--------|----------|-----------|--------------|----------|----------|----------|
| <b>Inquiry</b> | Female | 85       | 60.91     | 5177.50      | 1522.50  | -.04     | .96      |
|                | Male   | 36       | 61.21     | 2203.50      |          |          |          |

|   |        |     |       |         |         |       |      |
|---|--------|-----|-------|---------|---------|-------|------|
|   | Total  | 121 |       |         |         |       |      |
| <b>Analysis</b>                             | Female | 85  | 65.59 | 5575.50 |         |       |      |
|   | Male   | 36  | 50.15 | 1805.50 | 1139.50 | -2.23 | .02* |
|   | Total  | 121 |       |         |         |       |      |
| <b>Evaluation</b>                           | Female | 85  | 64.48 | 5480.50 |         |       |      |
|   | Male   | 36  | 52.79 | 1900.50 | 1234.50 | -1.69 | .09  |
|   | Total  | 121 |       |         |         |       |      |
| <b>Finding similarities and differences</b> | Female | 85  | 61.22 | 5204.00 |         |       |      |
|   | Male   | 36  | 60.47 | 2177.00 | 1511.00 | -.10  | .91  |
|   | Total  | 121 |       |         |         |       |      |
| <b>Illation</b>                             | Female | 85  | 61.06 | 5190.00 |         |       |      |
|   | Male   | 36  | 60.86 | 2191.00 | 1525.00 | -.02  | .97  |
|   | Total  | 121 |       |         |         |       |      |
| <b>CRPSE</b>                                | Female | 85  | 63.69 | 5414.00 |         |       |      |
|   | Male   | 36  | 54.64 | 1967.00 | 1301.00 | -1.29 | .19  |
|   | Total  | 121 |       |         |         |       |      |

p<.05

As demonstrated in Table 4, the participant pre-service teachers' gender creates no significant difference in their critical reading self-efficacy levels ( $p=.19$ ). Moreover, when the sub-dimensions are considered, it is seen that there is a statistically significant difference only for their self-efficacy in analysis ( $p=.02$ ), whereas no meaningful difference is observed for inquiry ( $p=.96$ ), finding similarities and differences ( $p=.91$ ) or illation ( $p=.97$ ). Given the mean results, it is reasonable to draw the conclusion that the female participants have greater levels of analytical self-efficacy ( $x=65.59$ ) than the male pre-service teachers ( $x=50.15$ ). While not statistically significant, the remaining sub-dimensions and the overall scale show a similar difference in favour of the female pre-service teachers.

### Findings Regarding the Pre-Service English Teachers' Critical Reading Self-Efficacy in Terms of Their Grade

Third, the Kruskal Wallis test was used to see if there was a significant relationship between the participants' critical reading self-efficacy levels and their grades. The findings of the analysis are given in Table 5.

**Table 5.** Results of the Kruskal-Wallis Test for Critical Reading Self-Efficacy and Grade

| Variables       | Groups    | N  | Mean Rank | X <sup>2</sup> | df | p   |
|-----------------|-----------|----|-----------|----------------|----|-----|
| <b>Inquiry</b>  | Freshman  | 28 | 68.77     |                |    |     |
|                 | Sophomore | 31 | 67.87     | 5.39           | 3  | .14 |
|                 | Junior    | 34 | 51.66     |                |    |     |
|                 | Senior    | 28 | 56.96     |                |    |     |
| <b>Analysis</b> | Freshman  | 28 | 50.27     |                |    |     |
|                 | Sophomore | 31 | 66.44     | 4.37           | 3  | .22 |
|                 | Junior    | 34 | 59.71     |                |    |     |
|                 | Senior    | 28 | 67.29     |                |    |     |

|   |           |    |       |      |   |     |
|---|-----------|----|-------|------|---|-----|
| <b>Evaluation</b>                           | Freshman  | 28 | 53.89 | 3.91 | 3 | .27 |
|   | Sophomore | 31 | 68.81 |      |   |     |
|   | Junior    | 34 | 64.60 |      |   |     |
|   | Senior    | 28 | 55.09 |      |   |     |
| <b>Finding similarities and differences</b> | Freshman  | 28 | 63.21 | .44  | 3 | .93 |
|   | Sophomore | 31 | 62.94 |      |   |     |
|   | Junior    | 34 | 59.74 |      |   |     |
|   | Senior    | 28 | 58.18 |      |   |     |
| <b>Illation</b>                             | Freshman  | 28 | 58.93 | 5.21 | 3 | .15 |
|   | Sophomore | 31 | 69.48 |      |   |     |
|   | Junior    | 34 | 64.26 |      |   |     |
|   | Senior    | 28 | 49.71 |      |   |     |
| <b>CRPSE</b>                                | Freshman  | 28 | 59.95 | 1.68 | 3 | .63 |
|   | Sophomore | 31 | 67.82 |      |   |     |
|   | Junior    | 34 | 59.00 |      |   |     |
|   | Senior    | 28 | 56.93 |      |   |     |

$p < .05$

As shown in Table 5, the critical reading self-efficacy levels of the EFL pre-service teachers do not significantly differ according to their grades for the overall scale ( $p = .63$ ) or any of the sub-dimensions: inquiry ( $p = .14$ ), analysis ( $p = .22$ ), evaluation ( $p = .27$ ), finding similarities and differences ( $p = .93$ ), and illation ( $p = .15$ ). However, when the mean scores are considered, it is seen that the sophomores perceive themselves as more efficient in critical reading regarding all the dimensions, even though this difference is not statistically meaningful.

### Findings Regarding the Pre-Service English Teachers' Cognitive Flexibility

Another objective of the study was to uncover the pre-service EFL teachers' perceptions of their cognitive flexibility. The mean and standard deviation for the Cognitive Flexibility Scale were calculated for that purpose. Table 6 below displays the findings.

**Table 6.** Means for the Cognitive Flexibility Scale

| Variable                           | <i>N</i> | Mean | sd     |
|------------------------------------|----------|------|--------|
| <b>Cognitive Flexibility Scale</b> | 121      | 4.05 | .35420 |

As seen in Table 6, the mean score for pre-service EFL teachers' perceptions of their cognitive flexibility is partially high ( $\bar{x} = 4.05$ ), which corresponds to 'I partially agree' on the scale. This suggests that the pre-service EFL teachers have the opinion that they are cognitively flexible.

### Findings Regarding the Pre-Service English Teachers' Cognitive Flexibility in Terms of Their Gender

Next, the Mann-Whitney-U test was performed to determine if the participants' perceived cognitive flexibility levels vary significantly regarding their gender. The findings of the analysis are displayed in Table 7 below.

**Table 7.** Results of the Mann Whitney-U Test for Cognitive Flexibility and Gender

| Variables | Groups | N   | Mean Rank | Sum of Ranks | U       | z    | p   |
|-----------|--------|-----|-----------|--------------|---------|------|-----|
| CFS       | Female | 85  | 59.41     | 5049.50      | 1394.50 | -.53 | .59 |
|           | Male   | 36  | 63.16     | 2210.50      |         |      |     |
|           | Total  | 121 |           |              |         |      |     |

$p < .05$

As understood in Table 7, the pre-service EFL teachers' perceptions of their cognitive flexibility do not show any significant difference ( $p = .59$ ) by gender. However, it is also possible to conclude that the male participants perceive themselves as cognitively more flexible ( $\bar{x} = 63.16$ ) than the female pre-service teachers ( $\bar{x} = 59.41$ ), despite the fact that this slight difference is not statistically significant.

### Findings Regarding the Pre-Service English Teachers' Cognitive Flexibility in Terms of Their Grade

Then, the Kruskal Wallis test was performed to determine if the participants' cognitive flexibility levels varied significantly regarding their grades. The findings of the analysis are given in Table 8.

**Table 8.** Results of the Kruskal-Wallis Test for Cognitive Flexibility and Grade

| Variables | Groups    | N  | Mean Rank | X <sup>2</sup> | df | p   |
|-----------|-----------|----|-----------|----------------|----|-----|
| CFS       | Freshman  | 28 | 56.14     | .64            | 3  | .88 |
|           | Sophomore | 31 | 63.15     |                |    |     |
|           | Junior    | 34 | 61.01     |                |    |     |
|           | Senior    | 28 | 61.33     |                |    |     |

$p < .05$

As shown in Table 6, the EFL pre-service teachers' perceived cognitive flexibility level does not vary significantly regarding their grades ( $p = .88$ ). However, when the mean scores are considered, it is seen that the sophomores think that they have a slightly more flexible cognition ( $\bar{x} = 63.15$ ) than the freshmen ( $\bar{x} = 56.14$ ), juniors ( $\bar{x} = 61.01$ ) and seniors ( $\bar{x} = 61.33$ ) even though these differences are not statistically meaningful.

### Findings Regarding the Pre-Service English Teachers' Critical Reading Self-Efficacy concerning Their Cognitive Flexibility

Finally, this study aimed to reveal any possible relation between the pre-service EFL teachers' perceived critical reading self-efficacy and cognitive flexibility. The Pearson Correlation test was conducted with this purpose in mind, and the findings are presented in Table 9 below.

**Table 9.** The results of the Pearson Correlation Test for Critical Reading Self-Efficacy and Cognitive Flexibility

| <i>Critical Reading Perceptions of Self-Efficacy Scale</i> | <i>Cognitive Flexibility Scale</i> |          |          |
|--|------------------------------------|----------|----------|
|  | <i>N</i>                           | <i>r</i> | <i>p</i> |
| <b>Inquiry</b>   | 121                                | .31      | .00*     |

|   |     |      |
|---|-----|------|
| <b>Analysis</b>                             | .16 | .06  |
| <b>Evaluation</b>                           | .16 | .20  |
| <b>Finding similarities and differences</b> | .08 | .37  |
| <b>Illation</b>                             | .20 | .02* |
| <b>Total</b>                                | .24 | .00* |

$p < .05$

As shown in Table 9, the analysis has revealed a significant relationship between the pre-service EFL teachers' critical reading self-efficacy and cognitive flexibility ( $p = .00$ ), suggesting a weak but positive correlation between the critical reading self-efficacy scores and cognitive flexibility scores ( $r = .24$ ). As the pre-service EFL teachers' critical reading self-efficacy scores increase, their cognitive flexibility scores also increase. Likewise, there is a weak but positive and significant correlation between their cognitive flexibility and their self-efficacy in inquiry ( $p = .00$ ,  $r = .31$ ) and illation ( $p = .02$ ,  $r = .20$ ). In contrast, it does not correlate significantly with their self-efficacy in analysis ( $p = .06$ ), evaluation ( $p = .20$ ) or finding similarities and differences ( $p = .37$ ).

### CONCLUSION, DISCUSSION AND RECOMMENDATIONS

The current study explores the pre-service EFL teachers' perceptions of their critical reading self-efficacy and cognitive flexibility and identifies any potential significant relationships between the two variables. Below is a summary of the findings obtained from the analysis, the discussion, and some practical recommendations.

First, this study has shown that the pre-service EFL teachers perceive themselves as quite efficient critical readers, and they feel most efficient in evaluating, analyzing, and finding similarities and differences. In contrast, they have relatively lower self-efficacy in illation and inquiry. There are various studies in the literature also show that pre-service teachers tend to have high levels of critical reading self-efficacy (Alan & Yamaç, 2021; Karabay, Kayıran & Işık, 2015). For instance, Topçuoğlu-Ünal and Sever (2013) found that the pre-service Turkish teachers had high perceptions of critical reading. Second, the pre-service English teachers believe that they have partially high cognitive flexibility, which is also consistent with the findings of other studies in the literature (Bilgiç & Bilgin, 2016; Asıcı & İkiz, 2015; Zuhail, 2014). Third, the participants' critical reading self-efficacy does not differ significantly regarding their gender. This finding is also parallel with the literature since various studies have found no significant difference in critical reading self-efficacy scores regarding the pre-service teachers' gender (Akdere, 2010; Çam-Aktaş, 2016; Gündüz, 2015; Topçuoğlu-Ünal & Sever, 2013; Güven & Acar, Başaran & Kara, 2006).

In contrast to the male pre-service teachers, the results of this study showed that the female participants had a higher level of self-efficacy. Likewise, this study has concluded that the participants' cognitive flexibility scores do not vary significantly regarding their gender. The finding is aligned with the results of the study by Soylu and Özkan (2021), whereas the literature presents contradictory conclusions as well (Esen-Aygün, 2018; Öztürk, Karamete, & Çetin, 2020). Fourth, the participants' critical reading self-efficacy and cognitive flexibility do not vary significantly regarding their grades. However, the sophomores seem to perceive themselves as more efficient in critical reading and cognitively flexible than the first-year, third-year student and senior participants. Finally, this study has shown a weak but positive and significant relationship between the critical reading self-efficacy and cognitive flexibility scores

of pre-service English teachers. This finding makes sense since CR requires the readers to keep an open mind (Poulson & Wallace, 2004) and perceive the knowledge through a critical lens in making sense of arguments, criticizing others, and stating their points of view (Mayfield, 1997; Medina & Pilonieta, 2006). Therefore, it is possible to argue that cognitive flexibility lets learners be aware of appropriate options and possible alternatives and accordingly adapt to the current conditions by voluntarily being flexible (Martin & Anderson, 1998). Consequently, a higher level of cognitive flexibility might result in higher critical reading self-efficacy.

All things considered, it is clear that cognitive flexibility and critical reading self-efficacy are important and connected learning concepts for pre-service language teachers. In addition, various factors like gender or educational grade might determine levels of critical reading self-efficacy or cognitive flexibility among pre-service teachers. Therefore, making the following recommendations based on these conclusions is possible. First, this is a quantitative study with a correlational research methodology. Further research in which qualitative data collection procedures are utilized or which adapt an experimental design can be conducted to deepen the understanding of these two constructs. Second, this study has investigated critical reading self-efficacy and cognitive flexibility concerning gender and grade among pre-service EFL teachers. So, it is recommended to conduct further research focusing on these constructs in terms of other variables with different participants and contexts.

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