

Growth Mindset Feedback as an Effective Practice to Prompt Orthography Improvements in High-School Students Writing

Retroalimentación con mentalidad de crecimiento como una práctica efectiva para la mejora de la ortografía en alumnos de secundaria

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Abstract

A growth mindset feedback values mistakes, shows progress and creates positive challenges to foster improvements. This article analyzes the potential that this type of feedback has and explores its usefulness in the teaching of orthography in secondary students, a group that has been neglected in previous research related to spelling. For that purpose, an experimental study was conducted with tenth-grade students from a school in Chile. A control group received regular feedback, which only indicated when a word was misspelled and how it should be spelled correctly; while a treatment group received growth-minded feedback. In this exploratory study, the results are encouraging, showing that the treatment group improved its spelling, especially in the use of tildes. These findings are relevant for educators who teach writing and leave the challenge of creating assessment policies and teacher training programs that should include a growth mindset framework.

Keywords: growth mindset, feedback, orthography, high-school students.

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Resumen

Una retroalimentación con mentalidad de crecimiento valora los errores, evidencia el avance y desafía positivamente para fomentar progresos. Este artículo analiza el potencial que este tipo de feedback posee y explora su utilidad al aplicarlo en la enseñanza de la ortografía en alumnos de educación secundaria, un grupo etario que no ha recibido mucha atención en investigaciones previas relacionadas con la ortografía. Para ello se realizó un estudio experimental con alumnos de segundo medio de un colegio en Chile. Un grupo de control recibió retroalimentación regular, que sólo indicaba cuándo una palabra estaba mal escrita y cómo se debería escribir correctamente; mientras que un grupo de tratamiento recibió retroalimentación con mentalidad de crecimiento. En este estudio exploratorio, los resultados son alentadores mostrando que el grupo de tratamiento mejoró su ortografía, sobre todo en el uso de tildes. Estos hallazgos son de relevancia para los profesores que enseñan escritura y dejan como desafío la creación de políticas de evaluación y programas de perfeccionamiento docente que promuevan una mentalidad de crecimiento en los estudiantes.

Palabras clave: mentalidad de crecimiento, retroalimentación, ortografía, estudiantes de educación secundaria.

Introduction

High school students, from Spanish-speaking countries, have several orthographic mistakes when they write. Unfortunately, research about this problem has been neglected. In Latin American countries, writing investigations have focused mainly on describing aspects related to the construction of the texts, and the resources that students use when they write (Bedwell, Hernández, Molina, Sotomayor, 2013) but orthography has been left aside. As Sotomayor et al. (2017) notice, “spelling is a topic rarely addressed in recent studies on school writing, although it plays an important role in the processes of transcription, readability, and communication” (p. 316). Thus, research about effective instructional methods for teaching spelling in Spanish is scarce, and the ones that study the performance of high school students are even rarer.

The SERCE study, conducted in 2006 (as cited in Sotomayor et al., 2013), which encompass skills from both Latin America and the Caribbean, shows that

6th grade students commit an average one orthographic error every ten words in most Latin American countries, and only in Cuba, Uruguay, Paraguay, and Brazil, is there a positive difference with respect to the other countries, since there was an error every twenty words” (p. 107)

And it should be considered that in Brazil Spanish is not the native language. Subsequently, in the TERCE study, implemented in 2013, the language sections were separated between reading and writing, finding that at the 6th grade level only 56.1% of the students reach the level IV (highest) in readability of writing, which includes spelling, in line with the results of textual writing (Unesco, 2015).

One of the few investigations about spelling in Latin America is the one devised by Bedwell et al. (2013), which depicts a descriptive study that characterizes the orthographic performance of Chilean students after analyzing 250 narrative texts. The authors conclude that orthographic errors occurred in 17% of written words, and those mistakes were generally attested in words of frequent use, such as verbs “haber (to have)”, “hacer (do)” and “estar (be).” In addition, most recurrent errors are related to the omission of *tildes*¹ (mostly in the last syllable accented of the words), but there were also mistakes associated to literal misspelling, that is, making faults in specific letters (for instance, misspelling the word “gracias” as “grasias”). The authors also conclude that “the number of errors per each spelling problem decreases as the level of schooling progresses, with the exception of the lack of tildes (graphic accent)” (p. 124), whereby this last mistake is maintained throughout the years of schooling.

Within the learning of writing skills in Spanish, mastery of spelling is one of the complex aspects that students face (Bedwell et al., 2013), and this reality is not only a problem that concerns children who are in elementary school, but it is presented transversally at all levels of education (Boras, 2003; Graham & Perin, 2007; Morales & Hernández, 2004). That is severe, considering that most of the investigation regarding orthographic improvement has been concentrated in elementary and middle school (Brown, 1990). As Brown (1990) points out:

“A topic that has been sorely neglected is spelling performance in adults (...). As can be documented by any high school or college teacher, adults are far from perfect spellers and rather easily lose their spelling proficiency or confidence” (p. 392).

Furthermore, research has shown that many first-year college students perform poorly on college-level writing tasks because they did not acquire the skill in schooling years (Graham & Perin, 2007; Morales & Hernández, 2004).

According to Boras (2003), the paucity of research may also be related to the fact that spelling is a matter of interest for just a few linguists because “many view it as a literary convention or a school subject, rather than a scientific problem of language” (p.12). Boras added that another factor for spelling neglect could be the constant simplification that people give it because it is often perceived as a minor issue that can be improved with spell checkers and now most of the word processors have orthographic software attached.

So why is orthography so relevant nowadays? Why is it necessary that students improve it? First, the orthographic aspects allow to carry out a fluid reading process. If a text presents orthographic mistakes, that will hinder perceptions of the quality of ideas and could obstruct meaning (Campbell, Yagelski & Yu, 2014). Moreover, it is critical to elevate the relevance of orthography because

“from a cognitive and developmental point of view, the learning of spelling is relevant in the acquisition of written code in children. Along with the processes of composition, the domain of the code establishes the basis of written production. From a communicative point of view, orthographic knowledge is essential for the communicability of writing and for communication between communities that share the same language” (Sotomayor et al., 2017, p. 318).

That is why it is so important to elevate the relevance of orthography and reflectively promote its learning throughout all years of schooling (Díaz, 2010).

Additionally, Boras (2003) argues that making orthographic mistakes inhibits the confidence and motivation in writing. Poor spellers avoid writing long texts, and they do not want to show to any audience (not even parents nor teachers) their written work because they feel embarrassed by their performance. Furthermore, they avoid writing at all which could bring profound consequences in the future.

1. Tildes are graphic accents that mark word stress in Spanish language.

The lack of students' motivation, the self-belief that they cannot improve their writing, and the practices that instructors implement to teach orthography might be significant causes that explain the problem and its consequent stagnation about the enhancement of spelling. That is why this paper endorses that a *growth mindset feedback* can help high school students to improve their orthography, because it is a type of feedback that normalizes errors, and foster positive challenges so students want to improve. The growth-mindset feedback assesses processes more than results because it promotes the conviction that intelligence can be prompted through effort and that it is not a fixed element that cannot change (Dweck, 2006). Hence, this exploratory study postulates that this type of feedback might abate pre-conceptions regarding self-efficacy and may foster motivation.

This document will first offer a detailed explanation of the causes of the problem, reviewing the relevant literature. Then, it will illustrate why growth mindset feedback might serve as a useful strategy to help high-school students improve their orthography. And finally, it will explain an experimental study conducted on a small scale to explore the real potential that growth mindset feedback has addressing spelling issues in high-school students, presenting the results and providing some conclusions. This study offers an innovative experimental design because this is the first time that a growth mindset feedback approach has been proved for orthography, and we acknowledge that the method should be tested on a larger scale since the preliminary results of this study are encouraging.

Delving into the causes of the problem

This research considers two leading reasons that explain the problem established in the prior section: one is intrinsic to the learners, which is motivation and their self-beliefs; and the other one is extrinsic, which are the techniques that instructors apply to teach orthography. However, this review asserts that these two causes overlap and continually affect each other. For instance, if a teacher uses a not compelling and attractive methodology to teach orthography, this will have a substantial consequence in the student's motivation.

Cause 1: Lack of motivation and low self-efficacy regarding spelling

Motivation is a vital element in every learning process. Caso-Fuertes and García-Sánchez (2006) argue that motivation is "a set of processes involved in the activation, direction, and persistence of behavior" (p.2). It is then understood that these authors argue that teachers should encourage interest-based learning by presenting writing in a way that is meaningful to the student. They assert that the value given to the task, expectations, self-perceptions, and beliefs are essential components of motivation in writing, and orthography is one of its key elements.

Pajares (2003) points out that self-efficacy is a central point of interest in writing because it could encourage or constraint the composition process. Accordingly, Klassen (2002) establishes that the paucity of confidence about writing will obstruct academic success. On the contrary, those students who are highly motivated can deploy more skills and techniques to communicate better through writing. Thus, prompted students to create strategies that help them to improve their writing process, including orthography.

As Carol Dweck (2006) has pointed out, the self-efficacy, or the belief that a student has about him or herself of being capable of improving, affects his or her academic performance directly. If they have the fixed mindset that they are not good at spelling, they will be reluctant to deal with challenges that involve orthography. Thus, it is crucial to change their mentality. For that reason, motivation is vital, especially considering that spelling is not a natural matter of interest for many students, whereby teachers must be innovative in spelling instruction in order to foster and maintain interest and motivation.

Boras (2003) believes that poor spelling students circumvent writing long paragraphs because they do not want to be categorized as poor spellers. What is interesting is that the author explains those who do not wish to be seen by others as poor spellers take the time to edit and auto-correct their own work. That exercise makes them good spellers because they “take personal responsibility for monitoring and correcting their writing” (Boras, 2003, p.10). Thus, the beliefs that students have regarding their own spelling performance do affect their self-esteem and writing.

Among the approaches that have attempted to maintain motivation during the writing process, the *invented spelling* proposal has reached popularity. That method “assumes that misspellings should be ignored because they will correct themselves as the child matures and gains experience with the language.” (Brown, 1990). Thus, instructors do not mention or correct orthography errors. The primary objective of this technique is to engage students in writing, so they do not feel demotivated by expressing their ideas in writing. Indeed, invented spelling has been an excellent bet to promote and keep motivation (Brown, 1990) because students do not avoid writing assignments, and they feel encouraged to write more paragraphs.

Nevertheless, this tactic leaves many doubts open. First, it is very unlikely that this technique will be successful for high school students because at their age they already have gained experience with language acquisition. In addition, with the invented spelling approach students could learn that accuracy is not important in writing and that is dangerous (Brown, 1990). Students need to know that orthography is essential in the composition process and the possible effects that misspellings could cause in their audience. Additionally, it is a risk that if students visualize incorrect spelling, they can repeat the errors in the future because it is the exposure to misspellings that could influence their skills to learn and recall correct versions later (Brown, 1990). Thus, the invented spelling approach could be useful for younger students but might be too late for high school students

The role that instructors play and the practices that they use in the teaching of orthography is crucial, especially maintaining high levels of motivation in students.

Cause 2: Inadequate instruction techniques to teach orthography

Research has advocated for decades that the role of educators is crucial in orthography learning because instructional methods affect spelling performance (Boras, 2003.) They need to be innovative in the way they teach orthography, a subject that could be overwhelming for students. Regrettably, in many cases instructors apply ineffective techniques to teach spelling in classrooms, such as asking their students to memorize a list of words, dictation, using useless textbook exercises and taking tests that measure if students know or do not know orthographic rules (Brown, 1990).

Several investigations have shown throughout the time that spelling learning based on memorization of rules is not the most appropriate and does not bring meaningful learning (Bedwell et al., 2014; Graham & Miller, 1979; Graham, 1983.) Backhoff, Peon, Andrade, and Rivera (2008) manifest their preoccupation regarding a good percentage of teachers dedicate many hours to teach spelling rules that students do not employ in their written compositions. Moreover, it could be counterproductive because it can decrease student motivation.

As Sotomayor et al. (2017) underline it:

“The traditional teaching of decontextualized spelling rules is often unsuccessful, either because it does not focus on the errors that students make or because they hinder the processes of reflection and elaboration of regularities around the error” (p. 319).

Instead of having students memorizing rules, research has shown that is more effective an instruction that motivates students to understand and learn from their own spelling mistakes in a reflective way (Campbell Wilcox, Yagelski & Yu, 2014; Kaufman, 2005; Sotomayor et al., 2017). In order to achieve that purpose, it is essential that teachers encourage students to review, correct and edit their texts as a recursive process. (Backhoff et al., 2008;

Diaz, 2010). The rationale behind this instructional approach, based on reflection on spelling mistakes instead of learning orthographic rules, is that, just like Sotomayor et al. (2017) have demonstrated in their research, errors are concentrated in only some words and phenomena. Thus, it is more useful to teach spelling from the mistakes that the students are making, because they represent their gap, instead of having them learning isolated rules.

After reviewing these two causes, the questions now are, how is it possible to keep high-school students motivated while learning orthography? What system could be useful to help them improve their spelling? How can their mindset be changed, so they are capable of enhancing their spelling?

A new approach: growth mindset feedback to improve spelling

This study promotes the idea that growth mindset feedback could help high school students to enhance their orthography. On the one hand, this type of input directly attacks the lack of motivation and self-efficacy cause, by promoting confidence. On the other, it also serves as an innovative instructional practice to teach orthography, by positively challenging students taking into consideration their own mistakes and reflecting about them; all this within a trusted environment where making errors is allowed. Hence, this section will first dwell on the concept of a growth mindset, and then it will display existing literature that endorses this proposal.

The psychologist Carol Dweck (2006) has found that children's self-beliefs about their intelligence and performance have a profound consequence on their motivation and academic attainment. Her investigation shows that children typically hold one of two mindsets: they either believe that their intelligence is an immovable attribute, which represents a fixed mindset; or they think that their intelligence can be increased through hard work and effort, denoting a growth mindset (Dweck & Mueller, 1998; Dweck, 2006; Blackwell, Dweck, & Trzesniewski, 2007). Children with a fixed mindset do not like to be challenged, and they relate mistakes with indications of low ability or intelligence. On the contrary, students who hold a growth mindset value challenges and understand that effort is necessary to learn and improve.

Let's exemplify with a typical comment that a person with a fixed mindset would say: "I am not good at math". They have the fixed idea that they are not good enough and they will never be. On the other hand, someone with a growth mindset would say: "Even when math is hard for me, I know that I can learn and improve with effort and practice." Furthermore, individuals with a fixed mindset tend to give up when they are frustrated if they feel that some task is too complicated. Conversely, persons with growth mindset persevere even when they are frustrated because they are convinced that, with effort, they could overcome any situation (Dweck, 2006). Studies show that children with growth mindset respond well to challenge and that their grades improve. Conversely, children with a fixed mindset lose interest when they are challenged, and display motionless or decreasing grades (Blackwell, Dweck, & Trzesniewski, 2007).

Moreover, Dweck and her colleagues have demonstrated that children's mindsets can be changed. Thus, the role of instructors and the feedback they provide to students is crucial (Lemov, 2015). The input that intentionally seeks to generate growth mindset is directly correlated with an increase in motivation (Brock & Hundley, 2016; Paunesku et al., 2015). Thus, teachers should reinforce actions, and not traits in order to encourage and engage students. Doug Lemov (2015) stresses the following:

"If students are praised for traits ("You're smart"), they become risk-averse: they worry that if they fail, they won't be smart anymore. If students are praised for actions ("You worked hard, and look!"), they become risk tolerant because they understand that the things within their control—their actions—determine results" (p. 435).

Dweck & Mueller (1998) investigate the impact that a specific type of feedback might have on children mindsets. They analyze six studies to see the outcomes differences of praising for intelligence in contrast to praising for effort. They discover that in opposition to the prevailing opinion that praising for intelligence brings positive aftermaths on motivation, to acclaim for ability has negative consequences for students' engagement than praising for effort. They conclude that

“fifth graders praised for intelligence were found to care more about performance goals relative to learning goals than children praised for effort. After failure, they also displayed less task persistence, less task enjoyment, more low ability attributions, and worse task performance than children praised for effort. Finally, children praised for intelligence described it as a fixed trait more than children praised for hard work, who believed it to be subject to improvement” (p.33).

As Graham (1983) establishes:

“the effectiveness of a spelling program is heavily dependent upon students' attitudes. Regardless of the quality of the program (or intervention), progress may be restricted if students are not interested in spelling or are not motivated to spell words correctly.” (p. 563).

That is why offering feedback that promotes a growth mindset and praise for effort could be an innovative solution for orthography trouble, especially when students have the belief that they are not good at spelling. In short, praising for effort and conveying to the students their progress over time can promote the positive self-efficacy that Pajares (2003) considers as essential for the improvement of written compositions, and the motivation that Caso-Fuertes and García-Sánchez (2006) foster unsparingly.

It has been already demonstrated that growth mindset feedback has caused significant progress in the improvements of math skills, and just like mathematical results, spelling also has correct or incorrect final answers; therefore, it is to be expected that this type of feedback would be an equally valid method with orthography. Boaler (2016) believes that growth mindset feedback has been highly successful in math because it is a subject that is full of stereotypes that promote a fixed mindset. Spelling is too: it is a subject that has prejudices and, without the appropriate guidance, can affect motivation. In both math and spelling, it is more accessible for the teacher to follow the progress of the students and to know in which specific area they are struggling in order to challenge them positively.

Experimental and Exploratory Study

We present an exploratory study because it seeks to indagate the effectiveness of a specific type of feedback in order to generate new ideas or hypothesis related to the orthographic teaching in high-school years. This section will display the preliminary study conducted, in which we use a growth mindset feedback perspective as the primary theoretical framework, and will explain the methodology applied, the main results and conclusions.

Methodology

We conducted an experiment in order to investigate if growth mindset feedback has a positive influence on the improvement of high-school students' orthography. We invited 10th-grade students of the Graphic Industry School, a Chilean institution located in San Miguel, a province of Santiago of Chile, to be part of a writing workshop. The social characterization of the school is of middle to low income, with a vulnerability coefficient (IVE Sinae) for the year 2017 of 69.4% while the national average for high schools is 70.0%². Furthermore, the

2. JUNAEB, Prioridades 2017 con IVE Sinae Basica, Media y Comunal, <https://www.junaeb.cl/ive?lang=en>

results achieved in the national standardized test of the National System of Evaluation of Learning Results (Simce in Spanish), regarding reading comprehension for 2018, shows that the tenth grade students of this establishment obtained an average of 234 points, nine points less compared to the average of other establishments in the same socioeconomic conditions (Agencia de Calidad de la Educación, ACE, 2018).

Thirty students enrolled in the free program and were informed that they were part of a project conducted by the authors. We explained to all of them that they would have to write five essays of 150 to 200 words each and that they would receive corrections and feedback related to their orthography.

They were randomly separated into two groups of 15:

- **Control group:** students receiving typical “right” or “wrong” spelling corrections; that is, we marked spelling mistakes and indicated how the word would have been spelled correctly. We applied the categorization that Kaufman (2005) points out as the most traditional and frequent corrections made to spelling mistakes (and that is used by most instructors who teach writing in schools): “The teacher places the missed tildes marks and cross out those that are over, write the missing capitals, separate words if they are joined and join if there were more separations” (Kaufman, 2005, p. 12).
- **Treatment group:** students receiving growth mindset feedback, that focused on praising their efforts and personal progress and that positively challenged them to improve. We also marked their spelling mistakes and indicated the correct form of writing the words, but additionally, and in contrast to the control group, we *explicitly* maintained that errors are welcome in order to learn and gave them a challenge.

The authors proposed the topics for the essays. The rationale of choosing argumentative texts was to appeal that the students could feel free of providing their opinions. To select the topics, we inspired us in the writing tasks deployed in the British international test IELTS. Those themes are controversial per se; therefore, they invite in a compelling manner to write about a personal point of view. Moreover, from all the IELTS topics, we selected those that could be familiar to the students, for instance themes related to education.

Topics:

- **Essay 1:** Should standardized assessments disappear or be maintained? Why?
- **Essay 2:** “The purpose of higher education is to help students find a better job in the future.” To what extent do you agree or disagree with that statement?
- **Essay 3:** “It is better for people to learn languages during their childhood.” To what extent do you agree or disagree with that statement?
- **Essay 4:** Should classrooms be single-sex or mixed? Why?
- **Essay 5:** Do you think that having a higher education degree is necessary to be successful in life? Why?

We decided to assign five essays in order to follow patrons in each student spelling mistakes. Two or three essays would not be enough for that purpose. Having five compositions allowed us to generate customized challenges based on personal errors of each individual and to see their orthographic performance over time. Once the students received the assignment, they had one week to write and submit their task. Then, the authors had one more week to assess and correct. The students received their corrected tasks at the same time that they receive the second assignment directions.

The orthographic mistakes were counted and separated into three different categories:

- **Errors related to accentuation marks**, such as when students did not place tildes when necessary or when they put them in an incorrect place.
- **Literal errors**, such as when students confused one letter with another (e.g., univercidad instead of universidad), when they omitted letters (e.g., echo instead of hecho), or when they confused lowercase and uppercase letters (e.g., chile instead of Chile).
- **Punctuation mistakes**, such as not ending a paragraph with a period, overusing commas, not separating sentences with periods, etc.

In order to illustrate the errors that the students made, we attach two photos with examples of their work, both corresponding to the third writing assignment (Example 1 and Example 2).

Los niños en general tienen mejor aprendizaje que los adultos. Por que los niños están a temprana edad de su desarrollo estudiantil. Además tienen todos los recursos necesarios para poder aprender más rápido que los adultos. En cambio, los adultos no tienen la tecnología de estos tiempos actual como los: computadores, celulares, internet etc. Los adultos podr poder encontrar información cuando niños tenían que buscar en libros, ir a bibliotecas, conseguir la con su computadora y tomando en cuenta que los derechos del niño todavía a algunos adultos no existía, así que todo lo arreglaban a castigos físicos y algunos adultos, por que la sociedad en ese tiempo estaba mal, no querían estudiar y acababan el 4to medio. Ahora lo que quieren los adultos para los niños es que sean mucho mejor que ellos para que salgan adelante y cambien el mundo, para que sea mejor de lo que es ahora y que ellos se sientan orgullosos y también para que ellos se sientan bien de lo que

Annotations:
 - "me" (margin)
 - "en sus trabajos" (margin)
 - "no segundos" (margin)
 - "FRASE explicati entre coma" (margin)
 - "punto seguido" (margin)
 - "sin coma" (margin)
 - "punto seguido" (margin)

Figure 1. Types of students' orthographic mistakes
 Source: Own work.

mejores vidas, por lo tanto los adultos tienen las mismas capacidades que un adolescente. Los jóvenes de hoy en día desprecian las oportunidades, ya que se les entrega un montón de requisitos, los adolescentes piensan que las oportunidades se dan siempre como facilidades. Esto igual trae ventajas, ya que algunos tienen busca oportunidades para ellos mismos, como intercambio con otros jóvenes de otros países ¿Para que buscarían intercambios? Para hacer más fácil el aprendizaje del idioma extranjero y esto les trae oportunidades de trabajo o carreras universitarias en otros países.

Annotations:
 - "punto seguido" (margin)
 - "FRASES explicativas entre comas" (margin)
 - "minúscula después de coma" (margin)
 - "punto final" (margin)

No estoy de acuerdo, ya que tanto las personas, independientemente de las edades, tienen las mismas capacidades de aprendizaje. Solo que el problema de los adultos es no crece en ellos mismos, no aprovechan las oportunidades que se les entrega para facilitarles la vida, pero como ellos ya tienen sus vidas hechas solo piensan en su familia, no piensan en los beneficios que se les pueda entregar gratuitamente, como un título y se sientan orgullosos de sí mismos. Pero, ¿que hacemos para incentivar a los adultos? Entregamos folletos de chales para incentivarlos a ellos mismos y ayudarlos también con sus problemas personales, esto sirve para ayudar al país a tener más posibilidades de

Figure 2. Types of students' orthographic mistakes
 Source: Own work.

We separated the investigation into two study stages (See Figure 1). The first stage was for diagnostic and covered the first essay and the submission of the second. Then, the second stage was for treatment, which began with the correction of the second essay through the last one.

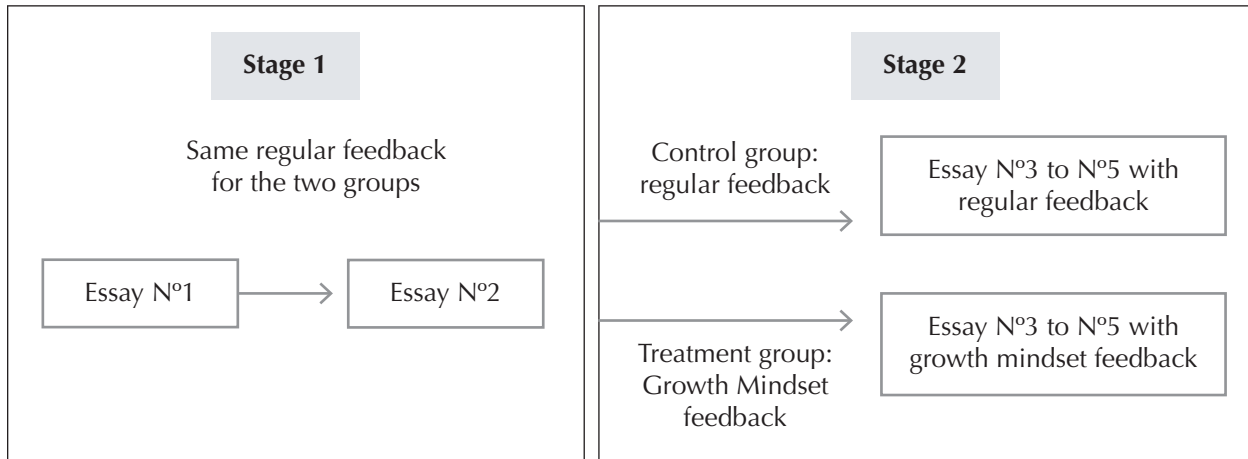


Figure 3. Diagram of experiment stages

Source: Own work.

The students wrote the first essay, and we corrected it, providing the same regular and traditional feedback to both groups to assess their initial writing levels. That decision was made to give personalized feedback to the growth mindset group for essays 2 to 5 (we first needed to know which mistakes each student was committing so we could positively challenge them in those areas).

Once the students reviewed their regular corrections, they wrote the second essay. With the revisions of the second essay the treatment stage began. We assessed this new composition by differentiating the feedback provided: the control group received the same type of input that they obtained in stage 1, but the treatment group received growth mindset feedback that was highly personalized, which allowed for broad monitoring of the performance of each student.

Hence, the assessment of the second essay for the treatment group was aimed at giving them confidence and assuring them that making spelling mistakes was not only allowed but even encouraged in order to improve because errors lead to enhancement when there is effort involved (Dweck, 2006; Brock & Hundley, 2016). In this manner, we adopted a constructivist point of view and share the vision of Díaz (2010) when she emphasizes that from a constructivist vision

“a new conception of error arises, which is not understood in a negative way, but as a sign of a system that must be analyzed to discover its logic. Thus, the orthographic error becomes a source of information, recognition of learning processes, an object of study that can contribute to the learning itself. Therefore, the evaluation of error is the motor of learning (p.66).

The following comments are examples of the growth mindset feedback provided in the second compositions to the treatment group:

Example 1: “We are glad that you made some orthographic mistakes because it is an opportunity to learn. Errors are welcome in this workshop! ... Since most of your mistakes are related to accentuation, we are going to focus on working with the tildes”.

Example 2: “We are sure that you can improve with effort and dedication. If you ever think it is very difficult not to make mistakes, remember that it is difficult not to make mistakes yet. This is a process and therefore requires time. Let’s work on your punctuation marks, specifically in the use of the comma”.

In the subsequent three writing tasks, the control group received its regular style of feedback. The treatment group, however, received feedback that proposed challenges related to their own mistakes. These challenges were concrete and only one at a time so that students would not feel overwhelmed. Additionally, in this stage, the growth mindset feedback focused on showing evidence of the students’ progress. The following extracted examples depict it:

Example 1: “Such an incredible job! Did you see your progress? If you notice, in the past assignment you had 12 tilde’s errors, and now you have only 5. That’s a breakthrough. Do you see that with effort everything can be done?”

Example 2: “As most of your orthographic mistakes are related to the accentuation of ‘esdrújulas’ words, we want to make you a special challenge. We challenge you that in your next submission you have less than five faults accentuating ‘esdrújulas.’ We know that you can achieve it because you have already demonstrated that you could decrease mistakes related to ‘agudas’ words”³.

Results

At first, we compared the number of errors in the three orthographic categories by the two groups. And we found that one student in the control group was committing twice as many mistakes as the rest. Thus, we decided to exclude him as an outlier, although he continued participating in the writing workshop.

Regarding attrition, one student from each group left before submitting the second essay, two more in the control group left before the third essay, and one more from the control group did not present the last essay. Therefore, we ended up with 11 students in the control group and 14 in the treatment group. It is worth noting that the only student who left the treatment group quit before receiving a growth mindset feedback and one could interpret that the abandonment of the students within the control group might be related to lack of motivation because they were not being challenged and they did not receive growth mindset feedback regarding their writing.

Since the sample is rather small, our results are not conclusive but are encouraging about the usefulness of implementing a growth mindset technique for language teaching, particularly in orthography.

The comparison presented in Table 1 shows the number of mistakes committed by students in the final samples before the treatment. As is reflected, on average the control group made more mistakes than the treatment group, so our emphasis was on assessing the progression in the errors in the subsequent stages. Also, the data shows that the more significant number of mistakes were in accentuation, followed by punctuation, and then literal mistakes. These findings agree with what Backhoff et al. (2008) and Sotomayor et al. (2017) also found in investigations that studied orthography, but that involved elementary students in México and Chile respectively, where the accentuation errors were the most frequent too, specifically the lack of tildes marks.

3. In Spanish language, esdrújulas words are those whose accent falls on the third to last syllable. These always have a tilde (e.g. música, rápido, pájaro). The agudas words should be stressed on the last syllable, and they have tilde when they end in “n”, “s” or any vowel (e.g. ratón, comió, compás).

Table 1. Average mistakes in essays 1 and 2, before treatment

Group	Statistic	Accentuation	Literal	Punctuation
Treatment	Average	5.9	3.3	4.4
	Mac	11.0	6.0	7.0
	Min	1.0	1.0	2.0
	Students with 3 or less mistakes	4.0	0.0	0.0
	Standard Deviation	3.2	1.4	1.4
Control	Average	8.8	5.2	5.4
	Mac	15.0	16.5	10.5
	Min	2.0	1.5	2.0
	Students with 3 or less mistakes	2.0	0.0	0.0
	Standard Deviation	4.6	4.1	2.5
Total	Average	7.4	4.2	4.9
	Mac	15.0	16.5	10.5
	Min	1.0	1.0	2.0
	Students with 3 or less mistakes	6.0	0.0	0.0
	Standard Deviation	4.2	3.0	2.0

Source: Own work.

After the experiment, the results show that the students in the treatment group reduced their number of mistakes on average in the three categories, although in punctuation the improvement was marginal. While in the control group the numbers of errors remained constant in accentuation, increased in literal mistakes and fell in punctuation.

Moreover, it is interesting to see that among the treatment group, seven students made less than three accentuation mistakes on average on the fourth and fifth essays. Additionally, one student committed less than three literal and three punctuation mistakes in the treatment group, while in the control group no change was found on the number of students with few errors in any of the three categories.

Table 2. Average mistakes in essays 4 and 5, after treatment

Group	Statistic	Accentuation	Literal	Punctuation
Treatment	Average	4.7	2.4	4.0
	Mac	11.0	7.5	11.0
	Min	1.0	0.0	0.0
	Students with 3 or less mistakes	7.0	1.0	1.0
	Standard Deviation	3.3	1.8	2.5
Control	Average	8.8	4.9	5.0
	Mac	13.0	10.0	9.5
	Min	2.5	0.5	1.0
	Students with 3 or less mistakes	2.0	0.0	0.0
	Standard Deviation	4.3	3.3	2.5
Total	Average	6.4	3.4	4.4
	Mac	13.0	10.0	11.0
	Min	1.0	0.0	0.0
	Students with 3 or less mistakes	9.0	1.0	1.0
	Standard Deviation	4.2	2.7	2.5

Source: Own work.

As was mentioned, these results might not be decisive due to the size of the sample, though improvement in accentuation in the treatment group (measured as the difference in errors between the essays 1 and 2 and essays 4 and 5) is statistically significant at 5% confidence (SD: 3.4, *p-value*:0.032).

The following graphs summarize the trends of the errors committed by the students in both groups and the average difference in the number of errors in each essay.

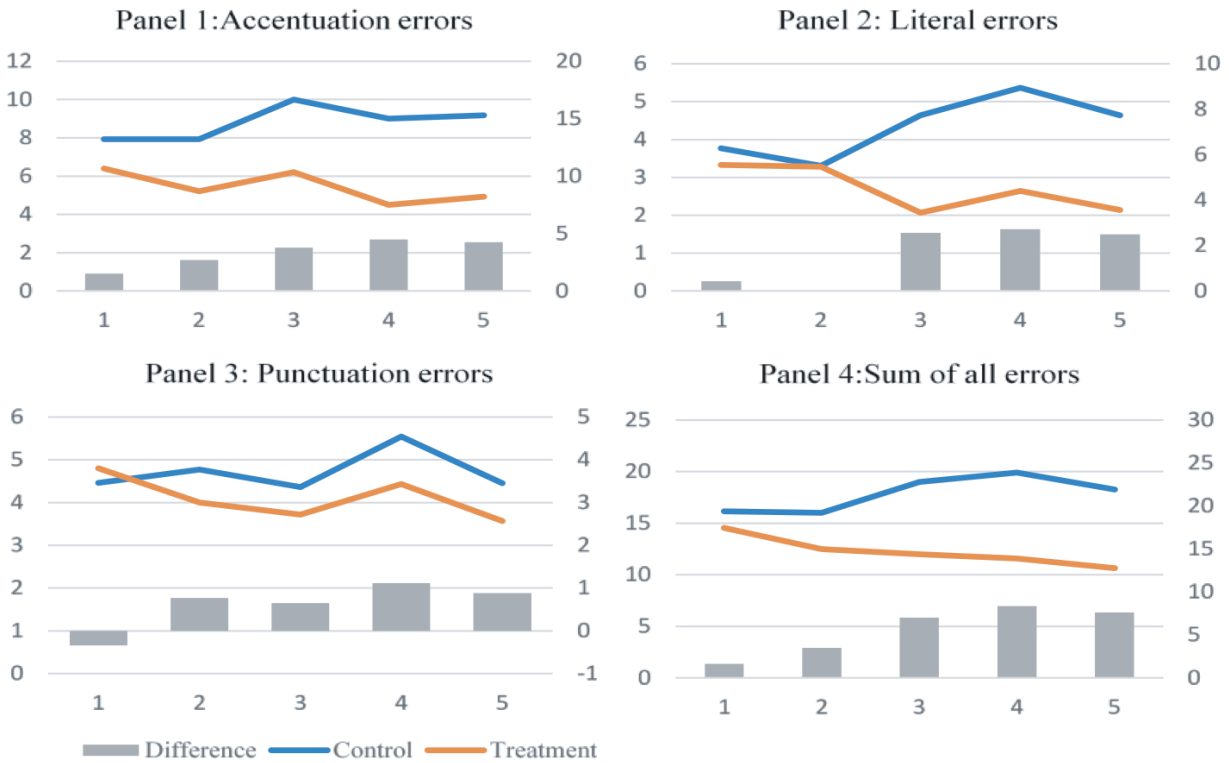


Figure 4. Progression of control and treatment group per essay by type of error

Source: Own work.

As is clear, the difference between the average number of errors in the two groups increased for accentuation errors and literal errors after the second essay, and that the treatment group had, on average, fewer mistakes in the three categories in the last essay than in the first, which did not happen for the control group. Moreover, the workshop seems not to have improved the orthographic skills of the students in the control group.

Conclusions and Further Research

This preliminary study has demonstrated that growth mindset feedback might be a valid practice for other knowledge areas besides math and science, and it would be interesting to see if the results are similar in other subjects, such as history, or in different languages besides Spanish. Additionally, it would be useful to conduct studies that allow us to see if this type of feedback has positive effects in other writing areas, such as grammar. The theory supports that it should help, and our preliminary results are promising.

We recognize that our sample was small; therefore, further research should expand it, probing this type of feedback with more subjects. In addition, it would be valuable if future investigations consider other relevant variables, such as the socioeconomic groups, the subject's gender, or their self-efficacy perception regarding spelling.

As a first approximation to a growth mindset framework in teaching writing, this study shows the potential and promising positive impact that this approach has addressing spelling issues in high school students, since most of the existing studies have focused on observing the orthographic problems of elementary and middle school students, leaving aside secondary students.

The literature and the results of this exploratory study guide us to think that one of the reasons related to the improvements achieved by the experimental group was the customized feedback and challenges associated with their own errors. The authors believe that it is useless to correct and indicate where the mistakes are if students do not know what to do with them later. Just pointing where a tilde is missing or where they misspell a letter does not have major implications for students, because those corrections become only some marks on a piece of paper. Kaufman (2005) is accurate when she declares: “We have the certainty that the orthographic correction lacks value if it is not followed by later moments of reflection” (p. 12). Creating a personal challenge will invite students to review their writing and to reflect on their errors, so they become conscious of their mistakes and why they are making them.

Findings also depicted that students have more trouble with accentuation than other literal or punctuation mistakes. Just like in elementary levels, accentuation errors could be related to the intrinsic difficulties of the Spanish language alphabetic system, in which “there is no univocity between graphemes and sounds,” as Sotomayor et al. (2017, p. 329) explained.

We acknowledge that for achieving success in applying growth mindset feedback, it is crucial that teachers constantly monitor students’ progress by checking their advances in spelling in relation to their previous written compositions. Otherwise, feedback cannot be adapted if students’ spelling progress is not carefully followed. Furthermore, we saw that to maintain student motivation in spelling, teachers must support “positive attitudes toward spelling by showing students that spelling is personally important to them” (Graham, 1983, p. 563), an attribute that growth-mindset feedback allows.

Thereby, this study proposes that instructors should provide feedback that promotes a growth mindset when they are appraising spelling skills. That input should be personalized, well documented, and one that encourages endeavor and constantly shows progress. While conducting this study, we recognized the extended time that growth mindset feedback demands, and we are aware that teachers lack time. Thus, in order to bring this study to the classroom, we suggest that it would be very helpful to developing software that optimizes the process. There are frequent mistakes regarding spelling that students continuously make; therefore, having software with pre-made written feedback comments that boost growth mindset may be highly useful for teachers.

In accordance with the above, we recommend that governments promote policies that include a growth mindset framework within the teacher training programs. In Chile, for instance, the courses implemented by the Center for Perfection, Experimentation and Pedagogical Research (CPEIP, for its initials in Spanish), should incorporate a growth mindset feedback approach in its assessment curriculum. In addition, there are private institutions that conduct workshops related to teachers’ professional development and that receive public funding due to their social contribution. Those institutions should involve a growth mindset framework in their training as well. For example, in Chile, many of those organizations that have been classified as Educational Technical Assistance services (ATES, for its initials in Spanish), are paid with public funds by schools. Thus, we encourage these organizations to foster growth mindset programs in order to connect this theory with the practice.

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Annex

Table 3. Improvement in treatment group per observation

Observation	1 and 2	4 and 5	Difference
1	10	3.5	6.5
2	8.5	9.5	-1
3	5.5	2	3.5
4	4	4	0
5	3	1.5	1.5
6	1.5	1.5	0
7	7	3	4
8	6	2	4
9	3	1	2
10	11	8.5	2.5
11	5	11	-6
12	6.5	8	-1.5
13	1	4.5	-3.5
14	10.5	6	4.5
Mean	5.893	4.714	1.179
SD	3.247	3.321	3.412

Source: Own work.

Annex 2

Category	Questions	General textualities (young people)	Core ideas
Digital native	1. How would you define digital natives?	Individuals who, without previous training, make fuller use of systems than would be expected by an average user (G1).	Young people who know about technologies and how they work better than the average user. Due to this condition they are more tolerant and inclusive and reflective about the topics of their practices.
		Individuals who have had access to technology since they were born (G2).	
		Generation that was born after digital technologies came into existence. They have been able to access them without problems and grew up/developed at the same time as they were evolving (G3).	
		Individuals born after digital technologies became widely available and were accessible to normal people (G4).	
		People born in the era of digital technology (1980 and after) and which are familiar with and naturally interested in this culture (G5).	
		Individuals born in recent years with all of the new digital developments (G6).	
		They are people who are more inclusive and tolerant, due to the large amount of information to which they are exposed and which allows them to reflect better on various topics (G7).	
		Young people (up to 40 years of age) who are interested in keeping up to date with technological advances (G8).	
		Individuals who have mastery and high levels of knowledge about digital media (G9).	
		They know and practice the English language as part of the conditions of their game-playing activities (G10).	

Example of interview matrix for young people

Note: G = Gamer or videogame player.

Source: Prepared by the author.

Category	Questions	General textualities (young people)	Core ideas
Digital native	How would you define digital natives?	They are the people who, in relation to their current age, have been raised within the current period of technological evolution (P1).	They are a generation of individuals whose situations and living spaces are mediated by technologies. Therefore, it is not needed to teach them anything because they are competent, even more so than some of their teachers.
		Their context is technology, especially the internet and its devices, with which they build their normal relationships (P2).	
		They are always in communication, they are always in communication because they always play a lot online (P3).	
		They were born into the digital age, the digital era, they no longer need to be taught anything that has to do with technology. They know it by nature (P4).	
		The digital native is constantly developing with technological devices: mainly cell phones, internet, online games (P5).	
		They use technologies much more efficiently than the teachers (P6).	
		They have photo applications that teachers often don't know about. They teach us certain things (P7).	
		They have greater interest and are quicker in searching for information, they are familiar with the technologies, because they always look for lots of other tools that can serve them for various purposes (P7).	

Example of interview matrix for teachers

Note: P = teacher.

Source: Prepared by the author.