



Improving Students' English Writing Skills through Self-Assessment

Ana Cecilia Martínez de la Vega

Coordinator: María Rossana Ramírez Ávila

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Nowadays, learning English has become the common language to communicate worldwide. According to Getie (2020), English has an international significance because it is spoken, understood, and read in most parts of the world. Furthermore, in terms of education, English is considered the most common language of international education and intercultural communication. It allows people access to an incredible amount of information (Sharifian, 2009).

In learning English as a Foreign Language (EFL), writing is a skill that must be focused on to foster students' English proficiency. Although the importance of the writing skill when learning a language, secondary-level students face many difficulties. The main challenges are the application of traditional methods that only focus on the usage of language rather than its authentic use, the scarce opportunities to practice writing outside the classrooms, and the rote learning and reproduction of tests in a memorized way (Dastgeer & Afzal, 2015).

Regarding assessment, in EFL contexts, marks and grades have always been applied as signposts to pedagogical practices and learning (Bemoussat & Bouyakoub, 2019). However, over the last decade, language testing has experimented with a shift from traditional evaluation to assessment based on different types such as peer-assessment, self-assessment, and portfolio (Fathi & Khodabakhsh, 2019).

In Ecuador, secondary-level students face difficulties in their written expression while communicating in academic and real-life situations. According to Fabre et al. (2015), one of the reasons the Ecuadorian students' English writing skills are deficient is the lack of collaborative learning strategies, the vague use of formative assessment, and effective feedback in the classroom. In my classroom, the context is

the same; students have various difficulties expressing their ideas when writing. The main reasons are the lack of vocabulary, knowledge, and understanding of writing. Furthermore, they do not have enough opportunities to practice their writing skills in a real-life situations, making it hard for them to enhance their writing skills.

This action research, with the application of quantitative and qualitative approaches, focuses on exploring the effect of self-assessment on students' English writing skills. Thus, students were involved in different strategies, activities, and opportunities to assess and improve their own work by correcting their mistakes and using rubrics and technology.

Literature Review

This section includes relevant studies about teaching English as a Foreign Language writing, self-assessment, and writing skill, and self-assessment as the basis of this innovation. It displays the theoretical foundation from books and scientific articles used to support the variables of this study.

Writing Skills

Writing skills are academic and work-related performance aspects. Kim et al. (2021) claimed that writing is a challenging and integral part of instruction since students are expected to write informational, narrative, and opinion genres for various audiences, purposes, and specific tasks. Thus, its development combines different skills and knowledge that students must be trained to master in their writing quality (Sari et al., 2021).

According to Kim et al. (2021), writing focuses on a comprehensive set of skills (working memory), language skills (vocabulary), transcription skills (spelling and

handwriting), and higher-order cognition (monitoring, goal setting, perspective taking, inferencing), socio-emotion, topic, and discourse knowledge.

Similarly, Teng (2020) claimed that writing asks students to be critical thinkers. The researcher stated that teachers should focus on instruction based on self-regulated writing strategies to help students deal with the difficulty of the writing process and increase their attitudes and motivation about writing. These strategies relate to expressing opinion and ideas to persuade, inform, report or narrate through texts (Rosario et al., 2019).

Training in EFL Writing

Teaching students how to write in the target language is an aspect of education in the context of EFL. However, Ariyanti (2016) manifested that the teaching-learning writing process in places where English is learned as a foreign language has different challenges related to grammatical issues, difference in cultural backgrounds, and lack of opportunities to use the language in real contexts.

Different studies have pointed out strategies teachers can apply in their EFL classrooms to increase students' motivation and willingness to improve their writing skills (Fathi & Rahimi, 2020). Zhang and Qin (2018) stated that to develop student's writing skills; teachers can apply strategies such as the activation of learners' prior knowledge, explanation and modeling of activities, and reflections on what the students want to know and like to cover in the lessons.

Similarly, currently, teachers have become an ally of technology by using Facebook (Fithriani et al., 2019); Instagram (Prasetyawati & Ardi, 2020); and other tech tools to help students improve their writing skills.

Finally, integrating self-assessment, peer-assessment and teacher feedback is a fundamental aspect of teaching EFL writing skills. Huisman et al. (2019) asserted that this kind of assessment and feedback positively impacts students' writing performance. Thus, the correct and systematic application of these types of evaluations can benefit students to correct their own mistakes and help their peers enhance their writing skills (Ratminingsih et al., 2018).

Self-Assessment

Self-assessment is an essential component of formative assessment. Jamrus et al. (2019) claimed that it is a source of feedback that provides accurate, useful, and practical information that motivates students to reflect on their own English learning. The researcher also mentioned that self-assessment promotes critical thinking and develops students' sense of autonomy when learning English.

Andrade and Valtcheva (2009) provided important principles that underlie self-assessment. These are (1) articulation of expectations, (2) self-assessment, and (3) revision. They pointed out the importance of the teachers' explanation of the task's main objective and how the self-assessment process must be conducted. In this stage, "the teacher can either outline the criteria or discuss it with the students in the class before carrying out each activity" (Andrade & Valtcheva, 2009, p.65).

In the next stage, students create the initial draft by continually monitoring their progress and comparing their performance against the criteria given in the first stage. Finally, in the third stage, students use feedback to improve their performance. To apply this process efficiently, Andrade and Valtcheva (2009) highlighted the importance of using rubrics for assessment.

Even though the importance of self-assessment in teaching English writing, there are some challenges that teachers need to consider when applying this strategy.

When using self-assessment, teachers must prepare carefully, explain the tasks, and give students enough time to understand the self-assessment process (Bhatti & Nimehchisalem, 2020). Besides, according to the researchers, the teachers need to invest more time creating rubrics or checklists for each task, which could be tedious. Finally, applying rubrics and criteria could limit students from expressing their ideas and creativity.

Innovation

The lesson plan of this innovation lasted four weeks (Appendix 1) and covered different topics related to tourism and travel. Due to the COVID-19 pandemic, the innovation was implemented in the online teaching modality. The classes were conducted through Zoom, Microsoft Teams, and WhatsApp. The unit plan and performance task were based on the Backward Design Model, which was created by Wiggins and McTighe (2005).

According to Wiggins and McTighe (2005), the Backward Design model is the process of designing a course or unit. Here, the students' outcomes, assessment, and teaching instructions are aligned to authentic performance tasks where students can show their knowledge and understanding of a topic. The performance tasks are authentic activities that allow students to perform to a specific audience in real or simulated scenarios (Alvarez, 2020).

The performance task used for this innovation was the following:

I want my students to learn language uses, including vocabulary and expressions related to travel and grammar regarding simple present tense. Besides, they will write five sentences by using the third person verb ending correctly and using word orders when writing the sentences. So that, in the long run, and on their own,

they will create interesting and creative sentences related to the place they want to visit.

In the first stage of this innovation, students were introduced to the main topics and content to be covered during the unit and the final performance task. In this innovation, the main topic was related to places in town and tourist places to visit. Thus, all the activities and teaching materials were aligned to the performance task by establishing the transfer goal, essential questions, enduring understanding, skills and knowledge, and the main objectives of the unit.

The second stage was developed by addressing the evidence that shows students' improvements. The main element of this stage where the final performance tasks that students have to develop at the end of the unit. Summative and formative assessments such as vocabulary tests, collaborative work, and self-assessment were applied in this stage.

The third stage was developed by associating the activities and teaching materials to be applied in the instruction with stages 1 and 2. Consequently, different activities such as matching texts with pictures, completing word puzzles, and self-assessment activities were used to develop the final performance tasks. All the activities and teaching materials were taken from the Ecuadorian Ministry of Education and online resources.

This innovation focuses mainly on the integration of self-assessment in the EFL classroom to enhance students' writing skills. Consequently, from the first week, students, apart from learning the required content, had the opportunity to come across some concepts such as essential questions, checklists, and self-assessments. After the first week, students had the chance to practice how to self-assess their own work by using a checklist and rubrics. Here, the teacher's role focused on modeling

and guiding the self-assessment practice by providing examples of how this process is conducted.

The self-assessment checklist was applied as an evaluation tool for students. The checklist was used by students four times; each time, a new criterion was introduced according to the taught content. The final checklist assessment contains six criteria: use of simple present, use of travel vocabulary words, correctly use of third-person endings, use of capital letters, word orders, and interesting images (Appendix 2).

For instance, in week 2, students had to use the checklist to assess their vocabulary, use of capital letters, and word order. However, in week four, they had to self-assess the use of simple present, travel vocabulary, third-person ending, capital letters, and word order. In this step, students were more autonomous in assessing based on their own decisions and by following the self-assessment guidelines provided by the teacher. Finally, in the last week, students worked on the final performance tasks. The students assess the same task to compare the results from the pre-test and post-test, these results were used to report the results of this study.

Research Methodology

The present study is action research. According to Niemi (2019), action research “combines theory, practice and improvement of classroom practices” (p.651). Consequently, this research focused on applying the self-assessment strategy to explore its effectiveness in fostering students’ writing English skills.

The implementation of this innovation took place in a secondary public school located in Quito, Ecuador. The data was analyzed by using quantitative and qualitative approaches. Ugur (2020) stated that the qualitative approach involves understanding and exploring human behavior from the informant’s perspective. On the other hand, the

quantitative approach focuses on data collection through measuring things and analysis using statistical and numerical processes (Hassan & Dzakiria, 2020). To achieve the main objective of this study, this research is led by the following research questions:

1. To what extent does self-assessment improve EFL students' writing skills?
2. What are students' perspectives regarding applying self-assessment to foster their writing skills?

Participants

The participants of this innovation were ten students from a public school in Quito, Ecuador, and the students were attending primary education according to the Ecuadorian Ministry of Education policies. Regarding this innovation, participants were selected by following a purposive sampling. This sample type is “the one whose characteristics are defined for a purpose that is relevant for the study” (Andrade, 2021, p.86).

The participants' ages range from 12-14 years old. Their native language was Spanish, and their English proficiency level according to the Common European Framework of Reference (CEFR) was A1. They were in the 8th year of primary education, and all were taking English as a Foreign Language classes. All students had access to the internet connection in their homes and the school.

Instruments

To measure the pre and post-performance tasks, an instructor-grades rubric was applied (Appendix 3). This rubric contained the English standards based on the Pre A1 Started writing from the CEFR, and it is divided into four criteria: vocabulary, grammar

use, organization, and punctuation. Each measure is graded from 1 to 5 points, where five is the highest.

The results from the interviews were analyzed using narrative analysis. According to Bamberg (2012), narrative analysis is a qualitative research tool where the researcher focuses on a topic, and the data is collected through the participants' experiences of particular events. Each interview will last 10 minutes, and it was conducted through Zoom. The interview was semi-structured, and it has the following questions:

1. To what extent do you find self-assessment effective in improving your writing skills?
2. What was your experience of self-assessing your writing work?
3. Which advantages does self-assessment offer for improving writing skills?
4. Which disadvantages did you notice when self-assessing your work?

Data Analysis

Microsoft Excel was used to analyze quantitative data and find the mean, percentages, and frequencies. Furthermore, after conducting the interviews with students, the recordings were transcribed using Microsoft Word. After transcribing the recording, the interviews contained 1665 words (Appendix 4). The transcripts were coded and grouped according to the issues of writing and self-assessment.

Ethical Considerations

This study was carried out by following some ethical considerations. First, to obtain permission to be part of the innovation, the school principal, parents, and students were notified by a letter where they had to indicate if they agreed or disagreed with being part of this study. This letter included essential information about the innovation and emphasized voluntary and anonymous participation. Besides, research bias was voided by following the research procedures, data collection, and data analysis

provided by Head (2020). Finally, it also indicated that all the information and data received from participants would be kept confidential, and pseudonyms would be used as a part of ethical considerations.

Results

After applying the pre and post-test to the 10 participants, the results showed a significant improvement in all rubric criteria. The total mean of the pre-test was 3.95 points, while the post-test was 4.55 over 5 points. Figure 2 shows the results of each standard applied in the rubric. The measure that students improved on the most was punctuation; students used efficiently the third person ending, capital letters, and final periods at the end of each written sentence.

Figure 2.

Pre and post-test results

| Pre-test and Port-test results | | |
|---------------------------------------|-------------|-------------|
| Criteria | Pre-test | Post-test |
| Vocabulary | 4.2 | 4.5 |
| Grammar Use | 4 | 4.2 |
| Organization | 4 | 4.5 |
| Punctuation | 3.5 | 5 |
| Mean | 3.95 | 4.55 |

The results are pointed out according to the research questions explained below:

RQ#1: Does self-assessment influence students' writing skills?

The first research question sought to find to what extent self-assessment helped students improve their writing skills. As mentioned before, a rubric was the instrument to grade the pre and post-test. The evaluation showed that students increased their writing skills in all criteria. Notably, all students (n=10) improved their writing skills, but punctuation and organization were the main enhanced aspects.

RQ#2: What are the students' perspectives on self-assessing their own work?

This research question was carried out after the implantation of the innovation.

According to the students, applying self-assessment in their English classes was significant to increasing their writing skills. They all believe that using self-assessment in their classes allows them to reach the lessons' objectives and decide the best technique to perform the writing activities better.

S1, for instance, stated that she thinks that self-assessment helps students realize their own mistakes and be able to correct them. She claimed that *by applying the self-assessment technique, you don't feel judged by others; therefore, you learn from your mistakes to avoid repeating them*. Likewise, S1 and S2 agreed that the self-assessment process very efficient because is the best way to learn by correcting your mistakes.

S5 added that self-assessment is important because you can understand the aspects you are mistaken. S5 indicated that *in my experience as a student, being able to improve my writing is something significant. So, using this method helped me to get the results I expected*. S8 believes that self-assessment is very effective since it allows students to expand their knowledge and see what things they can improve while writing.

Regarding students' experience of self-assessing their own work, it was found that for the majority of students, it was the first time that they self-assess their own writing. Furthermore, they explained they felt a little nervous; however, they got more confidence to self-assess their sentences after practicing. This is illustrated in the following examples:

For S7, it was the first time he self-assessed his sentences, and he stated that *it was a new and exciting experience*. Similarly, S10 manifested that he felt slightly nervous because he did not know how well he wrote the sentences. On the other hand, S3 and S5 claimed that they loved self-assessing their own sentences.

Regarding the advantages of self-assessment, students found different benefits when self-assessing their writing. The main advantages are correcting errors, structuring sentences better, and learning and comprehending the language more through mistakes.

S3 stated that the advantages of self-assessment were *to correct errors and improve the structure of the sentences*. Likewise, S10 indicated that *you, as your own critic, can realize your mistakes and understand them and not commit those errors anymore*. S3 also explained that *self-assessment allows students to become more aware of their learning progress and achieve a higher degree of responsibility*.

According to the interview, students found some disadvantages in applying self-assessment. They are mostly related to the lack of knowledge of how to self-assess correctly, time for using self-assessment, and demotivation to continue writing due to probably bad marks.

S2 asserted that *one disadvantage is that most students do not know how to self-assess correctly because they do not practice it frequently*. S7 explained that *people are often very hard on themselves and get discouraged when making mistakes*. Finally, S1 claimed that it is necessary to have external support because there are aspects that peers or teachers can help them to improve their writing.

According to Jamrus et al. (2019), self-assessment is a source of feedback that provides accurate, practical, and useful information to motivate students to reflect on their knowledge. All the participants from this study agree with this statement, and they indicated that applying self-assessment helped them correct their errors and mistakes.

Discussion

The analysis of the data collected from students' writing and their perceptions reveals a similarity in comparison to the similar study conducted by Jamrus et al. (2019). The results from the post-test showed that applying self-assessment on writing helps students foster their writing skills and have more explicit expectations to achieve their learning goals efficiently.

The results from the post-tests are supported by Andrade and Valcheva (2009). Students could increase their writing skills by sharing, guiding, monitoring, and practicing how to self-assess. The researchers highlighted the importance of following a systematic process to help students apply the self-assessment efficiently. In this innovation, those steps were followed, and, as a result, students increased their writing skills.

The second research question posed in this study relates to the students' perception of applying self-assessment in their English classes. Jamrus et al. (2019) claimed that self-assessment helps students feel more motivated to learn English. In this regard, all the participants indicated that even though they thought nervous initially, they became confident and motivated to use self-assessment to improve their writing skills after practicing.

Some issues were found when applying the self-assessment approach in the English class. For instance, results from interviews indicated that students pointed out the lack of knowledge of how to self-assess correctly, time for applying self-assessment, and demotivation to continue writing due to probably bad marks obtained were the main obstacles student founds on this application. These results are supported by Bhatti and

Nimehchisalem (2020), who claimed that applying self-assessment could be tedious if students do not have enough knowledge of how to conduct self-assessment.

Conclusions

This study intended to explore how the students' writing skills can be improved by applying the self-assessment strategy. The findings demonstrate that all the participants enhance their writing skills after learning and practicing the self-assessment principles. The students, who self-assessed their own work through the application rubrics, improved their vocabulary, grammar use, organization, and punctuation. In the end, they wrote well-structured, clear, and understandable sentences.

Monitoring students and providing well-structured lessons is essential to help them increase their writing skills. To help students perform better in their tasks, it is necessary to provide them with enough information and model how the self-assessment process must be carried out. Likewise, another essential element of this innovation was the application of rubrics because it showed students what the teacher expected from them at the end of the innovation.

Limitations

The present study has some limitations. This study cannot be generalized due to the small number of participants. Furthermore, the bad internet connection sometimes made some students not attend the lessons, so they were not efficiently trained in some topics. Finally, this study was conducted with ten students who wanted to participate voluntarily, so the result probably cannot be valid for all the population.

Recommendations

For future studies, it is suggested to apply this innovation with more participants so that this study can be more reliable and valid. It would be interesting to focus on students with other English proficiency levels to see the effect of using this innovation. Finally, future research could be conducted on face-to-face learning after the pandemic period.

References

- Alvarez, L. C. (2020). The benefits of the Backward Design Model in the English as a foreign language context. *IJEE (Indonesian Journal of English Education)*, 7(2), 145-158. [10.15408/ijee.v7i2.17785](https://doi.org/10.15408/ijee.v7i2.17785)
- Andrade, C. (2021). The inconvenient truth about convenience and purposive samples. *Indian Journal of Psychological Medicine*, 43(1), 86-88. <https://journals.sagepub.com/doi/pdf/10.1177/0253717620977000>
- Andrade, H., & Valtcheva, A. (2009). Promoting learning and achievement through self-assessment. *Theory into Practice*, 48(1), 12-19. <https://doi.org/10.1080/00405840802577544>
- Ariyanti, A. (2016). The teaching of EFL writing in Indonesia. *Dinamika Ilmu*, 263-277. <https://doi.org/10.21093/di.v16i2.274>
- Bamberg, M. (2012). Narrative analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 85–102). American Psychological Association. <https://doi.org/10.1037/13620-006>
- Bhatti, N., & Nimehchisalem, V. (2020). A review of research on student self-assessment in second/foreign language writing. *Indonesian JELT: Indonesian Journal of English Language Teaching*, 15(2), 125-151. <https://doi.org/10.25170/ijelt.v15i2.1846>
- Bemoussat, N. D., & Bouyakoub, N. (2019). English Language education in Algeria: Hostage of an exam-centric education System. *Arab World English Journal*, 10(3), 202-219.

IMPROVING STUDENTS' WRITING SKILLS THROUGH SELF-ASSESSMENT
17

- Dastgeer, G., & Afzal, M. T. (2015). Improving English writing skill: A case of problem based learning. *American Journal of Educational Research*, 3(10), 1315-1319.
- Hassan, M. U., & Dzakiria, H. (2020). Students' beliefs towards written CF and their impact on writing accuracy in EFL class: A Pakistani EFL context. *International Journal of Advanced Science and Technology*, 29(6), 648-658.
- Jamrus, M. H. M., & Razali, A. B. (2019). Using self-assessment as a tool for English language learning. *English Language Teaching*, 12(11), 64-73.
10.5539/elt.v12n11p64
- Kim, Y. S. G., Yang, D., Reyes, M., & Connor, C. (2021). Writing instruction improves students' writing skills differentially depending on focal instruction and children: A meta-analysis for primary grade students. *Educational Research Review*, 34, 1-15. <https://doi.org/10.1016/j.edurev.2021.100408>
- Fabre, P., Boroto, J., & Soto, S. (2015). *Approaches to EFL teaching: Curriculum, instruction, assessment, and technology*. Machala, Ecuador: Universidad Técnica de Machala.
- Fathi, J., & Khodabakhsh, M. R. (2019). The role of self-assessment and peer-assessment in improving writing performance of Iranian EFL students. *International Journal of English Language & Translation Studies*, 7(03), 1-10.
- Fathi, J., & Rahimi, M. (2020). Examining the impact of flipped classroom on writing complexity, accuracy, and fluency: A case of EFL students. *Computer Assisted Language Learning*, 1-39.
- Fithriani, R., Dewi, U., Daulay, S. H., Salmiah, M., & Fransiska, W. (2019). Using Facebook in EFL writing class: Its effectiveness from students'

perspectives. *KnE Social Sciences*, 634-645.

<https://doi.org/10.18502/kss.v3i19.4892>

Getie, A. S. (2020). Factors affecting the attitudes of students towards learning English as a foreign language. *Cogent Education*, 7(1), 173-184.

<https://doi.org/10.1080/2331186X.2020.1738184>

Granda, G. K. A., & Ramirez-Avila, M. R. (2020). Classifying vocabulary in Google Sheets to improve word recognition and reading comprehension in EFL learners: an action research study. *AtoZ: novas práticas em informação e conhecimento*, 9(2), 24-31.

Head, G. (2020). Ethics in educational research: Review boards, ethical issues and researcher development. *European Educational Research Journal*, 19(1), 72-83.

<https://doi.org/10.1177/1474904118796315>

Huisman, B., Saab, N., van den Broek, P., & van Driel, J. (2019). The impact of formative peer feedback on higher education students' academic writing: a Meta-Analysis. *Assessment & Evaluation in Higher Education*, 44(6), 863-880.

Niemi, R. (2019). Five approaches to pedagogical action research. *Educational Action Research*, 27(5), 651-666. 10.1080/09650792.2018.1528876

Prasetyawati, O. A., & Ardi, P. (2020). Integrating Instagram into EFL writing to foster student engagement. *Teaching English with Technology*, 20(3), 40-62.

<http://www.tewtjournal.org>

Ratminingsih, N. M., Marhaeni, A. A. I. N., & Vigayanti, L. P. D. (2018). Self-Assessment: The Effect on Students' Independence and Writing Competence. *International Journal of Instruction*, 11(3), 277-290.

Rosario, P., Högemann, J., Núñez, J. C., Vallejo, G., Cunha, J., Rodríguez, C., & Fuentes, S. (2019). The impact of three types of writing intervention on

students' writing quality. *PloS one*, 14(7),

<https://doi.org/10.1371/journal.pone.0218099>

Sari, Y. I., Utomo, D. H., & Astina, I. K. (2021). The effect of problem based learning on problem solving and scientific writing skills. *International Journal of Instruction*, 14(2), 11-26. 11-26. <https://doi.org/10.29333/iji.2021.1422a>

Sharifian, F. (Ed.). (2009). *English as an international language: Perspectives and pedagogical issues* (Vol. 11). Multilingual Matters.

Teng, F. (2020). The role of metacognitive knowledge and regulation in mediating university EFL learners' writing performance. *Innovation in Language Learning and Teaching*, 14(5), 436-450. <https://doi.org/10.1080/17501229.2019.1615493>

Ugur, N. G. (2020). Digitalization in higher education: A qualitative approach. *International Journal of Technology in Education and Science*, 4(1), 18-25. <https://doi.org/10.46328/ijtes.v4i1.24>

Wiggins, G., & McTighe, J. (2005). *Understanding by design*. ASCD.

Zhang, L. J., & Qin, T. L. (2018). Validating a questionnaire on EFL writers' metacognitive awareness of writing strategies in multimedia environments. *Metacognition in language learning and teaching*, p. 157-178.

Appendix 1

Unit design based on the Backward Design Model

Available upon request.

Appendix 2

Rubric for the students' performance tasks

Available upon request.

Appendix 3

Checklist self-assessment

Available upon request.

Appendix 4

Transcript of the interviews

Available upon request.

Appendix 5

Available upon request.