

EXPLORING GRAMMAR, SELF-REGULATION, AND THE ROLE OF DIGITAL TECHNOLOGY IN GERMAN WRITING

Aceng Rahmat^{1*}, Anim Purwanto²

Universitas Negeri Jakarta¹²

Email: aceng.rahmat@unj.ac.id¹, animpurwanto1107@gmail.com²

ABSTRACT

Writing in German as a foreign language is often considered the most demanding productive skill for Indonesian learners, as it requires mastery of complex grammar, adequate vocabulary, and the ability to organize ideas coherently. This study aims to describe students' strategies, obstacles, and confidence levels in writing German texts, while also exploring the role of digital technology and lecturer guidance in this process. The study used a sequential mixed-methods approach, involving twenty-seven students who completed an online questionnaire containing ten open-ended questions and ten Likert-scale items. Quantitative data were analyzed descriptively, while qualitative data were analyzed thematically. The results showed that grammatical difficulties, particularly in determining articles and noun declensions, were the most dominant obstacle, followed by limited vocabulary and confusion about verb position in sentences. The majority of students relied on self-regulation strategies such as rereading texts and discussions with lecturers or peers, while almost all respondents utilized online translation tools and generative artificial intelligence to assist in their writing process. Writing confidence was moderate, with an average score of 2.70 on a scale of 4, lower than the average for vocabulary competence. These findings indicate the need for more systematic pedagogical interventions in grammar teaching, critical digital literacy towards artificial intelligence tools, and strengthening students' writing self-efficacy.

Keywords: *writing strategies; German as a foreign language; self-efficacy; translation technology*

INTRODUCTION

Writing is one of the four language skills required of foreign language learners, yet it is consistently considered the most complex skill to develop (Hyland, 2019). Unlike speaking, which can be supported by situational context and spontaneous responses, writing requires learners to consciously construct sentence structures, choose appropriate vocabulary, and organize ideas into coherent text without direct support from their interlocutors. In the context of learning German as a foreign language in Indonesia, these demands are even more demanding because the language has a grammatical system that is significantly different from Indonesian, particularly in aspects of noun declensions, case systems, grammatical gender, and verb position in sentences (Purwanto et al., 2026).

Various cross-linguistic studies have confirmed that the German case system and grammatical gender are among the most consistent sources of difficulty for foreign

language learners, regardless of their native language background. Baten (2019), using a longitudinal study of German learners, showed that mastery of the case system develops gradually, moving from marking argument position to marking the actual function of arguments, a process that requires time and repeated practice. Similarly, a study of Turkish learners found that confusion about determining when to use the nominative, accusative, dative, and genitive cases was a major recurring complaint in learner interviews. Grammatical gender is often seen as the single biggest obstacle to mastering the declension system, as learners must memorize the grammatical gender of each noun without a completely consistent pattern (Menzel, 2024).

On the other hand, the development of digital technology has fundamentally changed the landscape of foreign language writing learning (Yang & Zhang, 2026). The presence of machine translation tools like Google Translate and DeepL, as well as generative artificial intelligence tools like ChatGPT and Gemini, provides learners with easy access to instant translations, grammar corrections, and vocabulary suggestions. A review of the use of machine translation tools in foreign language education shows that Google Translate remains the most popular tool, followed by DeepL and ChatGPT, with learners using them primarily for reading comprehension, grammar checking, and writing assistance. However, overreliance on these tools has also reportedly raised concerns, particularly regarding decreased motivation for independent learning and the tools' inability to capture cultural nuances in texts.

German Language Education students, as future educators, are required to master not only technical writing skills but also metacognitive awareness of effective learning strategies and the ability to use assistive technology wisely (Purwanto et al., 2024). Unfortunately, a deep understanding of how students actually experience the German writing process, what strategies they naturally use, what obstacles they most commonly experience, and how they view the role of technology and lecturer guidance, is still relatively limited in empirical documentation within the context of German language higher education in Indonesia.

Based on these gaps, this study was designed to comprehensively describe students' experiences in writing German texts, by examining four main aspects: first, the cognitive and metacognitive strategies used by students before, during, and after the writing process; second, the most frequently encountered linguistic and psychological obstacles; third, the role of digital technology, particularly translation tools and generative artificial intelligence, in supporting or hindering the development of independent writing skills; and fourth, the level of student self-confidence and the contribution of lecturers' learning to the development of these writing competencies. Through a descriptive approach based on primary data from students, this study is expected to provide empirical contributions to the development of German writing teaching strategies that are more responsive to the real needs and challenges faced by students, while also providing pedagogical recommendations regarding the critical and responsible integration of digital technology in foreign language writing learning in higher education.

The urgency of this research is also based on the fact that most German Language Education students in Indonesia begin learning German without any prior knowledge at the secondary level, unlike English learners who are generally exposed to the language from an early age. This situation makes college the starting point for developing German writing habits and strategies. Therefore, a deep understanding of the strategies that naturally develop in students is crucial for designing targeted teaching interventions from

the early stages of learning, rather than simply remedial measures after errors become difficult to change habits.

METHOD

This study employed a descriptive approach with a sequential mixed-methods design, combining quantitative data in the form of Likert scale scores with qualitative data in the form of open-ended responses to obtain a more comprehensive picture of students' writing experiences in German. This approach was chosen because the research aimed not only to measure students' perceptions numerically but also to explore in-depth strategies, obstacles, and subjective experiences that cannot be fully captured through numerical data alone.

The research participants consisted of twenty-seven students of the German Language Education Study Program who were or had taken German writing courses. Based on demographic data, the participants were dominated by twenty-one female students and six male students, with the majority age range, namely twenty-three students, being in the eighteen to twenty-year age group, and the remainder being twenty-one to twenty-three years old. The selection of participants was carried out purposively by considering the students' direct involvement in German writing activities at the higher education level.

The research instrument, an online questionnaire compiled using Google Forms, consisted of two main sections. The first section contained ten open-ended questions exploring students' understanding of sentence structure, vocabulary selection strategies, pre-writing activities, obstacles encountered, strategies for overcoming errors, ways of developing ideas, writing motivation, the role of lecturers in learning, self-confidence, and the use of digital tools. The second section contained ten statements with a four-point Likert scale, ranging from one indicating the highest disagreement to four indicating the highest agreement. These questions measured students' self-perceptions of vocabulary mastery, sentence structure skills, understanding of sentence patterns, clarity of idea delivery, ability to vary sentences, habits of proofreading, writing confidence, use of digital applications, understanding of cultural context, and habits of discussing with friends while writing.

Data collection was carried out online by distributing the questionnaire link to students who met the participant criteria. Quantitative data from the Likert scale was analyzed using descriptive statistics in the form of the mean and standard deviation for each statement item, in order to map the aspects of writing ability that students felt were the strongest and weakest. Qualitative data from open-ended questions were analyzed through thematic analysis, which involves repeated reading of all responses, coding of recurring keywords and phrases, grouping codes into broader themes, and calculating the frequency of occurrence of themes to strengthen qualitative interpretations with simple quantitative evidence. Triangulation between quantitative and qualitative data was carried out to ensure consistency of findings, for example by comparing the mean score of writing confidence on a Likert scale with the themes of self-confidence that emerged in students' open answers.

Prior to data collection, students were informed about the purpose of the study and the confidentiality of their identities, as well as consent to use their responses solely for

academic purposes. Anonymity was maintained by not explicitly listing respondents' names on the questionnaire, so the responses quoted in the results section of this study are presented anonymously and cannot be traced back to specific individuals. To maintain the credibility of the thematic analysis, initial coding was repeated at two different reading periods to check the consistency of the researchers' interpretations of the generated thematic categories, a simple step that serves as an internal reliability check in small-scale qualitative data analysis such as this study.

RESULTS AND DISCUSSION

Student Self-Perception of Writing Ability Components

The results of a descriptive analysis of the ten Likert scale items show variations in students' self-perception levels regarding various components of German writing ability, with an overall mean of 2.93 on a four-point scale. Details of the mean and standard deviation for each item are presented in Table 1.

Table 1. Mean and Standard Deviation of Students' Self-Perception of Writing Ability Components

Statement Items	Average (M)	Standard Deviation (SD)
I have enough German vocabulary to write simple texts.	3.19	0.62
I am able to construct German sentences correctly.	2.74	0.66
I understand sentence patterns in German	2.96	0.59
I can convey ideas clearly in writing	2.81	0.62
I can make variations of sentences in writing	2.85	0.77
I always double check my writing before submitting it.	3.19	0.83
I am confident in writing German	2.70	0.61
I use digital apps to help me write.	2.89	0.58
I understand the cultural context in written German	2.89	0.70
I discuss with friends while writing	3.04	0.65

The data shows that the two aspects with the highest average scores, namely vocabulary sufficiency for writing simple texts and the habit of proofreading writing before submission, each obtained an average of 3.19. In contrast, the lowest average was found for the German writing confidence item with a score of 2.70, followed by the ability to construct sentences correctly with a score of 2.74. This pattern indicates a gap between students' perceptions of mastery of technical language components, such as vocabulary, and their general confidence in producing correct and confident writing. This finding is consistent with students' open-ended responses, in which many respondents stated that

they had a basic vocabulary but still felt uncertain when it came to constructing grammatically correct sentences.

Strategies for Understanding Sentence Structure and Vocabulary Selection

In answering open-ended questions about understanding sentence structure, the majority of students reported strategies oriented toward pattern recognition, particularly memorizing the position of verbs in second-place in declarative sentences and paying attention to the order of subjects, predicates, and objects. A number of respondents specifically mentioned the use of conjunctions such as *weil*, *dass*, and *obwohl* as markers that require verbs to move to the end of a sentence, indicating a fairly good metalinguistic awareness of German syntactic rules, although their application in free writing was not always consistent.

In terms of vocabulary selection, the most frequently reported strategies were the use of online dictionaries and adapting vocabulary to the theme or context of the writing being written. Some students, as expressed by one respondent, stated that vocabulary was selected by first understanding the context of the situation in the text, then adapting it to the writer's imagination and creativity. Another strategy that emerged was the tendency to use simple vocabulary learned in class to avoid errors, an avoidance strategy that, while safe, has the potential to limit the development of the complexity of students' writing in the long term.

Dominant Obstacles in Writing German

Thematic analysis of responses regarding writing challenges revealed that difficulty determining noun articles, *der*, *die*, and *das*, and their changes according to grammatical case, was the most frequently mentioned theme, appearing in eleven of the twenty-seven respondents. Verb-related challenges, including conjugation and sentence position, were mentioned by six respondents, while general vocabulary limitations were mentioned by seven respondents. More specific challenges related to the case system, such as the use of the accusative and dative after certain prepositions, were mentioned by two respondents, and general grammatical challenges without specific details were mentioned by four respondents. A summary of the frequency of themes regarding writing challenges, strategies for overcoming errors, and motivations for writing is presented in Table 2.

Table 2. Frequency of Qualitative Themes on Constraints, Strategies, Motivation, and the Role of Lecturers

Category	Theme	f	%
Writing difficulties	Difficulties with articles and case declensions (<i>der/die/das</i>)	11	41%
Writing difficulties	Limited vocabulary	7	26%
Writing difficulties	Verbs: conjugation and verb positions	6	22%
Writing difficulties	General grammar	4	15%
Writing difficulties	Specific case system (accusative/dative)	2	7%
Strategy for overcoming errors	Rereading the writing independently	9	33%

Category	Theme	f	%
Strategy for overcoming errors	Leveraging AI/translation tools for correction	8	30%
Strategy for overcoming errors	Ask the lecturer	5	19%
Strategy for overcoming errors	Ask a colleague	5	19%
Motivation to write	German is seen as unique and interesting	10	37%
Motivation to write	Want to improve your foreign language skills	7	26%
The role of lecturers in learning	Structured writing exercises	10	37%
The role of lecturers in learning	Clear and detailed grammar explanations	10	37%
The role of lecturers in learning	Providing examples of concrete sentences	4	15%
The role of lecturers in learning	Feedback/correction of errors	4	15%

Note: f = frequency of respondents mentioning the related theme; one respondent can mention more than one theme in one answer.

The data show that almost half of all respondents attributed their main difficulties to the article and declension systems, a much larger proportion than to any other challenge theme. Such a pattern of single dominance is relatively rare and so sharp, and suggests that among the complexities of German grammar, the article and case systems truly stand out as critical points that require their own pedagogical attention, rather than being treated on a par with other aspects of grammar in the teaching syllabus.

These findings reinforce a pattern widely documented in the literature on German as a foreign language acquisition, where grammatical gender and case declensions are consistently sources of difficulty across learners' native language backgrounds. One respondent explicitly described her confusion, stating that the main difficulty lies in determining the article of nouns and how to change it according to the accusative and dative case contexts, while another respondent expressed similar difficulties regarding the declension of adjectives, which must adjust their position in the sentence.

Strategies for Overcoming Errors and Developing Ideas

In addressing writing errors, the most frequently reported strategy was rereading one's writing independently to check for grammatical conformity, mentioned by nine respondents, nearly matched by the strategy of utilizing generative artificial intelligence or translation tools to correct sentences, mentioned by eight respondents. The social strategy of asking lecturers was mentioned by five respondents and asking colleagues was also mentioned by five respondents, indicating that social support, both vertical from lecturers and horizontal from friends, remains an important resource despite the increasing accessibility of digital technology.

In terms of idea development, students generally reported strategies rooted in personal experiences and everyday life as the primary source of inspiration, combined with developing a simple outline before writing complete sentences. Several respondents also mentioned the habit of first formulating ideas in Indonesian before translating them into German, a strategy that reflects the cognitive process of interlanguage transfer common among beginner to intermediate foreign language learners.

Writing Motivation and the Role of Lecturers in Learning

In terms of motivation, the most dominant theme was the perception that German has unique and interesting characteristics compared to other foreign languages previously studied, mentioned by ten respondents. A desire to improve general foreign language skills and communication skills was mentioned by seven respondents, while an interest in German culture and a desire to visit the country were mentioned by a small number of others.

Regarding the lecturer's learning role, the two most frequently mentioned themes, each by ten respondents, were providing structured writing exercises and providing clear and detailed grammar explanations. Providing concrete sentence examples and corrective feedback on writing errors were each mentioned by four respondents. These findings confirm that students highly value the combination of explicit explanations and opportunities for repeated practice, in line with the principle of contextual grammar learning, which combines explicit input with opportunities for active language production.

Use of Digital Tools and Level of Self-Confidence

Nearly all respondents, twenty-six out of twenty-seven students, reported using digital tools in their German writing process, with Google Translate and generative artificial intelligence tools like ChatGPT and Gemini being the most frequently mentioned, followed by DeepL. The majority of students reported that these tools helped them understand the meaning of new vocabulary and check sentence structure, but some respondents reflectively added cautionary notes, such as stating that these tools need to be used wisely so as not to hinder the development of independent thinking and sentence construction skills.

Regarding self-confidence levels, student responses showed wide variation, ranging from expressions of self-confidence percentages between fifty and ninety percent, to qualitative statements reflecting doubts, such as still being afraid of making mistakes or not having a strong foundation in German since secondary education. This pattern of responses is consistent with the average self-confidence score on the Likert scale which is at a moderate level, indicating that although students have developed a fairly diverse range of writing strategies, their confidence in the final product is still an area that needs further strengthening through repeated writing experiences and constructive feedback.

Interestingly, some students who reported high levels of self-confidence did not always attribute this to the absence of difficulty, but rather to an acceptance of mistakes as a natural part of the learning process. One respondent, for example, stated that his high self-confidence stemmed from a sense of competence despite occasionally making minor errors, while others who reported low self-confidence tended to attribute this to a lack of prior German language learning or a lack of confidence in their sentence structure. This

difference in attitudinal orientation, between viewing mistakes as part of the learning process versus viewing them as indicators of failure, indicates that writing confidence is not solely a function of objective proficiency but is also shaped by students' subjective mindsets and interpretations of their own learning experiences.

The findings of this study confirm that the most dominant obstacle in German writing for German Language Education students stems from the morphological complexity of the target language, particularly the article system and case declensions, a pattern consistent with a series of previous studies on German as a foreign language acquisition. The consistency of these findings across contexts, whether in learners from Turkish, Indonesian, or other languages without grammatical gender systems, strengthens the argument that these difficulties are structural and not solely due to students' lack of motivation or learning intensity.

The pattern of error-coping strategies found, in which independent rereading and the use of generative artificial intelligence are nearly equal in frequency, indicates a fundamental transformation in the ecology of foreign language writing learning among the current generation of students. This finding aligns with the results of a cross-country survey on the use of machine translation tools, which showed the dominance of Google Translate, followed by DeepL and ChatGPT as the primary tools for foreign language learners, and also confirms concerns expressed in the literature about the potential for over-reliance on these technologies. Several students in this study were explicitly aware of these risks, as reflected in statements emphasizing the need for caution in avoiding over-reliance on tools, so that independent thinking skills remain cultivated. This kind of metacognitive awareness is an important asset that can be further developed through critical digital literacy instruction, where lecturers do not prohibit the use of technology outright but instead guide students to use it as a tool for verification and learning, in line with recommendations put forward in studies on the integration of machine translation in foreign language education.

The gap between perceived relatively high vocabulary mastery and lower levels of writing confidence, as reflected in the Likert scale data, can be explained through Bandura (2023) self-efficacy framework, which emphasizes that confidence in one's abilities is not always linearly correlated with mastery of individual skill components, but rather is shaped by cumulative experiences of success in completing complex tasks as a whole. Students may feel they have sufficient vocabulary, but repeated experiences of encountering grammatical errors when composing sentences can erode their confidence in their final written work. This finding aligns with studies on the relationship between writing self-efficacy and anxiety in foreign language learners, which emphasize that confidence-boosting interventions cannot be conducted partially on a single skill component but need to target the full and ongoing writing experience, accompanied by constructive feedback from the instructor.

This pattern also aligns with Cheng et al. (2026) framework of foreign language writing anxiety and Tsui & Cheng (2022) findings on the inverse relationship between self-efficacy and writing anxiety. The statements of several respondents who openly stated that they were still afraid of making mistakes or felt they did not have a strong foundation in German since secondary education reflect the cognitive component of anxiety, namely the fear of negative evaluation, which if not handled proportionally has the potential to encourage avoidance behavior, for example by deliberately choosing simple, safe sentence structures even though students have actually learned more complex structures. Lecturers need to consciously create a writing classroom climate that

normalizes mistakes as a natural part of the learning process, as reflected in one student's answer that stated that mistakes are not the end, but rather part of the learning process itself, a reflective attitude that is actually a valuable psychological capital to be continuously strengthened through appropriate learning design.

The perceived helpfulness of lecturer feedback, particularly in the form of detailed grammar explanations and structured writing exercises, reinforces the relevance of Purwanto et al. (2026) feedback model and the empirical findings of Rogti & Ouarniki (2026), which show that directive and scaffolding feedback significantly encourage students' use of self-regulated writing strategies. This suggests that the presence of digital technology, despite its increasing dominance, has not, and likely will not, replace the essential role of lecturers as mentors who provide contextual explanations and feedback tailored to students' individual needs. Conversely, an optimal combination of structured lecturer guidance and critical use of digital technology has the potential to create a more effective German writing learning ecosystem than relying on either element alone .

The findings related to writing motivation dominated by the perception of uniqueness and interest in the characteristics of the German language itself also provide important implications for curriculum design (Purwanto et al., 2025). This kind of intrinsic motivation, which is different from instrumental motivation such as the demands of academic grades, is a valuable asset that lecturers can utilize to design more meaningful writing assignments, for example by raising cultural themes, social phenomena, or topics that genuinely interest students, in line with the genre-based writing approach proposed by Hyland (2007), which emphasizes the importance of the connection between the writer's communicative purpose and the structure of the chosen text. Improving students' German writing skills requires a multidimensional approach that combines strengthening contextual grammar, developing conscious and reflective self-regulation strategies, strengthening self-efficacy through supportive writing experiences, optimizing the role of lecturer feedback, and providing critical digital literacy in using translation technology and generative artificial intelligence as tools to assist, not replace, the students' own thinking and language processes.

CONCLUSION

This study concludes that German Language Education students face writing challenges dominated by the complexity of the German article system and case declensions, followed by limited vocabulary and confusion about verb position in sentences. In facing these challenges, students develop a combination of self-regulation strategies in the form of independent rereading and social support from lecturers and peers, in addition to the use of translation technology and generative artificial intelligence, which have become an integral part of the current foreign language writing learning ecosystem. Students' writing confidence levels are recorded at a moderate level, lower than their perceived vocabulary mastery, indicating a gap between technical competence and self-confidence that requires special attention in learning design.

Based on these findings, this study recommends several pedagogical steps. First, grammar instruction, particularly the article and case systems, needs to be contextually integrated through repeated freewriting exercises, rather than isolated structural exercises, so that students can automate their use in authentic text production. Second, lecturers

need to explicitly equip students with critical digital literacy in using translation tools and generative artificial intelligence, for example, through collaborative discussions about the limitations of these tools in capturing the grammatical and cultural nuances of German, so that students can position these technologies as verification tools, not substitutes for independent linguistic reasoning. Third, strengthening writing self-efficacy needs to be an explicit focus in learning design, for example, through the provision of gradual writing assignments with measured levels of difficulty, accompanied by constructive and appreciative feedback on progress, rather than solely oriented towards error correction.

This study has limitations, particularly the relatively limited number of participants and the descriptive design, which does not allow for empirical causal inferences between specific strategies and improved writing skills. Future research is recommended to expand the number of participants, incorporate experimental or longitudinal designs to test the effectiveness of the recommended pedagogical interventions, and further explore how patterns of generative artificial intelligence use develop throughout the course and their impact on the long-term development of writing independence in German Language Education students.

BIBLIOGRAPHY

- Bandura, A. (2023). Cultivate Self-Efficacy for Personal and Organizational Effectiveness. In E. Locke & C. Pearce (Eds.), *Principles of Organizational Behavior* (1st ed., pp. 113–135). Wiley.
<https://doi.org/10.1002/9781394320769.ch6>
- Baten, K. (2019). Teaching the German case system. *Widening Contexts for Processability Theory*, 301.
- Cheng, S., Lin, C., Wei, D., & Chen, Y. (2026). A longitudinal psychological model of writing development: Interactions among self-efficacy, regulation, and anxiety. *Frontiers in Psychology*, 17, 1757045.
- Hyland, K. (2007). Genre pedagogy: Language, literacy and L2 writing instruction. *Journal of Second Language Writing*, 16(3), 148–164.
- Hyland, K. (2019). *Second language writing*. Cambridge university press.
- Menzel, K. (2024). Exploring Word Formation Trends in Written, Spoken, Translated and Interpreted European Parliament Data—A Case Study on Initialisms in English and German. *Proceedings of the IV Workshop on Creating, Analysing, and Increasing Accessibility of Parliamentary Corpora (ParlaCLARIN)@ LREC-COLING 2024*, 57–65. <https://aclanthology.org/2024.parlaclarin-1.9/>
- Purwanto, A., Lustyantje, N., & bin Abdul Hakim, M. K. (2026). Needs Analysis of Developing a German Descriptive Writing Learning Model Level A1 Using Project Based Learning. *International Conference on Islamic Education and Instruction*, 2(1), 1–13. <https://conferences.uinsaid.ac.id/iciei/paper/view/823>
- Purwanto, A., Lustyantje, N., & bin Abdul Hakim, M. K. (2026). Transformasi Pembelajaran Menulis Bahasa Jerman Melalui Project-Based Learning: Teori, Strategi, dan Implementasi. *EDUPEDIA Publisher*, 1–218.
- Purwanto, A., Lustyantje, N., & Hakim, M. K. B. A. (2025). From Project to Creativity: How Academic Culture Shapes the Success of Project-Based Learning in Creative Writing Programs? *Journal of Cultural Analysis and Social Change*, 1844–1857.
- Purwanto, A., Lustyantje, N., & Murtadho, F. (2024). Assessment of Student Attitudes in German Writing Learning Based on 21st Century Skills. *Journal of Education Method and Learning Strategy*, 2(02), 274–291.



- Rogti, M., & Ouarniki, O. (2026). From error correction to strategy support: AI-powered metacognitive scaffolding in assessing EFL writing performance and self-regulatory engagement. *Language Teaching Research*, 13621688261420086. <https://doi.org/10.1177/13621688261420086>
- Tsui, A. B. M., & Cheng, Y. (2022). Foreign Language Anxiety and English Medium Instruction Classrooms: An Introduction. *English Teaching & Learning*, 46(3), 203–212. <https://doi.org/10.1007/s42321-022-00122-9>
- Yang, Z., & Zhang, L. J. (2026). Examining the Impact of Digital Linguistic Landscapes on Students' motivation, and Self-Perceived Achievement in Second Language Writing. *International Journal of Applied Linguistics*, 36(1), 652–666. <https://doi.org/10.1111/ijal.12801>