

Research Article

The Correlation between Metacognition, Self-correction, and Writing Learning Outcomes of Students in the German Language Study Program

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Abstract.

As one of the productive skills in learning a foreign language, writing plays a significant role in supporting the development of other language skills. To enhance writing skills, it is essential to have the ability to self-assess. This study aims to examine the correlation between metacognition and self-correction in relation to the writing learning outcomes of students enrolled in the German Language Education study program, while also assessing their capacity for self-correction in their writing skills. The research employed a correlational design, using a pre- and post-test nonequivalent control group approach. The sample consists of students enrolled in writing courses, selected through proportional sampling. Data collection involves the administration of tests, questionnaires, and interviews. The findings reveal a significant correlation between self-correction, metacognition, and writing learning outcomes among students in the German Language Education study program. The pretest Mean score was 56.9, while the post-test Mean score showed improvement at 72.6, indicating a difference of 15.7. Furthermore, the calculated correlation coefficient ($r = 0.686$) exceeds the tabulated correlation coefficient ($r = 0.553$). Comparing the results of students' self-correction in the pre-test and post-test with the lecturer's correction, an increase in self-correction ability was observed. In conclusion, this research contributed in enhancing German writing skills among students in the German Language Education study program.

Keywords: German language, learning outcomes, metacognition, self-correction, writing

1. Introduction

In today's era, it is imperative to equip students with the necessary skills to thrive in the global workforce, spanning local, national, and international domains. Consequently, contemporary learning approaches must prioritize student-centered methodologies. By harnessing their existing knowledge and assimilating new knowledge during the learning process, students can cultivate their metacognitive abilities and proactively engage in independent learning pursuits

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Metacognition plays a vital role in learning by enabling individuals to effectively organize and regulate their acquired knowledge through thoughtful reflection. The possession of metacognition empowers learners to navigate their educational journey with greater success, as they can strategically manage their understanding and identify areas for improvement by cultivating new thinking skills, ultimately leading to enhanced learning outcomes [1]. At its core, metacognitive skills encompass the ability to learn how to learn and to think about thinking [2]. Fundamentally, metacognition serves as a tool for individuals to refine their cognitive processes, guiding their thoughts and actions in alignment with task demands. Moreover, metacognition fosters self-awareness of one's cognitive functioning, thus contributing to the development of an individual's character [3]. Students who possess metacognitive knowledge are empowered to take agency over their learning, resulting in a more effective learning experience [2].

Metacognition serves as a pathway to foster critical thinking by providing individuals with the capacity to regulate their cognition, also known as metacognitive control [4]. It encompasses two key components: metacognitive knowledge, which pertains to students' awareness of their cognitive abilities, and metacognitive experience, which involves the deployment of metacognitive strategies for cognitive regulation [5]. Metacognitive strategies are a series of deliberate processes employed to govern cognitive activities and ensure the attainment of cognitive goals. These processes encompass the planning, monitoring, and evaluation of cognitive activities and their outcomes. Cultivating metacognitive intelligence is essential for every student and individual, as it equips them with the necessary skills to navigate their learning journey effectively [6].

Learning outcomes encompass three domains: the cognitive domain, which pertains to the development of intellectual abilities and thinking skills; the psychomotor domain, which relates to motor skills and physical movements; and the affective domain, which focuses on the cultivation of students' attitudes and emotions [5]. These outcomes manifest as a result of the learning process undertaken by students. In the context of cognitive learning outcomes, which are applicable to all forms of learning, including writing as a productive skill in German, metacognition plays a crucial role. Students with strong metacognitive abilities possess an awareness of their learning process, the capacity to gauge problem difficulty, the ability to monitor their level of comprehension, the skill to utilize information to achieve goals, and the aptitude to evaluate their own learning progress [3]. Learning outcomes serve as the ultimate goal of the learning process, and favorable outcomes are indicative of a well-executed learning journey [7].

They represent the overall achievements of students, serving as markers of competence and the extent of behavioral change [5].

Writing skills hold a significant position as they enhance cognitive abilities and foster creativity in articulating ideas. Writing encompasses various dimensions, including intellectual improvement, creative expression, confidence building, stimulus provision, and information acquisition [8]. Writing skills encompass diverse forms of written expression, such as short essays, instructions, letters, announcements, dialogues, forms, speeches, reports, summaries, paraphrases, and literary works [9]. Writing is an active and productive language activity, often considered challenging even for native speakers, as it involves the transfer of ideas or thoughts into written language [10]. Mastering writing is widely acknowledged as the most demanding language skill [11].

The challenges associated with writing skills are also apparent within the German Language Education study program. Through interviews conducted with students, it became evident that writing in German poses significant difficulties. Students frequently encounter errors in content, grammar, vocabulary, and other aspects of their written work. Writing is inherently complex, as it allows for the potential occurrence of numerous mistakes (*Schreiben ist schwer, weil man viele Fehler machen kann*). Learning to write proficiently in a new language is an endeavor that is not devoid of obstacles [13]. Nonetheless, writing remains an engaging activity that offers students several advantages. Despite the inherent difficulties, writing serves as a valuable, indispensable, integrated, and enjoyable component of foreign language lessons [14].

Engaging in self-correction fosters self-reflection, cultivating students' independence and sense of responsibility. This practice not only helps them concentrate on their learning but also guides them in the process of reflection, which significantly contributes to the construction of their knowledge [15]. In the context of writing, several previous studies have established a positive correlation between self-correction and achieving favorable writing outcomes. For instance, Assis in Alkhowarizmi and Hamdani discovered that students who engage in self-assessment exhibit greater autonomy and responsibility, thereby encouraging them to assume a proactive role in their work. To promote students' self-reliance in their personal development, it is imperative to reform the existing testing methods and empower students accordingly [17]. Self-assessment, which entails the ability to identify strengths, weaknesses, and areas for improvement in one's own performance, plays a pivotal role in this process [18].

However, in reality, students often rely on their lecturers to correct their writing mistakes. This dependence stems from a tendency among students to underestimate their own knowledge and capabilities. They perceive the assessments conducted by

teachers as more trustworthy and reliable. When teachers fail to offer opportunities for students to actively participate in the learning process, students frequently find themselves overly dependent on their teachers, which hinders their progress in improving their performance, particularly in writing skills [18].

Undoubtedly, self-correction can be particularly beneficial for students who struggle academically. It empowers them to identify and rectify errors by utilizing available metalinguistic cues. This process not only enhances their confidence but also facilitates self-assessment when comparing the results of their writing corrections. Students gain a deeper understanding of their strengths and weaknesses in writing. Simultaneously, lecturers have the opportunity to gain insights into individual students' abilities through the application of this technique. By recognizing recurring errors in student work, lecturers can provide targeted interventions to mitigate these issues effectively [19]. Self-correction serves as a means for students to independently rectify their own mistakes [20]. Moreover, the practice of self-correction has long-lasting effects on students' cognitive processes, as it actively engages them and activates necessary cognitive operations over an extended period. Through self-correction, students gradually acquire accurate writing skills, including proper punctuation, capitalization, and sentence structure [21]. It is important to note that self-correction functions as a form of indirect feedback, wherein lecturers present students with choices that enable them to discern the correct form independently [22].

2. Method

This research employed a quantitative approach with a correlational research design, specifically aimed at assessing the degree of correlation between variables. The correlation was determined using the correlation coefficient. The study was conducted within the German Language Education Study Program, commencing in the academic year 2023/2024, spanning from September to November 2023.

The target population for this research comprised all students enrolled in the German language education study program. The sample consisted of 3rd semester students who were taking courses focused on productive skills, particularly writing. Data collection involved administering pre-tests and post-tests to students based on their respective proficiency levels, followed by a questionnaire to further support the investigation of metacognition and self-correction. The questionnaire utilized a combination of closed and open-ended questions. The research instrument employed was a test, assessing students' writing performance relative to their semester level, where students were

instructed to write according to provided guidelines. Additionally, a questionnaire containing statements related to metacognition and self-correction was utilized.

The research procedure involved an initial stage where students underwent a pre-test to identify errors in a given written text and completed the questionnaire. Subsequently, students received an explanation of the writing model test. Finally, a post-test was administered to assess the outcomes of the treatment. The analysis employed encompassed correlation analysis to test the proposed research hypotheses, descriptive statistical analysis to portray the data from all variables, and inferential analysis utilizing the product-moment correlation to investigate the relationship between metacognition, self-correction, and student writing learning outcomes. The statistical software SPSS 16 was employed for data analysis.

3. Result and Discussion

3.1. Result

The research findings are presented based on the learning process steps that were undertaken. The assessment utilized in this study focused on writing skills. Specifically, it followed the A2 level German writing test model, which involved composing short messages and emails. The evaluation criteria aligned with the assessment model employed by the Goethe Institute. Analysis of the pretest results revealed an average score of 56.9, while the average posttest score increased to 72.6, indicating a difference of 15.7 points. As per the assessment criteria guidelines, during the pretest, 69.2% of students did not achieve the target score, while 30.8% met the target. In contrast, after the posttest, 84.2% of students had reached the target score, while 15.8% had not. The results obtained from the individual correction sheets completed by each student are as follows:

TABLE 1: Pretest Results of Writing Assessment.

| Nu | Respondent | Score | Student self-correction | Lecturer's correction |
|----|------------|-------|---|---|
| 1 | BD | 52 | Orthographie (punctuation; capitalization <i>leid=Leid</i>); diction <i>nehmen</i> ; conjugation <i>haben</i> ; preposition <i>von</i> | Ortographie (punctuation; capitalization <i>leid=Leid</i>); diction <i>nehmen</i> ; conjugation <i>haben</i> ; preposition <i>von</i> ; diction <i>ich momentan</i> , the content is incorrect |
| 2 | DM | 30 | no name included in the closing greeting | Orthography (punctuation, capitalization, spelling); diction, grammar, Not according to instructions, part 2 closing greetings, |

TABLE 1: Pretest Results of Writing Assessment.

| Nu | Respondent | Score | Student self-correction | Lecturer's correction |
|----|------------|-------|---|--|
| 3 | EN | 55 | Orthography (punctuation) preposition zur; conjuntion aber | Orthography (punctuation, capitalization, leid=Leid, Freue=freue, Herzliche= herzlichen); ejaan durffen=dürfen, ab=ob, verb sein; preposition in=am; the use of Future tense werden; |
| 4 | EF | 50 | Orthography (punctuation, writing wrong words (zpät = spät, könne = können) | Orthography (punctuation, capitalization (zpät = spät, könne = können, srheib= schreib); the content is incorrect |
| 5 | KS | 73 | Orthography (capitalization ordnung = Ordnung, sie= Sie, punctuation) | Orthography (capitalization ordnung = Ordnung, sie= Sie, punctuation); double greetings; the use of reflexive; foreign words cafeteria |
| 6 | MN | 50 | Ortographie (punklich must be punktlich, biss must be bis, bein must be beim verb fahren) addition of preposition beim | Ortographie (placement of punctuation , capitalization Es=es punklich = punktlich, biss = bis, bein=beim, geehrte=geehrter, beschreiben= beschreiben, Grüss, Grüsse) addition of preposition beim, placement of verb with conjuntion weil; possessive Dativ |
| 7 | MT | 45 | Sentence formation; sentence choice | Orthography (capitalization , punctuation (leid=Leid, Freue=freue, aber=Aber; Ejaan Ich wuns du sischeinigen) grammar (placement of verb) ; no closing greeting |
| 8 | NI | 55 | Ortographie (punctuation, ; capitalization Bald=bald, ihnen= Ihnen; spelling Herrn= Herr) placement of subject | Double greetings, Ortographie (punctuation, ; capitalization Bald=bald, ihnen= Ihnen, Antworten= antworte; spelling Herrn= Herr) placement of subject diction; sentences choice; declination; closing greeting) |
| 9 | ST | 62 | Ortographie (capitalization später = Später, Spät=spät sie= Sie, punctuation; spelling das=dass, Fruher=Früher) | Ortographie (capitalization später = Später, Spät=spät sie= Sie, leid=Leid, bitte =Bitte, bescheid= Bescheid, mit Herzlichen= Mit herzlichen; punctuation; spelling das=dass, Fruher=Früher, wer=Weg); preposition an=im; perfekt form haben eingeladen; verb placement werden; infinitive zu; |
| 10 | SF | 54 | Ortographie (punctuation, capitalization ich=Ich, ort=Ort, weg= Weg); verb placement, conjuntion weil; closing greetings to a more respected person (bis bald = Herzliche Grüsse, additional subject) | Ortographie (punctuation, capitalization ich=Ich, ort=Ort, weg= Weg, geehrte = geehrter, antwort=Antwort); diction trend=fremd) verb placement, conjuntion weil weil; additional subject wir, closing greetings to a more respected person (bis bald = Herzliche Grüsse) |
| 11 | TK | 78 | Ortographie (spelling Antwort=Antwort; punctuation; capitalization sie=Sie) the use of posesiv pronomen, use of article Akkusativ, diction Feier=Platz) | Ortographie (spelling Antwort=Antwort; punctuation; capitalization sie=Sie, Bald=bald, Herzlichen= herzlichen); Use of posesiv pronomen, use of article Akkusativ, diction Feier=Platz), use of preposition in= an; word addition damit; verb of accusative infomieren Sie |

TABLE 1: Pretest Results of Writing Assessment.

| Nu | Respondent | Score | Student self-correction | Lecturer's correction |
|----|------------|-------|---|---|
| 12 | VC | 80 | Ortographie (punctuation, capitalization grüss=Grüss); word placement gern; diction sein=sind | Ortographie (punctuation, capitalization grüss= Grüss, bis= Bis, mit=Mit); word placement gern; diction sein=sind |
| 13 | YF | 55 | punctuation, capitalization (Entschuldigung) | Ortographie (spelling: wen must be wenn, punctuation, capitalization Für must be für, grammar with sein, conjunction aber too much) |

3.2. Self-Correction and Writing Learning outcomes

The normality test employed in this study was the Kolmogorov-Smirnov test, utilized to assess the distribution of residual values. Its purpose was to determine whether the residuals followed a normal distribution or deviated from it. The decision-making criterion was based on the significance value: a significance value >0.05 indicated that the residuals were normally distributed, while a significance value <0.05 indicated non-normal distribution. The results of the data normality test are as follows:

Based on the statistical analysis conducted using SPSS, the significance value $0.200 > 0.05$. Hence, it can be inferred that the residual self-correction value and student writing outcomes exhibit a normal distribution. Moving forward, a linearity test was conducted to examine the presence of a linear relationship between the two variables. In this research, the linearity test was performed using the SPSS program, obtaining the following results:

The results indicate that the Deviation from Linearity between students' self-correction and writing outcomes yields a significance value of 0.981. The value of $0.981 > 0.05$, signifying a linear relationship within the data. To determine the relationship between self-correction and writing results, the Product Moment correlation was employed utilizing the SPSS software. This analytical technique aims to assess the degree of proximity between variables, as denoted by the correlation coefficient (r). The decision-making criterion is as follows: a significance value <0.05 indicates correlation, while a significance value >0.05 suggests the absence of correlation. For information on the degree of relationship, refer to the table provided below:

The results of correlation calculations using the SPSS are as follows:

The results indicate that the significance value for the relationship between self-correction and writing outcomes is $0.026 < 0.05$. The calculated correlation coefficient ($r_{\text{count}} = 0.614$) exceeds the critical correlation value ($r_{\text{table}} = 0.553$), leading

TABLE 2: Posttest Result of Writing Assessment.

| Nu | Respondent | Score | Students Self Correction Results | Lecture's Correction Results |
|-----|------------|-------|--|---|
| 1. | BD | 65 | Verb placement, capitalization letter receiver; verb conjugation of erklären with modal verb | Ortographie (capitalization Wir=wir); word placement komme; letter receiver; verb conjugation of erklären |
| 2. | DM | 45 | Ortographie (spelling weill=weil, Grosse=Grüsse) verb placement komme; letter receiver | Ortographie (capitalization Spät=spät; spelling weill=weil, Grosse=Grüsse); verb placement komme; penerima surat; verb conjugation of erklären ; use of Sie-Form; content |
| 3. | EN | 72 | Ortographie (capitalization zeit=Zeit, Ich=ich, uhr=Uhr, Kommen=kommen) | Ortographie (capitalization zeit=Zeit, Ich=ich, uhr=Uhr, Kommen=kommen, hättest=Hättest; Use of Sie-Form |
| 4. | EF | 50 | Ortographie (capitalization krankenhaus=Krankenhaus; spelling werd=werde ; letter receiver | Ortographie (punctuation, capitalization krankenhaus= Krankenhaus; ejaan werd=werde); letter receiver; content |
| 5. | KS | 94 | Diction | Punctuation, spelling alleine=allein |
| 6. | EN | 70 | Verb placement, spelling ween=wenn | Punctuation, spelling ween=wenn, punklich= pünktlich,; capitalization bescheid= Bescheid; deklination, Article |
| 7. | MT | 60 | Verb placement; capitalization letter receiver; verb conjugation erklären with modal verb | Ortographie (capitalization Wir=wir); verb placement komme; letter receiver; verb conjugation erklären |
| 8. | NI | 78 | Ortographie (punctuation; capitalization grüss=Grüss); verb placement; diction sein=sind | Ortographie (punctuation; capitalization grüss= Grüss, bis= Bis, mit=Mit); verb placement; diction sein=sind |
| 9. | ST | 88 | Capitalization Pünktlich= pünktlich, Für=für, Herzlichen= herzlichen; spelling kaput= kaput; umlaut; punctuation | Capitalization Pünktlich= pünktlich, Für=für, Herzlichen= herzlichen; spelling kaput= kaput; umlaut; punctuation, double expressions |
| 10. | SF | 64 | Sentence choice, Capitalization dank=Dank, word gern, verb sein, diction neu | Sentence choice, Capitalization dank=Dank, word <i>gern</i> , verb <i>sein</i> , diction neu, content , closing greeting |
| 11. | TK | 90 | Capitalization uhr=Uhr; reflexive Verben | Capitalization uhr=Uhr; reflexive Verben, punctuation, use of article, diction |
| 12. | VC | 92 | Name spelling, Capitalization herzlichen=Herzlichen | Name spelling, Capitalization herzlichen= Herzlichen; diction |
| 13. | YF | 76 | Capitalization entschuldigung = Entschuldigung, Für=für; spelling wen=wenn | Capitalization entschuldigung = Entschuldigung, Für=für; spelling wen=wenn, kome= kommen, Auf=auf Artikel Akkusativ, use of perfekt |

TABLE 3:

| | | |
|--|----------------|-------------------------|
| | | Unstandardized Residual |
| N | | 13 |
| Normal Parameters ^{a,b} | Mean | ,0000000 |
| | Std. Deviation | 12,45436695 |
| Most Extreme Differences | Absolute | ,159 |
| | Positive | ,159 |
| | Negative | -,133 |
| Test Statistic | | ,159 |
| Asymp. Sig. (2-tailed) | | ,200 ^{c,d} |
| a. Test distribution is Normal. | | |
| b. Calculated from data. | | |
| c. Lilliefors Significance Correction. | | |
| d. This is a lower bound of the true significance. | | |

TABLE 4:

| ANOVA Table | | | | | | | |
|-------------|----------------|--------------------------|-------------|-------|-------------|-------|------|
| | | | Sum Squares | of df | Mean Square | F | Sig. |
| Y * X | Between Groups | (Combined) | 1535,910 | 8 | 191,989 | ,530 | ,794 |
| | | Linearity | 1123,742 | 1 | 1123,742 | 3,102 | ,153 |
| | | Deviation from Linearity | 412,168 | 7 | 58,881 | ,163 | ,981 |
| | | Within Groups | 1449,167 | 4 | 362,292 | | |
| | | Total | 2985,077 | 12 | | | |

TABLE 5:

| Score | Explanation |
|--|-------------------------|
| Value of Pearson Correlation 0,00 s/d 0,20 | There is no correlation |
| Value of Pearson Correlation 0,21 s/d 0,40 | Correlation is weak |
| Value of Pearson Correlation 0,41 s/d 0,60 | Correlation is medium |
| Value of Pearson Correlation 0,61 s/d 0,80 | Correlation is strong |
| Value of Pearson Correlation 0,81 s/d 1,00 | Correlation is perfect |

to the conclusion that a correlation exists between self-correction and student writing outcomes. Furthermore, when considering the guidelines for assessing the degree of correlation, the Pearson Correlation value of 0.614 falls within the category of strong correlation.

TABLE 6:

| | | Correlations | |
|---|---------------------|--------------|-------|
| | | X | Y |
| X | Pearson Correlation | 1 | ,614* |
| | Sig. (2-tailed) | | ,026 |
| | N | 13 | 13 |
| Y | Pearson Correlation | ,614* | 1 |
| | Sig. (2-tailed) | ,026 | |
| | N | 13 | 13 |

*. Correlation is significant at the 0.05 level (2-tailed).

To determine the extent to which self-correction contributes to writing outcomes, the coefficient of determination test is performed using the formula $r \times r \times 100\% = 0.614 \times 100\% = 37.7\%$. By substituting the values, we find that self-correction accounts for 37.7% of the improvement in writing results, while the remaining 62.3% is influenced by other factors.

3.3. Metacognition and Writing Outcomes

In this study, the normality test employed is the Kolmogorov-Smirnov normality test, which serves to assess the normal distribution of residual values. The decision-making criterion relies on the significance value: if the significance value > 0.05 , it indicates a normally distributed residual; conversely, if the significance value < 0.05 , it suggests a departure from normal distribution. The results of the data normality test are summarized as follows:

Based on the SPSS analysis, the obtained significance value is $0.160 > 0.05$. Therefore, it can be concluded that the residual values of metacognition with respect to writing outcomes exhibit a normal distribution. To further explore the relationship between the two variables, a linearity test was conducted. The purpose of this test is to determine whether a linear relationship exists between the variables. The analysis yielded the following results for the metacognitive linearity test with writing outcomes:

The linearity test table above shows that the Deviation from Linearity of metacognition and writing outcomes has a significance value of 0.268. The value is $0.268 > 0.05$, so it can be said that the data is linear. The results of correlation calculations using SPSS are as follows:

From the results above, the significance value for the correlation between metacognition and writing outcomes is $0.025 < 0.05$, then $r_{count} = 0.616$ is higher than $r_{table} =$

TABLE 7:

| One-Sample Kolmogorov-Smirnov Test | | |
|--|----------------|-------------------------|
| | | Unstandardized Residual |
| N | | 13 |
| Normal Parameters ^{a,b} | Mean | ,0000000 |
| | Std. Deviation | 12,42884837 |
| Most Extreme Differences | Absolute | ,160 |
| | Positive | ,160 |
| | Negative | -,155 |
| Test Statistic | | ,160 |
| Asymp. Sig. (2-tailed) | | ,200 ^{c,d} |
| a. Test distribution is Normal. | | |
| b. Calculated from data. | | |
| c. Lilliefors Significance Correction. | | |
| d. This is a lower bound of the true significance. | | |

TABLE 8:

| ANOVA Table | | | | | | | |
|---------------|----------------|--------------------------|-------------|-------|-------------|-------|------|
| | | | Sum Squares | of df | Mean Square | F | Sig. |
| Y * X2 | Between Groups | (Combined) | 2398,410 | 7 | 342,630 | 2,920 | ,128 |
| | | Linearity | 1131,362 | 1 | 1131,362 | 9,642 | ,027 |
| | | Deviation from Linearity | 1267,049 | 6 | 211,175 | 1,800 | ,268 |
| Within Groups | | | 586,667 | 5 | 117,333 | | |
| Total | | | 2985,077 | 12 | | | |

TABLE 9:

| Correlations | | | |
|--------------|---------------------|-------|-------|
| | | X2 | Y |
| X2 | Pearson Correlation | 1 | ,616* |
| | Sig. (2-tailed) | | ,025 |
| | N | 13 | 13 |
| Y | Pearson Correlation | ,616* | 1 |
| | Sig. (2-tailed) | ,025 | |
| | N | 13 | 13 |

*. Correlation is significant at the 0.05 level (2-tailed).

0.553, so it can be concluded that there is a correlation between metacognition and

writing learning outcomes. Furthermore, compared with the guidelines for the degree of correlation, it can be concluded that the Pearson Correlation value of 0.616 is in the strong correlation category. The coefficient of determination test was carried out to determine how much metacognition contributes to learning achievement using the formula $r \times r \times 100\% = 0.616 \times 0.616 \times 100\% = 38\%$. It can be concluded that metacognition can increase learning achievement by 38% and the other 62% is influenced by other factors.

3.4. Self-Correction and Metacognition with Writing Learning Outcomes

The Kolmogorov-Smirnov normality test is employed to examine the distribution of residual values. The purpose is to determine whether the residuals follow a normal distribution or deviate from it. The decision criterion is as follows: if the significance value > 0.05 , it indicates that the residuals are normally distributed, whereas a significance value < 0.05 suggests a departure from normal distribution.

Based on the results of the normality test conducted on the data of the metacognition and self-correction variable in relation to writing outcomes, the following results were obtained:

TABLE 10:

| One-Sample Kolmogorov-Smirnov Test | | | | |
|--|----------------|---------------------|---------------------|---------------------|
| | | X1 | X2 | Y |
| N | | 13 | 13 | 13 |
| Normal Parameters ^{a,b} | Mean | 54,1538 | 61,3846 | 72,6154 |
| | Std. Deviation | 2,47811 | 5,48541 | 15,77201 |
| Most Extreme Differences | Absolute | ,140 | ,178 | ,143 |
| | Positive | ,140 | ,083 | ,088 |
| | Negative | -,091 | -,178 | -,143 |
| Test Statistic | | ,140 | ,178 | ,143 |
| Asymp. Sig. (2-tailed) | | ,200 ^{c,d} | ,200 ^{c,d} | ,200 ^{c,d} |
| a. Test distribution is Normal. | | | | |
| b. Calculated from data. | | | | |
| c. Lilliefors Significance Correction. | | | | |
| d. This is a lower bound of the true significance. | | | | |

To examine the correlation between Self Correction and Metacognition with Writing learning outcomes, a multiple correlation test was conducted with the assistance of

SPSS. This test aims to assess the strength and closeness of the relationship between two or more independent variables (X) and the dependent variable (Y). In this case, the independent variables are Self Correction (X1) and Metacognition (X2), while the dependent variable is the writing learning outcomes of students in the German language education study program (Y). The correlation calculations using SPSS yielded the following results:

TABLE 11:

| Model Summary ^b | | | | | | | | | | |
|-----------------------------------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|-------------|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | |
| | | | | | R Square Change | F Change | df1 | df2 | Sig. Change | F |
| 1 | ,686 ^a | ,471 | ,365 | 12,56532 | ,471 | 4,453 | 2 | 10 | ,041 | |
| a. Predictors: (Constant), X2, X1 | | | | | | | | | | |
| b. Dependent Variable: Y | | | | | | | | | | |

Based on the decision-making criteria, it can be inferred that there is a correlation between self-correction and metacognition, both simultaneously, with writing learning outcomes. The correlation coefficient value is 0.686. Furthermore, the coefficient values are matched with the guidelines for the degree of relationship. The degree of relationship between self-correction and metacognition variables and writing results is in the strong correlation category. Furthermore, if we compare it, we get $r_{count} = 0.686$ is higher than $r_{table} = 0.553$, so it can be concluded that there is a correlation between self-correction and metacognition with the writing learning outcomes of students in the German language education study program.

4. Discussion

Based on a comprehensive analysis of the aforementioned results, it becomes evident that students, during the pre-test phase, displayed a tendency for committing errors primarily within the orthographic domain, encompassing punctuation, capitalization, and spelling. In addition, several grammatical deficiencies were observed, such as erroneous verb placements, inappropriate prepositional usage, suboptimal word choice (diction), and various other linguistic inaccuracies. Furthermore, when considering the content aspect, a mere 30.71% of students adhered to the prescribed instructions.

Conversely, the post-test outcomes indicate a notable improvement in students' self-correction abilities, particularly with regard to content-related aspects. Impressively,

approximately 84% of students demonstrated an enhanced compliance with the provided instructions. However, despite this marked progress, persistent challenges were observed, particularly in areas such as capitalization, grammatical errors encompassing verb conjugation and placement, prepositions, and word choice (diction).

Comparatively assessing the pre-test results against the lecturer's corrections, a substantial disparity emerges. During the pre-test phase, numerous errors spanning orthographic, grammatical, and content-related dimensions were identified, deviating from the stipulated instructions. In contrast, the post-test results revealed a discernible reduction in the frequency of such errors across these domains.

Based on the statistical calculations, the correlation between self-correction and writing learning outcomes yielded a significance value of $0.026 < 0.05$. Additionally, the calculated correlation coefficient ($r_{\text{count}} = 0.614$) exceeds the critical value ($r_{\text{table}} = 0.553$). Therefore, it can be concluded that there is a statistically significant correlation between self-correction and students' writing learning outcomes.

Similarly, the correlation analysis between metacognition and writing learning outcomes resulted in a significance value of 0.025 , indicating a significant correlation. The correlation coefficient ($r_{\text{count}} = 0.616$) also surpasses the critical value ($r_{\text{table}} = 0.553$), substantiating the presence of a correlation between metacognition and writing learning outcomes.

Furthermore, based on the decision-making criteria, it can be inferred that there is a simultaneous correlation between self-correction and metacognition with writing learning outcomes. The correlation coefficient ($r_{\text{count}} = 0.686$) exceeds the critical value ($r_{\text{table}} = 0.553$), reinforcing the conclusion that there is a correlation between self-correction, metacognition, and the writing learning outcomes of students in the German language education study program. To further support these research findings, the questionnaire results indicate that students perceive metacognitive skills and self-correction habits as valuable tools for enhancing their writing proficiency. Students express that these skills foster creativity and instill confidence in their writing abilities.

5. Conclusion

The development of metacognitive skills and the cultivation of self-correction habits prove beneficial in fostering favorable writing learning outcomes for students enrolled in the German Language Education study program. Based on the research findings and subsequent analysis, it can be concluded that (1) there is correlation between

metacognition and the writing learning outcomes of students in the German Language Education study program. (2) There is a correlation between self-correction and the writing learning outcomes of students in the German Language Education study program. (3) There is correlation between metacognition and self-correction and the writing learning outcomes of German Language Education study program students simultaneously.

Moreover, an examination of the students' self-correction abilities after the post-test reveals noticeable improvement. Specifically, in terms of cognitive aspects, a limited number of students made errors in orthography, grammar, and content. In addition, students displayed a positive attitude towards self-correction, demonstrating self-confidence and reduced reliance on the lecturer for guidance.

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