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NICOLLY GOUVEIA CORREIA DE FREITAS

TESTING THE EFFECTS OF TASK-COMPLEXITY AND INSTRUCTION ON LEARNER'S IMMEDIATE INPUT INCORPORATION OF A TARGET FORM

JOÃO PESSOA
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Trabalho de Conclusão de Curso, apresentado como requisito para a obtenção do grau de Licenciatura em Letras (Inglês), pela Universidade Federal da Paraíba. Orientador(a): Profa. Dra. Juliana Luna Freire

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BANCA EXAMINADORA

Profª. Dra. Juliana Luna Freire
Orientadora - Centro de Ciências Humanas Letras e Artes

Profª. Dra. Elaine Espindola Baldissera
Membro da banca- Centro de Ciências Humanas Letras e Artes

Profª. Dra. Francieli Freudenberger Martiny
Membro da banca- Centro de Ciências Humanas Letras e Artes

Profª. Dra. Bárbara Cabral Ferreira
Suplente da banca - Centro de Ciências Humanas Letras e Artes

AUTHOR NOTE

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RESUMO

Esta pesquisa adota um processo metodológico de pré-teste e pós-teste. A pergunta de pesquisa que guia o presente estudo é a seguinte: estudantes intermediários de inglês, ao serem expostos a uma tarefa complexa exigindo níveis altos de processamento de informação, mostram incorporação imediata do input depois de passar por instrução explícita da forma-alvo? Para verificar os efeitos da instrução, estudantes de dois grupos diferentes de aulas de conversação em inglês participaram do estudo. A análise dos dados seguiu uma abordagem qualitativa, baseada na Hipótese da Cognição (ROBINSON, 2003); conceito de Foco na Forma (LONG; ROBINSON, 1998) e a teoria do Output (SWAIN, 1985). Swain define *output* compreensível como aquele que estende o repertório linguístico do estudante à medida que ele/ela tenta criar precisamente e apropriadamente o significado desejado. (SWAIN, 1985, p. 95). A Hipótese da Cognição (2003) sugere que ao aumentar a demanda cognitiva das tarefas pode promover uma alta atenção direcionada ao input e memorização. A incorporação de novas formas em tarefas complexas acontece efetivamente quando os aprendizes focam na forma. Os objetivos específicos do presente estudo são: a) testar estratégias de percepção de foco na forma; b) comparar a performance dos estudantes na escrita antes e depois do procedimento de tratamento que trabalhou especificamente com instrução explícita; c) relacionar a performance pós-teste dos estudantes com as bases teóricas adotadas no presente estudo. Assim, os resultados do presente estudo indicam a incorporação da forma alvo em uma tarefa escrita após instrução explícita.

Palavras-chaves: Aquisição de segunda língua; Output; Input; Instrução

ABSTRACT

This research adopts a pretest/posttest design with treatment and control groups. The research question that guides the present study is the following: Do intermediate students of English, by being exposed to a complex task requiring high levels of information processing, show immediate incorporation of input after explicit instruction on the target form? To verify the effects of instruction, L2 students from two different groups of English Conversation classes took part in this study. The analysis of the data followed a qualitative approach, based on the theoretical work of the Cognition Hypothesis (ROBINSON; 2003), the concept of Focus on Form (LONG; ROBINSON; 1998), and the Comprehensible Output Theory (SWAIN; 1985). Swain defines comprehensible output as the output that extends a learner's linguistic repertoire as he/she attempts to create precisely and appropriately the meaning desired (1985, p. 295). The Cognition Hypothesis suggests that increasing the cognitive demands of tasks may promote high attention to and memory for input. The incorporation of new forms in complex tasks happens effectively when learners *Focus on Form*. The specific objectives of the present study were a) to test noticing strategies focused on form; b) to compare student's performance in writing before and after the treatment procedure that worked specifically with explicit instruction; c) to relate student's post-test performance with the theoretical basis adopted in this study. Thus, the results of this study indicate the incorporation of a target form in a written text by intermediate speakers after explicit instruction.

Keywords: Second Language Acquisition, Output, Input, Instruction.

TABLES

ABBREVIATIONS

GMO - GENETICALLY MODIFIED ORGANISM

TG - TREATMENT GROUP

CG - CONTROL GROUP

S1 - STUDENT 1

S2 - STUDENT 2

S3 - STUDENT 3

S4 - STUDENT 4

SUMMARY

1. INTRODUCTION

A common and often claim raised by intermediate non-native English speakers is the difficulty in advancing from intermediate to advanced level of speaking abilities. As Merrill Swain and Sharon Lapkin once stated, specifically about learners of French, but applicable to other languages learners, “Somewhere along the way to target-language proficiency, when the ability to understand and be understood is achieved, the students' second language development appears to slow down, and the push to develop their French beyond its current state diminishes.” (SWAIN; LAPKIN; 1995). Teaching conversation classes for the past two years has given me the opportunity to observe how a student's linguistic repertoire doesn’t seem to improve and stretch from intermediate to advanced only by speaking. Throughout the lessons, they kept using the same expressions, the language structure in their speech didn’t seem to vary to more complex structures; moreover, when asked to discuss a topic that wasn’t within their linguistic domain, students struggled to find words and expressions needed to communicate their message.

At first, as a teacher, I believed that pushing speaking was the way to get them to stretch their interlanguage system and solidify new expressions. Indeed, as a teacher and researcher, I believe that output, according to Merrill Swain’s hypothesis, is the key to successful language development: “The output hypothesis is that even without implicit or explicit feedback provided from an interlocutor about the learners’ output, learners may still, on occasion, notice a gap in their own knowledge when they encounter a problem in trying to produce the L2” (Swain, 1995, p. 373). Students indeed noticed problems in their linguistic repertoire when trying to communicate meaningfully and appropriately. I noticed this phenomenon every time they stopped speaking to ask “how can I say…..in English?” or when they modified their initial output. According to Swain and Lapkin (1995), identifying their linguistic gaps is the first function of output that promotes language development. The other two functions are the following: (1) testing of hypotheses to negotiate meaning, and (2) drawing learners’ attention from the semantic processing prevalent in comprehension to the syntactic processing needed for production (SWAIN, 1985). These last two will be further explained and discussed in the theory review. According to what was said, output leads learners to notice gaps in their linguistic system. When faced with this challenge, they try out hypotheses to get their message across. However, how can we be sure that they are learning the appropriate linguistic structures to communicate in different contexts and using a varied

range of structures? Is noticing enough to incorporate new linguistic features into their repertoire?

Taking these experiences into account, this study explores the hypothesis that one effective way to promote language development is by using explicit Second Language (henceforth SL) instruction. Therefore, the present study focuses on the effects of explicit instruction on learner's output. Based on the theory previously explored by Swain and Lapkin (1995), I argue that output leads learners to notice gaps in their interlanguage system; and, in a classroom setting, I question how we can provide students with rich input and effective instruction that will lead them, autonomously, to produce accurate speech. This particular attention to accuracy is favored by the complexity of the target task applied in this study. According to Robinson (2003), increasing the cognitive demands of L2 tasks will increase the chances of attempting to aspects of input. But, ir order to process the semantic content of complex tasks and draw learners' attention to aspects of L2, focus on form is necessary: "In addition to the demands tasks make on processing meaningful semantic and conceptual communicative content, Focus on Form will also be necessary, and this will be most effective in facilitating noticing of input made salient on complex tasks" (ROBINSON, 2003, P. 54).

Thus, the research question that guides the present study is the following: Do intermediate students of English, by being exposed to a complex task requiring high levels of information processing, show immediate incorporation of input after explicit instruction on the target form? The experiment was conducted with intermediate non-native speakers of English, chosen purposefully given the fact that intermediate speakers tend to rely on their existing interlanguage system (SWAIN, 1995). Based on empirical observations, I suggest that students do not risk using more complex vocabulary and structures unless they thoroughly discuss topics that challenge them and have their attention directed to specific aspects of the L2. In order to answer the research question proposed, the present study has as its main objectives: a) to test noticing strategies focused on form; b) to compare student's performance in writing before and after the treatment procedure that worked specifically with explicit instruction; c) to relate student's post-test performance with the theoretical basis adopted in this study.

2. THEORY REVIEW

Considering what we previously introduced as theoretical approaches on Second Language acquisition and the analysis of language production and instruction on language learning, this study and its methodological principles are based on three main authors and theories: Merrill Swain's Output Hypothesis (1985), Peter Robinson's Cognition Hypothesis (2003), and Catherine Doughty's contribution on the role of instruction in Second Language learning (1991).

At first, Merrill Swain's Output Hypothesis states that output has a significant role in language development. All the functions of output lead learners to cognitive processes that are involved in SL learning. According to Swain, "one function of output is that it provides the opportunity for meaningful use of one's linguistic resources" (1985, p. 248). Consequently, by trying to use the language in a meaningful way when communicating a message, learners will notice what they know and do not know. When learners encounter these linguistic gaps, they risk words and expressions they have seen and heard somewhere that might communicate what they intend. Then, learners will attempt to produce language that is not within their comfortable and solidified repertoire. This is the second function of output, or "to try out means of expression and see if they work" (SWAIN, 1985, p. 249).

However, if this output is not followed by feedback and instruction, they will keep making the same mistakes and insisting on the language that is comfortable for them. As Swain argues,

> In order for native speaker competence to be achieved, however, the meaning of "negotiation meaning" needs to be extended beyond the usual sense of getting one's message across. Negotiating meaning needs to incorporate the notion of being pushed toward the delivery of a message that is not conveyed, but that is conveyed precisely, coherently and appropriately. (SWAIN, 1985, p. 249)

This means that speaking for the sake of speaking does not promote language development. As Swain defends, the negotiation of meaning when considering a situation of language acquisition needs to include opportunities for learners to notice and acquire the appropriate linguistic form(s) to convey their message accurately. In a study conducted to test the effects of output on noticing of a target-form (IZUMI et al., 1999), they found that the treatment group partially incorporated the target-form of the input in their immediate subsequent production. They were testing if learners would notice the gap between their interlanguage production and target-language input. In this study, we also believe that output favors noticing that leads to accurate production (modified output). However, our focus is on

testing the effects of explicit instruction in a complex task. Complex tasks followed by Focus on Form, as will be further explained, draw their attention to accuracy. Free discussions without being pushed to convey precision, coherence, and appropriateness does not take learners from intermediate to advanced levels. This theoretical argument suggests that what indeed promotes language development are the processes happening between the moments of the original output to the moment of production of the modified output. It is fair to state that when learners have the opportunity to modify their output into one that conveys their message more appropriately and precisely, as defended by Swain, it is when language development indeed happens.

As mentioned previously about the two functions of output, this is the third: "Using language, as opposed to simply comprehending the language, may force the learner to move from semantic processing to syntactic processing" (SWAIN, 1985, p.249). Therefore, this function of output explains why most intermediate students are able to understand English well, but, when attempting to speak, they do not perform as well as they would like. Thus, practicing output, whether it is written or spoken, is a way to focus on syntax and cognitive processes involved in language production. When students notice what they don't know, they might risk hypotheses. Based on these considerations, the present study analyzes the written output produced by learners in a complex task. According to Robinson: "Task complexity refers to the intrinsic cognitive demands of the task" (2003, p. 56).

As mentioned previously, this study is also a result of my empirical observations as a teacher. During the conversation classes conducted throughout the past two years, I have noticed that when students discuss topics that are comfortable for them - by comfortable I mean having the linguistic repertoire that enables them to communicate fluently about a familiar topic- they do not usually risk new vocabulary or structures and they tend to rely on what they already know. They are able to get their message across, but not as precisely and accurately as they could get. Thus, pushing learners to perform tasks that challenge them cognitively might get them to stretch their interlanguage system by incorporating new words and structures.

A theory that proposes an answer to this phenomenon is the Cognition Hypothesis by Robinson (2003). This hypothesis claims that

> increasing the cognitive demands of tasks contributing to their relative complexity along certain dimensions will (a) push learners to greater accuracy and complexity of L2 production in order to meet the consequently greater functional/communicative demands they place on the learner and (b) promote heightened attention to and memory for input, so increasing learning from the input, and incorporation of forms made salient in the input, as well as (c) longer term

> retention of input; and that (d) performing simple to complex sequences will also lead to automaticity and efficient scheduling of the components of complex L2 task performance. (ROBINSON, 2001, p.47)

These claims are thoroughly explained in the paper and related to a proposed framework for sequencing pedagogical tasks from simpler to complex tasks. Robinson's theory focuses on how tasks should be arranged in a syllabus progressively increasing their cognitive demands along the dimensions of task-complexity, and how it is involved with adult language learning. For the purpose of this study, I tried to test one of the claims of the Cognition Hypothesis, "to promote heightened attention to and memory for input, so increasing learning from the input, and incorporation of forms made salient in the input" (2003, p.47). The procedures and steps of the experiment will be carefully discussed further. The experiment was designed taking into account the claim that if a complex task challenges students cognitively and linguistically, they may need help from the input. However, the same consequence does not often happen with simpler tasks: they are able to get their message across, even though it is not done as precisely and appropriately as it could be.

We understand language acquisition from two different definitions: "as the internalization of new forms and the increase in control of forms that have already been internalized" (Nobuyoshi and Ellis (1993) apud Swain and Lapkin, 1995, p.373). In simpler tasks, learners tend to rely on what they already know. They do not feel pushed to vary their lexical and grammatical repertoire. For this study, we aim at the "internalization of new forms" as the means to second language acquisition. I believe that the complexity of the task followed by Focus on Form "paves the way" to second language acquisition.

For this reason, the discussion topic of the experiment was unfamiliar or unusual to the students. Oftentimes the topic is not within learners' linguistic domain whether because it is scientific/specialized vocabulary or it does not activate background knowledge. In the study, in order to test the acquisition of the target form, a written argumentative paragraph about the theme was proposed. Before engaging in a target-task high in cognitive demands, they were given tasks that helped them understand the theme, but their performance in these tasks was not evaluated. These "coping" tasks are what Prabuh (1987) calls pre-tasks: "the task to be attempted publicly while the term 'task' refers to what learners are to attempt on their own" (PRABHU, 1987, p.54). These tasks that helped learners understand the topic were designed taking into account the two dimensions of task complexity: 1) resource-directing, and 2) resource-dispersing, and they both relate to the complexity of the task, referring to the intrinsic cognitive demands placed upon the learner. These demands

will be established according to the manipulation of the two dimensions cited: resource-directing will refer to the elements involved in a task (if there few or many for the learner to handle); the temporality of reference (past, present or future); and the reasoning demands involved (if it requires the learner to only transmit facts [less complex] or to justify beliefs [more complex] (ROBINSON, 2001, p. 57). On the other hand, resource-dispersing tasks refers to the planning time students have prior to task performance; if it is a single or dual task (if they have to do one or two things at the same time); and the prior knowledge students have about the content of the task (ROBINSON, 2001, p. 57). These dimensions, according to Robinson (2001) are "design features of tasks and their implementation which can be manipulated to increase or lessen the cognitives demands tasks make on the learner during task performance" (ROBINSON, 2001, p. 294). For this study, the complexity of the task was raised along the resource-directing dimension. Students were supposed to write an argumentative paragraph stating their opinion about GMOs (Genetically Modified Organisms). Expressing opinions and justifying them carries a cognitive and linguistic complexity that simpler tasks do not:

> Tasks which require no reasoning and simple transmission of facts, compared to tasks which require the speaker to justify beliefs, and support interpretations by giving reasons, also require the speaker to justify expressions, such as logical subordinators (so, because, therefore, etc), and in the case of reasoning about other people's intentions and beliefs, use of psychological, cognitive state verbs (e.g. know, believe, suppose, think) which themselves require complex syntactic complementation. (Robinson, 2003, p.58)

The complexity of using logical subordinators was exactly what was analyzed in this study. The experiment was carefully designed taking into consideration two factors: attention and time. If the task was already cognitively complex, we could not take away planning time or demand performances of various tasks at the same time. According to Robinson's cognition hypothesis (2003): "Taking planning time or relevant prior knowledge away, or increasing the number of tasks that have to be performed simultaneously, simply disperses attentional resources." (ROBINSON, 2003, p. 59). These attentional aspects relate to the second dimension of task complexity: resource-dispersing. It refers to the planning time available for students to prepare for and perform the task; if it's a single or dual task; and if the task activates students' prior knowledge. (ROBINSON, 2001, p. 294). Hence, students were allowed to carry out worksheets with information about the topic and they had planning time to write their paragraphs.

By participating in this experiment, I hypothesized that learners would be pushed to modify their output in the post-test given the challenges they would face during the pre-test -being able to find the appropriate words to express their message accurately. In terms of cognitive weight, they would be forced to truly consider the pros and cons of GMOs given the fact that they had to state an opinion and justify it. In terms of the level of processing, "The greater depth of processing induced by complex task demands leads initially to more elaborative processing of input, and noticing of problematic forms in output, and subsequently to greater incorporation of input, and modification of problematic forms in the output, relative to simple task performance" (ROBINSON, 2001, p.66). Moreover, this type of task elicits the use of conjunctions that students would need in order to coherently present their opinions and connect their ideas. As they were all pre-intermediate/intermediate speakers, I expected that conjunctions such as *because, so, while*; and conjunctive adverbs such as *but, however*, *finally*, and *then* would appear in their test. As intermediate speakers, this is the type of language that they are used to and they might not risk other conjunctions and introductory phrases that can be found in more formal essays and academic tests. If they are not pushed to understand the function and usage of more elaborate conjunctions and conjunctive adverbs, they are more likely to keep using the ones they already feel comfortable with.

What has been stated leads us to the matter of focus on form. Is increasing the complexity of tasks enough to lead learners to focus on accuracy? Given this question, we tested the effects of instruction in SL development. This is the reason why this study is divided into a treatment group and a control group. We tested the effects of instruction on the post-test to check if this would lead learners to modify their output. By focusing on form, this study adopts Long and Robinson's definition of "Focus on Form": "Focus on form consists of an occasional shift of attention to linguistic code features by the teacher and/or one or more students - triggered by perceived problems with comprehension or production." (LONG; ROBINSON; 1998, p. 23). There are some other interpretations to Focus on Form, as stated by Ellis (2005), quoting Schimdt (2001), "attention to form refers to the noticing of specific linguistic items, as they occur in the input to which learners are exposed, not to an awareness of grammatical rules." (ELLIS, 2005, p. 35). During the treatment procedure, learners were exposed to authentic argumentative paragraphs. Their attention was drawn to the connectors, but they also had questions about the argument and the content of the paragraph. By using this

technique, we expected them to understand the function of the connectors and how they are used in that context.

The control group, on the other hand, was exposed to a different approach: it was entirely meaning-oriented, and they were exposed to sample texts that contained the target language, but the comprehension questions were focused on the content of the paragraphs, not the language being used. Other theorists opposing the *Focus on Form* approach have argued over a language teaching that is implicit (being exposed to comprehensible language samples with the target form) or incidental (learners are immersed in the language, and they learn while doing something else). (LONG; ROBINSON; 1998). However, research findings have stated that only meaning-oriented approaches do not guarantee successful SL learning. Swain, when studying the Second Language acquisition of students from a French immersion elementary program in Canada, stated that they perform like native speakers on global tests of listening and reading; however, they do not perform as well in speaking and writing. (Swain 1984 apud Swain 1995). Swain then suggests that being exposed and "immersed" is not sufficient for language acquisition. If this method has failed for young learners, it can be implied that it would not be an effective method to adult learners given the cognitive differences between children and adults: "Adults have no access to the innate knowledge some argue guides L1 and L2 development" (ROBINSON, 2003. p. 51). Furthermore, adults have the ability to consciously think about the language they are learning; their metalinguistic and metacognitive analysis is more developed than in children (ROBINSON, 2003).

Adding to what has been discussed, it is important to explain why the focus of form instruction was applied in a complex task. A study conducted by Kuiken & Vedder (2011) focused on the effects of task-complexity on speaking and writing performance by intermediate university students. They found that, "we have found that both in the written and in the oral mode task complexity seems to influence accuracy, as students make fewer errors in the complex task compared to the non-complex task" (KUIKEN; VEDDER; 2011, p. 101). It means that students are pushed to focus more on accurate language during complex tasks. However, this improved accuracy in complex tasks takes into account the number of mistakes (which were low), not lexical variety or syntactic complexity. "The results of our study confirm, both in the written and oral mode, Robinson's predictions regarding the effect of task complexity on accuracy, but not with respect to the effect of task complexity on syntactic complexity, or indeed on lexical variation" (KUIKEN; VEDDER; 2011, p. 102). It means that when performing complex tasks, the gain in accuracy is noticed in the decrease of lexical

errors, not in grammatical complexity (more advanced structures) or lexical variation. In this study, on the other hand, there was a gain in lexical variation in the treatment group. Due to the instructional treatment they went through, students varied their choice of connectors and introductory phrases.

This limitation in producing complex structures and a varied range of vocabulary was expected due to students' linguistic limitations. With the cognitive demands of the task being high, it was expected to see them focus on meaning and conveying their opinion, rather than on particular language features. Although organic and non-organic food is a popular topic, the implication of GMOs to the environment, human health and economy may not be. The video presented to the students contained a considerable amount of non-familiar words important for the comprehension of the subject. Therefore, it seemed too much to expect students to write an argumentative paragraph while showing lexical variety in terms of vocabulary (connectors) and structure. It was necessary to draw their attention to these particular linguistic features, so they could meet communicative demands precisely, appropriately and coherently.

3. METHODOLOGY

Eleven students from an English conversation course volunteered to take part in this study. They were chosen given their pre-intermediate/intermediate level and diverse background. The research adopts a pre/post test design and students were assigned in a treatment and control group. The treatment group was composed by students currently undertaking the 6-week English conversation course offered by the outreach program at the Federal University of Paraiba. The control group was formed by students who undertook the course in the previous semester. Initially, it was intended and planned to have six students in the control group and six students in the treatment group. It was not possible though, given the fact that some students did not show up for the second part of the study where pre and post tests were conducted. Therefore, we ended the study with four students in the treatment group and four students in the control group.

The areas of study of the students are the following: biotechnology; international relations; translation; nursery; biomedicine; accounting; computer science; and industrial chemistry. All students demonstrated previous knowledge regarding the topic of GMOs. The students enrolled in an undergraduate program in biotechnology and biomedicine showed a deeper knowledge about the issues involving GMOS. However, this did not give them any advantage on the writing of the paragraph when comparing their writing with the other students'. This helped them understand the content with more feasibility, but did not interfere in their writing skills. The level of all students were assessed taking into account my observations in the classroom (they were my previous students and current students) added to the fact that they signed up and were selected to an English conversation course targeted to intermediate speakers of English.

The experiment conducted in this study was divided into two sessions of 1.5h each. It was also broken down into six steps being four of these pedagogical steps to scaffold students into performing the target task: writing an argumentative paragraph stating one's opinion about GMOs. Firstly, I will carefully explain each step of the experiment and link those to the methodological principles taken to design the tasks. As mentioned in the theory review, the topic and target task was chosen based on Robinson's Cognition Hypothesis (2003). According to Robinson, task complexity has two dimensions: *resource-directing* and *resource-dispersing*. The manipulation of these two dimensions sets the level of complexity of the task. The experiment conducted was high in reasoning demands, since it required students to justify their opinions about GMOs, and it contained multiple elements: students had to

analyze all the pros and cons addressed in the video while choosing which point they would oppose to and what argument/s they were going to use to prove their point; the temporality of reference was low given the fact that students had to write in the present tense, but they still had to make use of subordinating conjunctions, adverbs and verbs to express belief.

In order not to harm students' performance given the high complexity in the *resource-directing dimension*, complexity was not increased in the *resource-dispersing* dimension. In other words, participants had planning time due to its implications on attention and, consequently, learners' performance:

> increasing task complexity along the resource-dispersing dimension does not direct learners to any particular aspect of language code which can be used to meet the additional task demands. Taking planning time or relevant prior knowledge away or increasing the number of tasks that have to be performed simultaneously, simply disperses attentional resources. (ROBINSON, 2003, p.59).

In order to compensate for the lack of knowledge about GMOs, students were given a vocabulary worksheet with words that would appear in the video. They were given fifteen minutes to answer the sheet and we corrected afterwards. The goal of this task was to prepare students for the video. The results of this pre-task were not used for data analysis. A second pedagogical task was applied in order to aid students with the needed information to write the paragraph. This compensated for the lack of prior knowledge about the subject matter. They were given a "pros-and-cons" worksheet. In this worksheet, they had to fill in boxes with the information from the video. While watching each argument being raised, they had to write down key words that would later help them explain what they understood. They watched each argument twice. This was thus a dual task. In order for the complexity not to harm their comprehension, they were given two minutes after each argument to write down what they understood. After the two minutes, the teacher would then ask one of the students to speak out what they understood, and check with the others if they were in agreement. It was important to make sure they understood, because they would later use this worksheet to support their view in the writing task.

These steps are called pre-tasks, according to Prabuh's view (1987), because they were done as a whole-class activity and their aim was to prepare students for what was coming - the target task. It was assumed that, given the complexity of the target task, students needed to comprehend the common vocabulary in the field to fully comprehend the pros and cons about the subject, so they could use this information to support their view. This is one of the reasons why, after watching each pro and con being raised, I stopped to check their comprehension. "The pre-task is also a context in which learners' difficulties in carrying out the required

reasoning are revealed and the teacher is able, in response, to engage in appropriate interaction, breaking down the effort needed into smaller steps and, in the process, making public the procedures to be employed" (PRABHU, 1987, p. 54). None of the pre-tasks revealed the procedures to write the paragraph because they were not told they would eventually have to write, due to research implications. However, it was a context in which their difficulties in comprehending the subject were revealed and dealt with beforehand.

After the pre-tasks were applied, they were ready to write the paragraph (pre-test). A handout was given with a statement about the topic: “GMOs are harmful to human health.” They had to decide if they agreed or disagreed with this statement and then write a paragraph stating their view. They could use the worksheet during this time. Fifteen minutes was the time given for students to write their paragraphs. At this stage, I was interested in checking how they would structure their paragraphs and the types of conjunctions they would use to link clauses. They were asked to firstly present an opposing point-of-view to their view; to present their view and support it; and, finally, to affirm their position. This type of task demands the learner to link cause and effect. In order for their paragraph to be appropriately and accurately written, they had to link independent clauses, so they could state their point. They needed conjunctions to focus on the cause and the effect. Their choice of conjunctions was, as expected, drawn towards the most common learned at the elementary to intermediate level: *and, or, however, but, so, in conclusion*, etc. This type of task has high reasoning demands: it makes the learner look for appropriate language to meet the cognitive demands of the task. As will be demonstrated in the data analysis, learners stated opposing claims and their point-of-view, but they could have done it more accurately and precisely. In order to do this, they needed to look at examples of the same linguistic context they were required to produce; also, due to the cognitive complexity of the task, focusing on form was necessary to draw learners attention to such features.

This stage was designed to bring learners attention to the input, and was called *After Writing*. Both the control and treatment groups passed through this part, but the attention of those in the treatment group was drawn to particular features of English. More specifically, they were presented to the connectors and introductory phrases used in formal texts to express contrast, add arggument and state concluding sentences/ideas. On the other hand, those in the control group were directed to the content of the paragraph samples. The comprehension questions below each paragraph were not focused did not focus on the connectors being used or on the relationship of dependent/independent clauses. They drew learners' attention to the

writer's point of view, the arguments being raised and what they understood about the topic. The paragraphs were the same for both groups, but the control group received slightly longer versions so they could understand the writers' perspective and discuss it. Therefore, they had higher cognitive demands than those in the treatment group. We decided to apply these two different strategies so the effects of instruction could be tested. According to Robinson:

> in addition to the demands tasks make on processing meaningful semantic and conceptual communicative content, Focus on Form (FonF), i.e., selective attention to such forms in communicative context (Doughty & Williams, 1998; Long, 1991, 1996; Long & Robinson, 1998; Muranoi, 2000; Philp, 2003), will also be necessary, and this will be most effective in facilitating noticing of input made salient on complex tasks, since these require greater mental and communicative effort, depth of processing, and so greater attentional and memory resource allocation to input, than simpler tasks. (ROBINSON, 2003, p. 54)

It means that, when learners are challenged by complex tasks, they have to direct part of their attention to processing of semantic communicative content. Thus, they might not notice particular language features in the input that would be important in order to produce an accurate speech. Hence, focus on form is necessary to draw their attention to these particular language features. They will be made salient by focusing on form. As defended byRobinson (2003) and Doughty (1991), among others, and as previously stated as one the hypothesis of this study, focus on meaning alone is *not enou*gh to achieve proficiency and produce both fluent and accurate speech. Due to this reason, the *After Writing* stage focused on briefly drawing learner's attention to particular language features: introductory phrases, coordinating conjunctions, and conjunctive adverbs. This focus on form was also supported by one the methodological principles raised by Doughty and Long (2003), which were designed to instruct and guide the design of TBLT (task-based language teaching) syllabus design. As defended by these authors, "Methodological principles are putatively universally desirable instructional design features, motivated by theory and research findings in SLA, educational psychology, and elsewhere, which show them to be either necessary for SLA or facilitative of it" (DOUGHTY, LONG, 2003, p.51). They are not the pedagogical procedures, but they guide the design of such procedures.There are in total 10 principles, but not all of them were adopted in this study. In this study, they helped to guide the instructional design of the *After Writing* stage. For the treatment procedure (*After Writing*), two principles were considered: Methodological Principle 6, *Focus on Form* (MP6), and Methodological Principle 4, *Provide Rich Input* (MP4). After writing the pre-test, they were told they were going to read examples of paragraphs stating one's opinion about GMOs. They were all authentic data --all the paragraphs were taken from scientific articles about the topic. This was done with the

intention to show them real-life examples of the target task. By analyzing these articles, I noticed a pattern on the type of linking words used to state one's opinion coherently and accurately. Regarding MP4, Doughty and Long state: "Adult foreign language learners require not just linguistically complex input, but rich input (i.e., realistic samples of discourse use surrounding NS [native speaker] and NS-NNS [native speaker- non-native speaker]accomplishment of target tasks)." (2003, p.61). It means that the type of language presented in a textbook should be authentically based on real-life examples of native speakers and proficiently non-native speakers performing the target-task in real life. These examples should not be sequenced in terms of linguistic complexity (from the easiest to the most advanced structures) but they should vary in quality, quantity, authenticity and relevance.

Thus, the A*fter Writing* stage consists of three substages: first, they read the paragraphs and answer the questions about each paragraph. It was done as a whole class activity. The researcher read the paragraphs, gave them time to answer the questions and corrected right after to check their comprehension on the usage and function of the particular language features. They were exposed to nine different examples of argumentative paragraphs. After that, they were given time to silently answer a second exercise in which they had to fill in blanks with the conjunctions and adverbs they had just learned about. It was then corrected, and we moved on to the third and last substage: paragraph guideline. At this point, students in the treatment group had to assign each of the conjunctions, introductory phrases and adverbs according to their function.

After the treatment procedure, all handouts were collected and they were told to write a second argumentative paragraph, now stating their opinion about a different statement related to GMOs. They were *not* explicitly told to use the conjunctions and adverbs learned. However, as will be shown in the data analysis, all students in the treatment group used some of the language features learned to structure their paragraphs. The control group, on the other hand, did not go through a treatment procedure (*Focus on Form*). They were given the same nine examples of paragraphs, but longer versions of the paragraphs. This had to be done due to the aim of the exercise. It was not focused on form, so they had to read and comprehend the argument and specific information being raised in the paragraph. If the short versions of the treatment group were used with the control group, it would make interpretation harder due to the lack of information. Also, only two paragraphs were different from the treatment group due to the same cause. The same paragraphs in the treatment group were taken from the bottom lines of some paragraphs. If I had used the whole paragraphs with the control group,

they would have to process a lot more text than the treatment group. They were exposed to the same introductory phrases, conjunctive adverbs as the treatment group, though.

Finally, the last stage of the experiment was the post-test. Both groups were given the same handout, but this time with a different statement about GMOs and they had no brainstorming tool. All students in the treatment group and control groups finished this part faster. They did not use the entire fifteen minutes given to write the paragraphs. After handing back all the worksheets, the experiment was over. Afterwards, it was asked why they wrote faster and they said that the examples helped to comprehend the topic and state an opinion. All students in the control group finished before time was over and raised the same claim, but they did not show any usage of the connectors and introductory phrases they were exposed to in the input. This will be further shown and explained in the data analysis.

4. DATA RESULTS AND ANALYSIS

In this paper, I adopted a qualitative approach to the analysis of students' writing performance in the pre and post test phases. I will compare their performance before and after the treatment procedure, and I aim at identifying the use of conjunctive adverbs and introductory phrases in the post-test caused by the effects of Focus on Form techniques applied in this study. Thus, I hope to provide evidence for the effects of Focus on Form and task complexity on the immediate incorporation of the particular language features mentioned above.

During the analysis, I carefully read and analyzed the argumentative paragraphs of both groups in order to identify if students applied the conjunctive adverbs and introductory phrases in their post-test as a way to coherently and precisely structure their paragraphs and thoughts. First, I compared how students in the treatment group performed in the pre-test. Then, if there was any occurrence of the conjunctive adverbs and introductory phrases targeted during the *After Writing* stage. I contrasted their pre-tests to their post-test, and the analysis of the data suggests that the treatment procedure had an effect on participants' writing performance. It points to the occurrence of the target-form and the number of clauses per period; the latter implies the length of the sentences in students' texts. During the post-test, with the use of the target form, they were significantly smaller. The implications of these findings will be carefully discussed below.

I followed the same analytical procedure for the control group. Students in the control group were only being pushed to incorporate new input by the complexity of the task. Therefore, I drew general implications to the findings of both groups. What follows is a table with the comparison of occurrences of the target-form in both pre and post tests. The first table refers to the results of the treatment group. Students' names are reserved and they will be identified as: TGS1, TGS2, TGS3, and TGS4.

TABLE 1 - Treatment group
Student's choice of linking words before (pre-test) and after (post-test) the treatment procedure

STUDENTS	PRE-TEST	POST-TEST
TGS1	First of all (1x) But (3x) Because (1x) Besides that (1x) And (13x) Though (1x) Even (1x) To support my argument (1x)	It has been argued (1x) Yet (1x) Despite that (1x) In addition (1x) Therefore (1x) And (4x) But (1x)
TGS2	But (1x) Although (1x) So (1x) In conclusion (1x) Such as (1x) Because (1) And (2x)	It has been stated that (1x) However (1x) Because (2x) And (2x)
TGS3	Some may say that (1x) Because (3x) In my opinion (1x) So that way (1x) But (1x) As (2x)	It has been stated that (1x) However (1x) And (1x) As (2x)
TGS4	I disagree (2x) But (1x) Because (1x) On the other hand (1x) So (1x) And (3x)	I agree (1x) Despite (1x) However (1x) Yet (1x) And (2x)

By observing the occurrences of subordinating conjunctions and in their pre and post tests, findings show that all students in the treatment group incorporated at least two of the conjunctive adverbs made salient in the input (paragraph examples). Therefore, the effects of instruction can be validated on the immediate incorporation of input in a complex task. Some general implication on students can be drawn: Firstly, 3/4 students used the same introductory phrase to begin their paragraph (it has been stated). Student (TGS4) started their paragraphs

with the sentences “I disagree because” and “I agree” respectively. This seems an attempt to state an opposing claim and this student’s opinion by using the introductory phrase within their interlanguage system that seemed “enough” to get the message across.

There was another attempt made by student TGS3 to use an introductory phrase to state the opposing claim: “Some may say that”. This student felt the need to use a sentence to state the opposing claim and used what was within their interlanguage system to meet the demands of the task. After learning a different way on how to properly state an opposing claim, based on real-life examples of paragraphs from scientific articles, this student changed their choice to the one that was noticed during the treatment procedure - in which the linguistic feature was made salient. “Some may say” was replaced with “It has been stated” in the post-test. Secondly, it is fair to make an observation on student TGS1 performance in the post-test. The text written by this student was not just a paragraph. It was more extensive than all other students in the treatment and control group. This student was aware of the instructions, but made a deliberate choice to write more. Given this observation, it can be implied that the use of more conjunctive adverbs was caused due to more opportunities of use; at the same time this student argued about the statement in a deeper way than the others. Based on my empirical observation in the classroom, the proficiency level of this student was also higher than the others.

Thirdly, I would like to point to the number of occurrences of, specifically, three subordinating conjunctions in the pre and post tests. According to The Common European Framework of Reference for Languages (**CEFR**), the most frequent subordinating conjunctions such as *and, but, because,* and *o*r are included in the syllabus since the A1 level. It means that students learn to establish cause-effect relations from the beginning of their studies. That being said, it was expected to see students make use of such subordinating conjunctions. The conjunctive adverbs, adverbs and introductory phrases are usually learned as students move forward and start to have contact with advanced texts that incorporate these conjunctions and the type of introductory phrases pointed out in the treatment procedure; or, when they learn them through explicit instruction, such as in this study.

After careful analysis of the tests, these are the subordinating conjunctions that appeared: *but, and, because, so, as, although,* and *though*. The last two only appeared in the pre-tests by the most proficient students in this study. The subordinating conjunction “but” appeared in all pre-tests at least once. Students received the instruction that they had to mention an opposing claim to their point of view. In order to meet this communicative

demand set by the task, they used *but* to introduce their points of view. After the treatment procedure, 3/4 of the students introduced their point of view using "however" which was one of the conjunctive adverbs noticed during the instructional treatment. TGS1 used *yet* to introduce her point of view against the opposing claim. When *yet* is used as a conjunction and starts the contrasting sentences, it is not necessary to add a comma right after it. However, TGS1 used a comma right after *yet*, as she would have used for but. It implies that she understood that *yet* could be used to contrast two ideas, and applied the same punctuation rule used for *but*.

The conjunction *Because* was used at least once in all pre-tests. Student TGS3 used it three times. It is also valid to point out that this same student used "*As*" two times to connect a cause with a result; once in the post-test and for the second time in the pre-test. This student was the only one both in the pre and post-test who used *As*, which shows that it is not so common among students as it is to connect cause and effect with *because*. Based on the data collected, *And* was the conjunction most used among students. It was used in all students' pre and post tests, except for student TGS3 who did not use it during the pre-test. It continued to be used in the post test with the same frequency because, during the treatment procedure, they did not learn any conjunction that could replace *and* as they did conjunctive adverbs that connect contrasting ideas and introduce initial and concluding sentences. Thus, it is expected to trace this conjunction being used in both tests. Now, we will move on to some of the usages of *So*.

During pre-tests, all students used *So* to introduce clauses of result. Except for student TGS1. It is fair to point out how student TGS4 used this conjunction. In the following sentence: "The choice is not respect. So, it's the reason I disagree. The first thing to do is ampliar (amplify) the access to food by.", this student used *So* to introduce the concluding sentence of her pre-test. This was an attempt to use what was within her linguistic system to meet the cognitive demands of the task. During the post-test, she did not use this conjunction. This may have happened because during the treatment procedure she was instructed on how to end sentences using *Therefore* and *Thus*. However, this student did not finish her train of thought. Her text was incomplete because she decided to handle it back at the same time as the other students. Thus, we can not directly point out that she learned how to properly use *Therefore* and *Thus*.

In the pre-test, student TGS3 made use of "so that way" to state a clause of result: "so that way they can produce more oxygen." In the post-test, she did not use *So* to introduce a

clause of result, she used a gerund instead: “GMOs are harmful to the environment as they can lower the level of biodiversity by removing some pests, resulting in the removal of food sources for other organisms.” This student did not follow the instruction to include a concluding sentence reaffirming her position. Thus, no conjunctive adverb that meets this function in a text, taught during the treatment procedure, was used in her post-test. This also happened with student TGS2. They performed very similarly. Student TGS2 did not finish their paragraph with a reaffirm/concluding sentence; although in the pre-test they used *In conclusion* to finish the paragraph. Given this fact, no use of *Therefore* or *Thus* was registered in their text. They both had enough time to finish their paragraphs, since all students handled back before time was over. Thus, we can interpret the choice of not using the conjunctions personally - they may have felt that what they wrote was sufficient to state their points of view.

I will now address the use of two subordinating conjunctions: *Though and Although,* respectively. They were only found in the text of the two most proficient students that took part in this experiment, based on my 7-week observations on their performance in the classroom. Student TGS1 used *though* at the end of her text to state a contrasting sentence. This conjunction is used in more informal speaking and writing. Student TGS2 made use of the correct version of the conjunction for formal writing: *although*. Even though this student used *although* correctly, he asked me during the experiment to spell it. He knew how to use it properly and was acquainted with the conjunction, but he was not sure how to spell it. Both cases can be interpreted the same way: they used what was within their interlanguage system to meet the communicative demands of the text. Analyzing this from the perspective of the Output Hypothesis, they tested hypotheses. Probably, student TGS1 uses *Though* when she is casually speaking English and decided to use it in her writing to meet the communicative demands. If she were acquainted with the difference between *Though* and *Although,* she might have used the latter. This shows how instruction plays a significant rule in accuracy. Her choice of using *Though* in writing to state her point of view shows that in order to produce a more accurate speech, it is necessary to go through instructional techniques to notice how particular language features are used and their appropriate context. In the post-test, which was considerably less extended, student TGS1 did not repeat the use of *though*. The choice to contrast two different ideas was met by the use of *Yet* and *But*. Thus, we can say that instruction had an effect on this student’s writing performance turning this into a more accurate speech; although there was a punctuation mistake in the use of *Yet*.

The effect of instruction on this student's writing was also traced on her use of *In addition*. In the pre-test, she (TGS1) used *Besides that* to introduce a new argument to her point of view. In the treatment procedure, she adopted *In addition* to add one more argument to her point of view: "In addition, GMOs will be resistant to insects and less powerful pesticides will be used." This conjunctive adverb was taught in the treatment procedure. Thus, the use of *In addition* can be interpreted as the effect of instruction on her text. Lastly, I would like to finish the analysis of the treatment group by pointing out the use of the expression *On the other hand*, used by student TGS4 in the pre-test. It is fair to point out that student TGS4 made an attempt to use this expression in order to meet the communicative demands. I call it an attempt because it was used incorrectly. Not due to punctuation rules or spelling, but the function it takes in a sentence. It is used to introduce the second of two contrasting points. This was not the case as can be seen: "The GMOs are beautiful, and make fell [feel] good in the first time by the appearance. But, what is see is some people sick without health assistance. On the other hand, we don't know which food is organic. The choice is not respect." As can be seen, the argument "we don't know which food is organic" does not contrast to what was said before. It adds one more point to why she thinks GMOs are harmful to human health. We can not affirm whether she learned this expression by Focus on Form or exposure to input. However, we can affirm that the effects of instruction could also be beneficial in bringing student's attention to their own input. If they are using particular language features correctly - expressing their message accurately and precisely.

After careful analysis and discussion of the data collected in the treatment group, we will now discuss the findings of the control group.

Table 2 - Control group
Student's choice of linking words before (pre-test) and after (post-test) exposure to input.

STUDENT	PRE-TEST	POST-TEST
CCS1	Because (6x) But (2x) So (2x) Adding to the fact (1x) And (8x)	Because (1x) So (1x) But (1x) The opposing point of view (1x) In conclusion (1x) And (9x)
CCS2	Because (4x) My supporting arguments from this point of view is (1x) And (5x)	Especially disagree with this (1x) Because (1x) Besides (1x) And (4x)
CCS3	I believe (1x) But (1x) And (2x)	I believe (1x) Because (1x) And (3x)
CCS4	Because (1x) However (1x) And (2x) The reason cause (1x) An opposing point (1x)	The claim opposing view (1x) So (1x) And (3x)

As can be seen in the table above, students in the control group had a similar choice to the treatment group in terms of the subordinating conjunctions chosen and used. *And*, *but* and *So* were traced in the control group's texts. However, not with the same frequency as the treatment group. *But* was used by 2/4 of the students. Based on the data collected and my interpretation, student CCS2 did not use it because this student, in the pre-test, typed three paragraphs instead of one. He started these paragraphs, respectively, introducing the opposing claim, his point of view and the reaffirming sentence of his point of view. When the opposing claim was introduced, there was no introductory phrase; this student started right away with the argument. In the last paragraph of the pre-test there was an attempt in using an introductory phrase: "My supporting arguments from this point of view are." As expected,

because this student did not go through explicit instruction, their post-test does not show any of the conjunctions found in the input he was exposed to (the paragraphs from scientific articles). It is fair to say that this student showed a very short variety of conjunctions in his text. In the post-test, *Besides* was used as a conjunction to introduce a new argument. It can be implied that this conjunction was already part of this student's interlanguage system because it was not found in any of the paragraphs in the input he was provided.

Student CCS4 did not use *but* or any subordinating conjunction to contrast different ideas; neither in the pre or post-test. What was seen was the attempt to contrast two different ideas using this introductory phrase: **"the claim opposing view about that is"**. Student CCS1 made a similar choice in his post-test. It might be interpreted as an attempt to use what was within their interlanguage system to convey a message. This proves the second function of output raised by Swain, "to try out means of expression and see if they work" (SWAIN, 1985, p. 249)." Student CCS1 also shows an example of this function: "adding to the fact of lower prices factor, they have a longer lifespan so the crops can be transported to longer places without getting rotten and provoke food poisoning." The introductory phrase "adding to the fact" shows an attempt to use what was within their interlanguage system to convey a message. It is also valid to point that this attempt was not entirely correct. It was not accurate. The appropriate way should be "adding to the fact **that** prices can be low". If only exposure to input was enough, this student could have used "moreover" or "in addition"; since these conjunctive adverbs were found in the treatment procedure. This would make his statement more accurate. However, as can be seen, it was not used. This same student used *In conclusion* in the post-test to introduce their concluding sentence. It can be interpreted that this is a conjunctive part of this student interlanguage system. No other conjunctive adverb such as *Therefore* or *Thus*, found in the input, was used.

Lastly, student CCS3 shows an attempt to introduce their point of view by the use of "I believe". This was repeated in the post-test; which shows that although he was exposed to conjunctions to introduce one's point of view after an opposing claim, he did not incorporate it in their output.

Overall, the data collected shows that there was no significant incorporation of input only by exposure to this target-input. It was a complex task, even more complex than the treatment group, due to the length of texts being processed and comprehension questions. All students attempted to use particular language features to meet the cognitive demands. The overall difference is that the treatment group organized and conveyed their message more

appropriately than the control group due to the effects of instruction on the immediate incorporation of input.

5. CONCLUSION

This study was set up to investigate the effects of instruction on students' immediate incorporation of input in a complex task. The data raised in this study shows that instruction had an effect on student's writing performance as they incorporated into their output the following target-forms: introductory phrases; conjunctive adverbs and the not so commonly used subordinating conjunctions *even though* and *although*. Data shows that all students in the treatment group incorporated at least two of the target-forms made salient in the treatment procedure. On the contrary, students in the control group, who were not exposed to any *Focus on Form*, did not show incorporation of input. The only similarity with the treatment group was the use of the basic-level subordinating conjunctions *and, but* and *because*. This tells us that in order to produce a more accurate speech, students need to be pushed by focus-on-form techniques to incorporate the target-form made salient in the input.

As discussed previously by Swain (1985, 1995) output plays a significant role in second language acquisition because it pushes students to modify their output. For intermediate students who feel like they do not progress, we stated that complex tasks (Robinson, 2001, 2003) lead to accuracy. For this accuracy to happen, they need to be engaged in *Focus-on-Form* techniques (DOUGHTY, 1991). The target-form of the study is the type that is necessary in order to convey one's point of view coherently, precisely and appropriately. Students were instructed to raise an opposing claim and contrast it with their point of view. Although two students in the treatment group showed acquaintance with some linking words found in the treatment procedure, they also incorporated some of the linking words into their output.

There were some constraints to this study that needed to be considered in order to enhance the quality of the findings in a possible replication of this study. Firstly, the number of participants. Even though several students were called to take part in this study and a higher number took part in the first session of the experiment, not all of them took part in the second and most important part of the experiment. Thus, if the number of participants were higher, it would be possible to present more consistent and quantitative findings to answer the question proposed. Secondly, although the experiment was conducted with students in an English conversation course, I would conduct an overall proficiency test with students prior to

the experiment and make correlations to the choice of conjunctions after the treatment procedure and if they used them correctly. It could not be considered in the data raised in this study, but after the experiment, I raised the question to students if they found it easier to write the second paragraph (post-test), and ¾ of the students in the treatment group said it was. The only exception was student TGS4, who said it was still hard and she thought it was due to her linguistic level.

Thirdly, I would replicate the study with a less scientific theme, but still keeping the complexity of the task high. It would be interesting to check if students would incorporate more input if the semantic processing was not so high. Lastly, it would be highly necessary to check long-term effects of the incorporation of input. Due to practical applications and the end of the 6-week course, it was not possible to test students in a task that demanded the same form-function mapping. Applying a different topic would be interesting to check the ability to transfer such input into other contexts that require the same level of cognitive and communicative demands.

I would also like to raise the contributions of the present study to the field of adult Second Language Acquisition. Due to practical applications, it is harder to conduct studies with people relying on their availability to take over a volunteering position in the study. Given this fact, this study, despite the constraints discussed previously, aims at raising what is important to consider when teaching intermediate students. To test the effects of instruction shows that relying on a comfortable level of exposure will not make students stretch their interlanguage system. Although a complex task brings their attention to accuracy, *Focus on Form* is necessary to help them map out the form-function relations when conveying their message precisely and appropriately.

Therefore, this paper aims to contribute with the existing literature in the area and provide a practical and descriptive analysis of considerations in methodological procedures for teaching written skills in a communicative classroom of adult students learning a second language.

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7. APPENDICES

7.1 Appendix 1 -

Vocabulary Session

NAME _____

BEFORE WATCHING

Vocabulary Session

You're going to watch a video about GMOs. Throughout this video you will see some new words that might not be familiar to you. Down below, there is a set of exercises to help you understand the meaning of these words to prepare you to watch the video. But first, take a look at the list of words and check the words you already know.

- ☐ crops
- ☐ to withstand
- ☐ drought
- ☐ hazards
- ☐ breeding
- ☐ yield
- ☐ offspring
- ☐ traits

Understanding that you know the meaning of the words you checked, write down a sentence/sentences including the word/words you checked.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

EXERCISE

The following statements are taken from the video you are going to watch. Circle the appropriate meaning to the words in bold.

I. “Although genetic modifications have occurred throughout history with selective **breeding**, scientific advances have allowed this practice to advance further in today’s times”.

a) the product or result of something
b) the mating and production of offspring by animals and/or plant.
c) a classifying phrase or name applied to a person or thing, especially one that is inaccurate or restrictive.

II. “**Crops** can be engineered to resist extreme weather.”

a) remain undamaged or unaffected by
b) the product or result of something
c) a cultivated plant that is grown as food, especially a grain, fruit, or vegetable.

III. Farmers have to culture plants that can **withstand** high salt content in soil and groundwater.

a) to resist or endure successfully
b) to grow something by labor and care
c)

IV. “Herbicides and Pesticides create certain **hazards** on croplands.”

a) chemical that harms the soil
b) dangerous or risks
c) an advantage or profit gained from something

V. “Because of the genetic resistance being in the plant itself, the farmer still achieves a predictable **yield** at the same time.”

a) smart, fitted, and well cut.
b) the full amount of an agricultural or industrial product.
c) the process or period of gathering in crops.

VI. Outcrossing can happen over large distances, where new genes can be included in the **offspring** of organic traditional plants or crops that are miles away.

a) the grain from a plant

b) a flowering plant's unit of reproduction, capable of developing into another such plant.
c) the product of the reproductive processes of a person, animal, or plant

VII. “Farmers have to culture plants that can withstand high salt content in soil and groundwater, not to mention long periods of **drought**.”

a) the condition of becoming filled or covered with a large amount of water
b) a long period when there is little or no rain
c) a sudden and violent shaking of the ground, sometimes causing great destruction, as a result of movements within the earth's crust or volcanic action.

VIII. “Genetic engineering happens when a new **trait** is inserted into the food which does not occur naturally in their species.”

a) a genetically determined characteristic
b) a substance used for destroying insects or other organisms harmful to cultivated plants or to animals
c) a substance that is toxic to plants, used to destroy unwanted vegetation.

7.2 Appendix 2

WATCHING

Now, you're going to watch a video about the pros and cons of GMOs. As you watch, fill in the gaps in the worksheet with the pros and cons about GMOs. In the section: "argument explained", you will explain the argument using your own words. Some of the gaps are already filled to help you keep up with the video. This exercise will prepare for the next step.

WATCHING INSTRUCTIONS

You will watch each "advantage" and "disadvantage" section twice.

During the **first time** you watch, focus on understanding. You don't need to write anything down. Try to understand the explanation behind the advantage presented in the video.

During the **second time**, you can start writing down key words that will help you explain the supporting argument presented.

After watching, you'll have up to two minutes to write down what you understood using your own words.

ADVANTAGES	**ARGUMENT EXPLAINED (pros)**
1. They are more appealing to eat	The color of foods can be genetically modified so they become more pleasing to eat.
2. Stronger crops	The crops can be engineered to withstand poor and severe weather conditions.
3. Easier to transport	GMOs can help to solve the food shortage crisis in some countries by its prolonged shelf life. They can be transported greater distances. Because of that, they help to reduce food waste.

4. Insect Resistance	Some GM plants can be genetically modified to repel insects. This helps to reduce the amount of pesticides used.
5. Improved nutritional content	GM foods can be genetically modified to gain denser nutritional content. For example, rice can be genetically modified to produce high levels of Vitamin A. This helps to reduce malnutrition.
6. Decrease in global warming	Because GMOs can be planted in non-suitable areas for farming, there are larger amounts of plants. This leads to higher levels of oxygen decreasing the proportion of carbon dioxide .
7. Medical Benefits	Through genetic engineering, the benefits of shots and medicines can be inserted into GM foods, so patients can benefit from it.

DISADVANTAGES	**ARGUMENT EXPLAINED (cons)**
1. Allergic reactions	
2. May produce superbugs	Some weeds may gain resistance to the GMO plants and become stronger.
3.Antibiotic resistance	There is concern that the genes inserted in the organism could transfer to the body and bacteria in the gut.
4.Outcrossing	where genes from GMO foods pass into wild plants and other crops
5. Low level of Biodiversity	
6. May affect animal protein	GMO components can be traced in eggs, meat, milk, seafood and animal muscle tissues.

7.3 Appendix 3
After Writing - Treatment Group

AFTER WRITING

Take a look at the argumentative paragraphs samples and answer the questions below each paragraph.

EX 1. The paragraph below is about the risks of GMOs.

It has been argued that from the available experimental data, currently utilized GM plants appear safe and show no effects on animals or animal products. It has also been stated that risks caused by the use of GM plants appear to be so low that they should be negligible in comparison with their potential benefits. However, long-term risks for most conventional foods have never been analyzed. GM crops are novel foods, and the assessment of their safety is essential to protect the environment, as well as the health of humans and livestock.

I. The writer talks about the safety of GM plants. Write down the exact sentences in which he/she points the **counter arguments/claims** to his/her point of view:

II. Write down the sentence that states the **writer's point of view**?

III. Write down the concluding sentence of this paragraph.

IV. What two **introductory phrases** were used to state the counter arguments? Highlight that in the text.

V. What connector was used to state the writer's point of view? Highlight that in the text.

EX. 2 The paragraph below talks about the effects of GMOs on the environment.

Many concerns have been raised for the environment: the capability of a GMO to escape from confinement and therefore potentially to transfer engineered genes into wild populations.

I. What introductory phrase was used to state the risks of GMOs to the environment?

EX. 3 - The paragraph below is about the differences between genetically modified crops and non-GM crops.

Although it is argued that small differences between GM and non-GM crops have little biological meaning, it is opined that most GM and non-GM crops fail to meet the definition of substantial equivalence.

The statement above has two main sentences (one before and after the comma). Think about the relationship between these sentences.

I. Do each of them express a complete thought alone?

II. Are they ideas that complement each other or contrast?

III. Highlight the connector that introduces the first contrasting sentence.

EX . 4 - the paragraph below is about the safety of GM crops.

Despite the extraordinary safety record of GM crops, GM agriculture as a whole faces the most restrictive regulatory framework outside the nuclear industry.

The statement above has two main sentences (one before and after the comma). Think about the relationship between the sentences.

I. Do each of them express a complete thought alone?

II. Are they ideas that complement each other or contrast?

III. Highlight the connector that introduces one of the contrasting sentences.

EX. 5 - the statement below is about the safety of GM crops in Europe.

The impressive safety record of Bt crops is unprecedented, yet Bt crops in Europe are subject to severe rules which even the EC has admitted make no sense.

The statement above has two main sentences (one before and after the comma). Think about the relationship between the clauses.

I. Do each of them express a complete thought alone?

II. Are they ideas that complement each other or contrast?

III. What connector is used to link the two contrasting ideas? Highlight.

EX. 6 - The paragraph below is about the research methods in the field of genetic engineering.

Preliminary Stage of Research: Most of the research in the field of genetic engineering is in its preliminary stages. The tests are generally conducted on animals and very little of the research is reviewed by scientists. Moreover, the research methodology used by these companies is not reviewed by the FDA (Food and Drug Administration).

I. Three main arguments are raised in the text above. What are they?

II. Which connector is used to introduce the third argument?

EX. 7 - the paragraph below is about weed's resistance to glyphosate.

This dataset shows that in the US, there are currently 17 weeds recognised as exhibiting resistance to glyphosate, of which two are not associated with glyphosate tolerant crops. In addition, it shows that some of the first glyphosate resistant weeds developed in Australia in the mid 1990s before the adoption of GM HT crops and currently there are 16 weeds exhibiting resistance to glyphosate in Australia, even though the area using GM HT (tolerant to glyphosate) crops in the country is relatively small (about 1 million ha in 2016).

I. Highlight the connector in the text that adds up a new argument to the text?

II. Which connector introduces a statement that seems opposing/surprising after what has just been said?

EX. 8 - the paragraph below is about the effects of biotechnology in agriculture on the environment.

It is widely accepted that increases in atmospheric levels of greenhouse gasses such as carbon dioxide, methane and nitrous oxide are detrimental to the global environment. Therefore, if the adoption of crop biotechnology contributes to a reduction in the level of greenhouse gas emissions from agriculture, this represents a positive development for the world.

I. The paragraph above presents the claim that crop biotechnology helps to reduce greenhouse gasses emission. Highlight which connector introduces this **concluding idea.**

II. Which connector introduces examples in the text? Highlight.

EX 9 - The paragraph below is about the positive effects of BT-protein crops on the environment.

Similarly, pest-resistant GM crops expressing Bt proteins are environmentally beneficial because there is no need to spray broad-spectrum pesticides onto the plants, thus reducing the use of fuel and avoiding environmental contamination with chemical pollutants.

I. The paragraph above presents the claim that BT-protein crops reduce the use of fuel and avoid environmental contamination. Highlight what connector introduces this **concluding idea.**

EXERCISE 2

I. The two sentences below introduce opposing points of view. Use expressions from the examples above to start these sentences.

a) _____ that live organisms have been through modifications due to environmental conditions. This is called evolution.

b) _____ naturally occurring viruses can recombine with viral fragments that are introduced to create transgenic plants, forming new viruses.

II. The gap in the paragraphs below connects two contrasting sentences. Fill in with the appropriate connector.

Experts are working on developing foods that have the ability to alleviate certain disorders and diseases. _____ researchers and the manufacturers make sure that there are various advantages of consuming these foods, a fair bit of the population is entirely against them.

_____ the potential benefits of the application of genetic engineering in agriculture in order to improve the quality and the reliability of the food supply, public and scientific concerns have been raised in many parts of the world about environmental and food safety of GM crops.

The gaps in the text below introduces the concluding period of a paragraph. This is the moment that the writer gathers the facts mentioned and reaffirms his/her view.

However, there are disadvantages, the major one being the amount of DNA, which could be amplified, is affected by food processing techniques and can vary up to 5-fold. _____, results need to be normalized by using plant-specific QC-PCR system.

PARAGRAPH GUIDELINE

CONNECTOR / INTRODUCTORY PHRASE	FUNCTION
	These introductory phrases are used to start writing a paragraph by stating an opposing claim to your point of view.
	This connector is used to state an opposing sentence to what has been said before. It is always used after a period and followed by a comma.
	These connectors are used to state two opposing independent sentences.
	These connectors are used to add a new argument to your point of view.
	These connectors are used to introduce a concluding thought. They are commonly used at the beginning of the last period of the paragraph.

7.4 Appendix 4
After Writing - Control group

AFTER WRITING

The following paragraphs you are about to read were taken from articles about GMOs. They present views from both sides: opposite and in favor of GMOs. Read them and answer the questions below each paragraph.

EX 1.

It has been argued that biotechnology as such is neither good nor bad, and it has the potential to alleviate or aggravate the impact of agriculture on the environment, to improve human and animal nutrition or to pose danger to human or animal health. Thus, the challenge is to develop, supply, and manage bio-technology for the benefit of humankind and the environment.

I. What is the main challenge of biotechnology when addressing GMOs?

EX 2. The paragraph below talks about the risks of GM plants.

It has also been stated that risks caused by the use of GM plants appear to be so low that they should be negligible in comparison with their potential benefits. However, long-term risks for most conventional foods have never been analyzed. GM crops are novel foods, and the assessment of their safety is essential to protect the environment, as well as the health of humans and livestock.

I. What is the point of view of the writer about these risks?

EX 3.

Many concerns have been raised for the environment: the capability of a GMO to escape from confinement and therefore potentially to transfer engineered genes into wild populations, the persistence of the gene after a GMO has been harvested, the instability of new genes, the

reduction of the spectrum of other plants resulting in a significant loss of biodiversity and an increase in the use of chemicals in agriculture.

I. What are the main points raised by the antagonists of GMOs about its effects on the environment?

EX 4. The paragraph presents the view of GMO supporters.

Supporters also consider GM crops indispensable in facing the severe global food and nutrition security problem in developing countries: although GM crops are not presented as the "absolute solution", it has been stated that they could undoubtedly make a significant contribution to an array of measurements and incentives to this constantly growing problem.

I. What is the main point raised by the supporters of GMOs?

EX 5. Read the following paragraph about the risks of GMOs.

Despite the extraordinary safety record of GM crops, GM agriculture as a whole faces the most restrictive regulatory framework outside the nuclear industry. This dogmatic requirement for "zero risk" is astonishing when one considers that all other technologies and activities in the human sphere of existence, including nuclear energy, are considered as part of a risk/benefit trade-off. For example, all known drugs have adverse effects but are accepted because they have a beneficial role in treating disease, many (natural) foods have well-known adverse health effects yet people consume them anyway, and other allergenic plant-derived products are accepted without question

I. What is the point raised by the writer of this paragraph about restrictive measures placed upon GMOs?

II. What is the comparison that he/she is making?

III. Do you agree or disagree with his/her point of view?

EX 6. The following paragraph is about conventional methods x biotechnology modification**.**

For thousands of years, humans have used breeding methods to modify organisms. Corn, cattle, and even dogs have been selectively bred over generations to have certain desired traits. Within the last few decades, however, modern advances in biotechnology have allowed scientists to directly modify the DNA of microorganisms, crops, and animals.

Conventional methods of modifying plants and animals—selective breeding and crossbreeding—can take a long time. Moreover, selective breeding and crossbreeding often produce mixed results, with unwanted traits appearing alongside desired characteristics. The specific targeted modification of DNA using biotechnology has allowed scientists to avoid this problem and improve the genetic makeup of an organism without unwanted characteristics tagging along.

I.The writer mentions two conventional methods of modifying organisms. What are they?

II. What is the problem with these two conventional methods?

EX 7. The paragraph below is about weed's resistance to glyphosate.

This dataset shows that in the US, there are currently 17 weeds recognised as exhibiting resistance to glyphosate, of which two are not associated with glyphosate tolerant crops. In addition, it shows that some of the first glyphosate resistant weeds developed in Australia in the mid 1990s before the adoption of GM HT crops and currently there are 16 weeds exhibiting resistance to glyphosate in Australia, even though the area using GM HT (tolerant to glyphosate) crops in the country is relatively small (about 1 million ha in 2016).

I. In the US, how many weeds developed resistance to glyphosate?

II. Currently, how many weeds exhibit resistance to glyphosate in Australia?

EX. 8 The paragraph below is about the risks of allergenicity.

The risk of allergenicity could be tackled by assessing the stability of the novel protein(s) to the processing of food and to digestive processes, since
many allergenic proteins are resistant to degradation. It is also advisable to avoid using plants containing known allergens, such as peanuts and Brazil nuts, as sources of genes for GM plants.

I. According to the writer of the text, how could scientists manage the risks of allergenicity caused by GM plants?

EX 9.

It is widely accepted that increases in atmospheric levels of greenhouse gasses such as carbon dioxide, methane and nitrous oxide are detrimental to the global environment. Therefore, if the adoption of crop biotechnology contributes to a reduction in the level of greenhouse gas emissions from agriculture, this represents a positive development for the world.

I. Does the writer of the paragraph above have a supporting or disapproving view on the effects of GMOs to the environment?

EX 10. The following paragraph is about one of the benefits of GM crops: pest resistance.

Pest-resistant GM crops expressing Bt proteins are environmentally beneficial because there is no need to spray broad-spectrum pesticides onto the plants, thus reducing the use of fuel and avoiding environmental contamination with chemical pollutants.

I. What are the benefits of pest-resistant GM crops to the environment?

7.5 Appendix 5
Pre-test

NAME _____

WHERE DO YOU STAND?

In the video, you were presented with the pros and cons of GMOs. Taking the pros and cons into account, you are now going to write an argumentative paragraph stating your agreement or disagreement with the following statement:

GMOs are harmful to human health.

KEEP IN MIND: an argumentative paragraph needs to present an opposing claim to your point of view. Your point of view needs to be supported by an argument (quotation, scientific fact, example). You also need to end the paragraph by reaffirming your position.

Brainstorming:

Opposing claim to my point of view	
My point of view about the statement	
Supporting arguments to my point of view	

You are allowed to use the pros-and-cons worksheet to review the arguments raised in the video. You have 15 minutes to finish this task.

7.6 Appendix 6
Post-test

WHERE DO YOU STAND?

Taking the pros and cons into account, you are now going to write an argumentative paragraph stating your agreement or disagreement with the following statement:

GMOs are harmful to the environment.

KEEP IN MIND: an argumentative paragraph needs to present an opposing claim to your point of view. Your point of view needs to be supported by an argument (quotation, scientific fact, example). You also need to end the paragraph by reaffirming your position.

You are allowed to use the pros-and-cons worksheet to review the arguments raised in the video. You have 15 minutes to finish this task.

7.7 Appendix 7
STUDENT TGS1

TREATMENT GROUP - TESTS

PRE-TEST

Genetically modified organisms (GMOs) bring us a discussion with positive and negative effects, but I'll explain why I believe that GMOs are beneficial than harmful to human health.

First of all, I understand that new technologies and engineering advances can cause new problems, but the improvement seen through the years in the area gives me hope and security that every or mostly negative sides will have a solution.

To support my argument, I'll start by saying that humans have been selecting and modifying crops, and GMO makes crops more resistant. it is smarter to do that, because not every soil will be prepared or ideal for plantations or even the harsh weather can't be controlled and could affect entires yields generating great economy loss. Besides that, it's resistance to insects, easier transportation improved nutritional content are a few more examples of the benefit of GMOs, and the turnout is better for humans and our living conditions and system. we need more nutrients, globalization has broadened our borders and we must transport food through great distances, and GMO helps not to waste that much food in this process. Risks will always exist, but humanity is better and improved by GMO advances than without it. I can be harmful in some ways though.

POST-TEST

It has been argued that GMOs can produce superbugs and create other harmful consequences to the environment. Yet, there is not enough data or research regarding that in the long term.

Despite that, GMOs can also help to decrease global warming by decreasing gas emission through more plants planted (it means more oxygen produced). In addition, GMOS will be more resistant to insects and less powerful pesticides will be used. more quimical products can affect the soil and consequently the environment. Therefore, many things produced by humans are harmful to the environment, and GMO can be as well, but also great benefits come with GMO advanced technology.

ORIGINAL STUDENT'S WORK

PRE-TEST

Genetically Modified Organisms (GMOs) bring us a discussion with positive and negative effects, but I'll explain why I believe that GMOs are more benefitial than harmful to human health.

First of all, I understand that new tecnologies and engenieering advances can cause new problems, but the improvement seen through the years in the area gives me hope and security that every (or mostly) negative sides will have a solution.

To support my argument, I'll start by saying that humans have been selecting and ~~modifying~~ modifying crops, and GMO makes crops more resistent. It is smarter to do that, because not every soil will be prepared or ideal for plantations or even the harsh weather can't be controlled and could affect entires yields - generating great economic loss. Besides that, it's resistance to insects, easier transportation, improved nutritional content are a few more exemples of the benefit of GMOs, and the turnout is better for humans and our living condition and system. We need more nutrients, globalization has broadened our boarders and we must transport food through great distances, and GMO helps not to waste that much food in this process. Risks will always exist, but humanity is better and improved by GMO advances than without it. It can be harmful in some ways though.

WHERE DO YOU STAND?

Taking the pros and cons into account, you are now going to write an argumentative paragraph stating your agreement or disagreement with the following statement:

GMOs are harmful to the environment.

KEEP IN MIND: an argumentative paragraph needs to present an opposing claim to your point of view. Your point of view needs to be supported by an argument (quotation, scientific fact, example). You also need to end the paragraph by reaffirming your position.

You are allowed to use the pros-and-cons worksheet to review the arguments raised in the video. You have 15 minutes to finish this task.

It has been argued that GMOs can produce superbugs and create other harmful consequences to the environment. Yet, there's not enough data or research regarding that in the long term.

Despite that, GMOs can also help to decrease global warming by decreasing gas emissions through more plants planted (it means more oxygen produced). In addition, GMOs will be more resistant to insects and less powerful pesticides will be used. More quimical products can affect the soil and consequently the environment. Therefore, many things produced by humans are harmful to the environment, and GMO can be as well, but also great benefits come with GMO advanced → Technology

7.8 APPENDIX 8

STUDENT TGS2

PRE-TEST

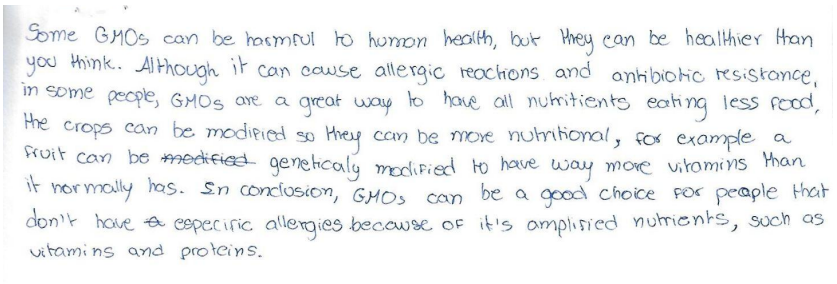
Some GMOs can be harmful to human health, but they can be healthier than you think. Although it can cause allergic reactions and antibiotic resistance, in some people, GMOs are a great way to have all nutrients eating less food, the crops can be modified so they can be more nutritional, for example a fruit can be geneticaly modified to have way more vitamins than it normally has. In conclusion, GMOs can be a good choice for people that don't have a especific allergies because of its amplified nutrients, such as vitamins and proteins.

POST-TEST

It has been stated that GMOs can affect the environment, by affecting the level of biodiversity or by the outcrossing, because there is a risk of mixing GMOs and non-GMOs. However, the GMOs are helping to decrease the global warming, because they decrease the level of greenhouse gas emissions, and they can grow in places plants couldn't before, changing the quantity of oxigen in the atmosphere.

ORIGINAL STUDENT'S WORK

PRE-TEST


Some GMOs can be harmful to human health, but they can be healthier than you think. Although it can cause allergic reactions and antibiotic resistance, in some people, GMOs are a great way to have all nutritients eating less food, the crops can be modified so they can be more nutritional, for example a fruit can be ~~modified~~ geneticaly modified to have way more vitamins than it normally has. In conclusion, GMOs can be a good choice for people that don't have ~~a~~ especific allergies because of it's amplified nutrients, such as vitamins and proteins.

POST-TEST

WHERE DO YOU STAND?

Taking the pros and cons into account, you are now going to write an argumentative paragraph stating your agreement or disagreement with the following statement:

GMOs are harmful to the environment.

KEEP IN MIND: an argumentative paragraph needs to present an opposing claim to your point of view. Your point of view needs to be supported by an argument (quotation, scientific fact, example). You also need to end the paragraph by reaffirming your position.

You are allowed to use the pros-and-cons worksheet to review the arguments raised in the video. You have 15 minutes to finish this task.

It has been stated that GMOs can affect the environment, by affecting the level of biodiversity or by the outcrossing, because there's a risk of mixing GMOs and non-GMOs. However, the GMOs are helping to decrease the global warming, because they decrease the level of greenhouse gas emissions, and they can grow in places plants couldn't before, changing the quantity of oxigen in the atmosphere.

7.9 APPENDIX 9
STUDENT TGS3

PRE-TEST

Some may say that GMOs decrease global warming by helping with the reduce of greenhouse emissions, because they can be grown on a wider variety of soils so that way they can produce more oxygen, but I do agree with these statements because to me GMOs are harmful to human health.

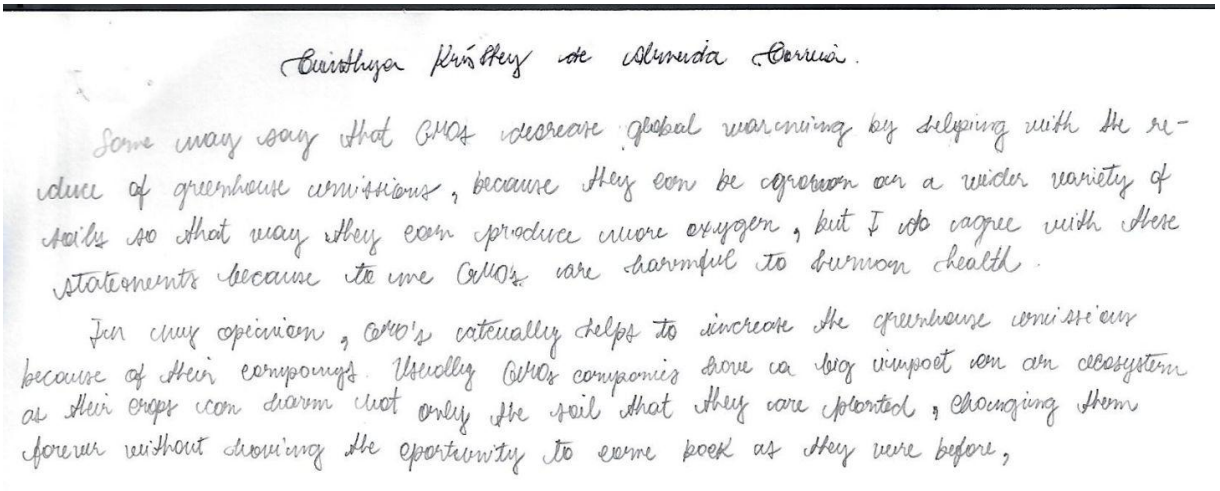
In my opinion, GMO"s actually helps to increase the greenhouse emissions because of their companies. Usually GMOs companies have a big impact on an ecosystem as their crops can harm not only the soil that they are planted, changing them forever without having the opportunity to come back as they were before.

POST-TEST

It has been stated that as GMOs are genetically enhanced with vitamins and have a higher nutritional content in comparison to non-GMO plants. However, GMOs are harmful to the environment, as they can lower the level of biodiversity by removing some pest, resulting in the removal of food sources for other organisms.

STUDENT'S ORIGINAL WORK

PRE-TEST


Cristhyan Kristhey de Almeida Correia.

Some may say that GMOs decrease global warming by helping with the reduce of greenhouse emissions, because they can be grown on a wider variety of soils so that way they can produce more oxygen, but I do agree with these statements because to me GMOs are harmful to human health.

In my opinion, GMO's actually helps to increase the greenhouse emissions because of their companys. Usually GMOs companies have a big impact on an ecosystem as their crops can harm not only the soil that they are planted, changing them forever without having the oportunity to come back as they were before,

POST-TEST

WHERE DO YOU STAND?

Taking the pros and cons into account, you are now going to write an argumentative paragraph stating your agreement or disagreement with the following statement:

GMOs are harmful to the environment.

KEEP IN MIND: an argumentative paragraph needs to present an opposing claim to your point of view. Your point of view needs to be supported by an argument (quotation, scientific fact, example). You also need to end the paragraph by reaffirming your position.

You are allowed to use the pros-and-cons worksheet to review the arguments raised in the video. You have 15 minutes to finish this task.

It has been stated that as GMOs are genetically enhanced with vitamins and have a higher nutritional content in comparison to non-GMO plants. However, GMOs are harmful to the environment, as they can lower the level of biodiversity by removing some pests, resulting in the removal of food sources for other organisms.

8.0 APPENDIX 8
STUDENT TGS4

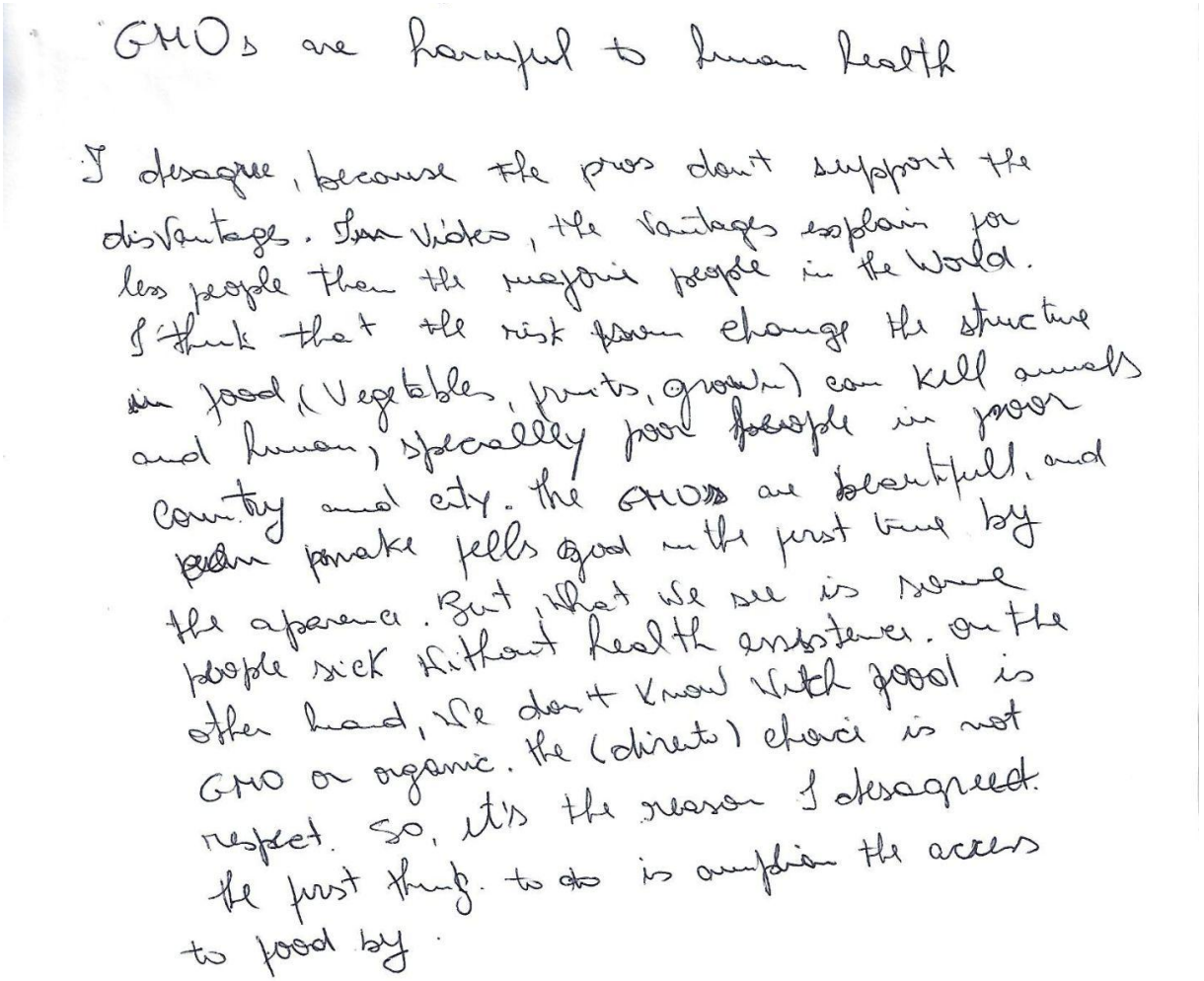
PRE-TEST

I disagree, because the pros don't support the disvantages. In video, the vantages explain for less people than the majorite people in the world. I think that the risk for change the structure in food (vegetables, fruits, grains) can kill animals and humans, specially poor people in poor country and city. The GMOs are beautiful, and make fell (feel) good in the first time by the appearance. But, what is see is some people sick without health assistance. On the other hand, we don't know which food is GMO or organic. The (direito) choice is not respect. So, it's the reason I disagree. The first thing to do is ampliar the access to food by. (didn't finish)

POST-TEST

I agree that GMOs are harmful to the environment, some researchs (researchers) can help people and, in future, some studies will be safe. Despite, the risks for health today some researchers can make knowledge who will use (be used) to be life better. However, we need make questions about why the nuclear industry, why the food industry _____ fabricate some research and don't fabricate research that can help poor people now, yet. (didn't finish)

STUDENT'S ORIGINAL WORK



GMOs are harmful to human health

I desagree, because the pros don't support the disVantages. In Video, the Vantages explain for less people than the majoris people in the World. I think that the risk from change the structure in food (Vegetables, fruits, grown) can kill animals and human, specially poor people in poor country and city. the GMOs are beautifull, and can make fells good in the first time by the aparence. But, what we see is some people sick without health assistence. on the other hand, we don't know with food is GMO or organic. the (diretc) choice is not respect. so, it's the reason I desagreed. the first thing to do is amplian the access to food by.

POST-TEST

I agree that GMOs are harmful to the environment; Some reserchs can helps people and, in future, they can be some studies will be safe. Despite, the risks for Health today some Researches can makes knowledge who will use to be life better. However, some studies we needs awake questions about the nuclear industry, why the food industry have financiate some research and don't financiate research that can helps poor people now, yet.

8.1 APPENDIX 8.1
STUDENT CCS1

CONTROL GROUP

PRE-TEST

The GMO's have more advantages for human health because they can be modified to be more nutritive, in terms of quantity and quality, because the GMO have denser nutritional value, so they can feed more people with good quality food with same or lower price of production and decrease malnutrition in the poorest regions, adding to the fact of lower prices factor, they have a longer lifespan so the crops can be transported to longer places without getting rotten and provoke food poisoning

And because of the resistence to bugs they are more independent from the pesticides, and this lower the risk of poisoning

But because of this advantages the GMO can provoke allergic reactions because of the interventions in her genetic code and some people can become sensitive after eating an modified fruit

The alterations in the fruits can contribute to an apolitical scenario of a widespread bacteria pandemic because this microorganisms are becoming more resistant to antibiotics, and the antibiotics are used in GMO to gain more resistance but they can be eaten and affect the human bacterial life

POST-TEST

The GMO can be harmful to the environment because they have low biodiversity and if the GMO zones are not sealed they can mix with natural organisms and affect them, and the modified genes can affect other living organisms when eaten, they can affect the resistance to antibiotics and potentially provoke an bacteria-resistant infection on people and animals

The opposing point of view are that problems and potential problems can be regulated and their worst effects reduced and the GMO can be used to reduce CO^2 and other greenhouse gases so they can reduce the global warming

In conclusion, the GMO can be good for some things like the reducing the global warming but they can create problems with the not-modified living things if they are not regulated and observed, the antibiotic intervention can be avoided to reduce potential creation of a resistant problematic bacteria

8.2 APPENDIX 8.2
STUDENT CCS2

PRE-TEST

Gmos have a lot benefits to the world and society cause and the benefits are a lot nutrition i can get from a medicine like vitamine or something else i can get from a fruit and it will help me get well very soon cuz that medicine should take long time to actually get better.

Gmo are harmful to human health cause the odds get more sick from it is high than get from something cause else and can happen than all antibiotics should get help it get better it wont help.

My supporting arguments from this point of view is there´s more sickness happen in real life and more antibiotic that could really helping are not because more resistant to this sickness.

POST-TEST

Gmos are harmful to the environment , and especially disagree with this, cause can be bring more resistance to the plants like corn and be resistance to insects it will be more help with take food to the globe with zero levels of attack from the crops and besides, there's a lot of good nutrition that can get from fruits, vegetables modifications it will be bring more vitamins to the body and helping with a lot disease around the world.

8.3 APPENDIX 8.3
STUDENT CCS3

PRE-TEST

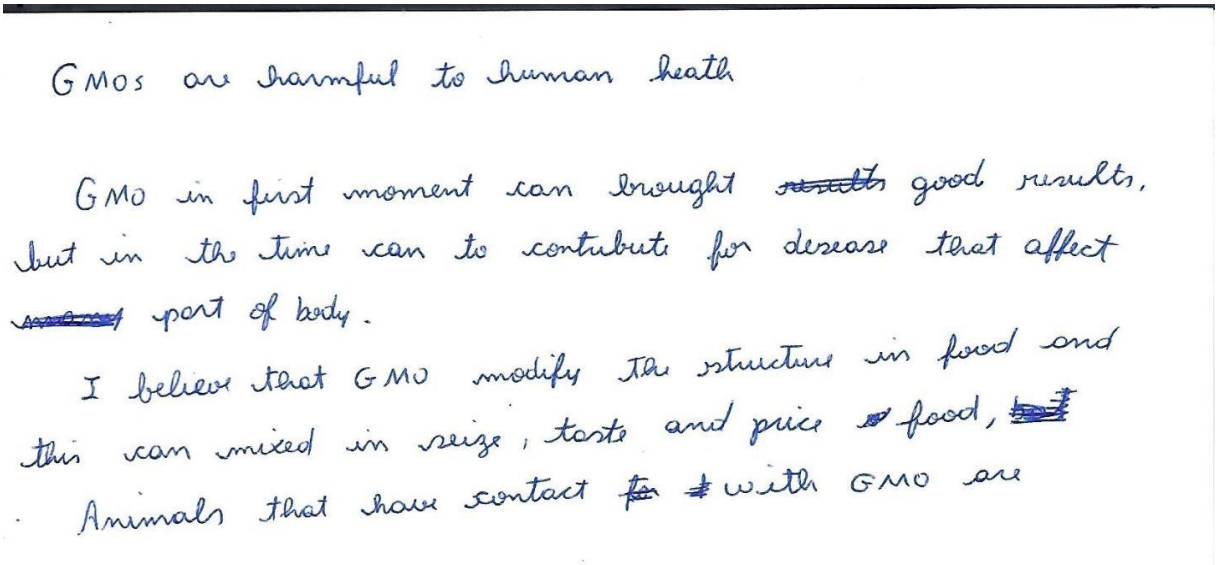
GMO in first moment can brought good results, but in the time can to contribute for desease (disease) that affect part of body. I believe GMO modify the structure in food and this can mixed in size, taste and price (of) food, Animals that have contact with GMO are. (did not finish).

POST-TEST

I believe that GMO in a long time caused many problems. In organism human being, I know that are news and brought many benefits in short time like price more attractive and foods are beautiful and seems healthy.
I hope GMOs in the future can brought benefits for population, because technology each days are faster. I am not against GMO, but also not favor.

STUDENT'S ORIGINAL WORK

PRE-TEST


GMOs are harmful to human heath

GMO in first moment can brought ~~results~~ good results, but in the time can to contribute for desease that affect ~~a~~ part of body.

I believe that GMO modify the structure in food and this can mixed in size, taste and price of food, ~~but~~

Animals that have contact ~~for~~ with GMO are

POST-TEST

Joalyson Amorim.

I believe that GMO in a long time caused many problems. in organism human being. I know that are news and brought many benefits in short time like price more atractive ~~and vary~~ and foods are beateful and ~~for~~ ~~season~~ seems healthy.

I Hope GMO in the future can brougth benefits for population, because thecnology each days are ~~more~~ faster. I'm not against GMO, but also not favor.

8.4 APPENDIX 8.4
STUDENT CCS4

PRE-TEST

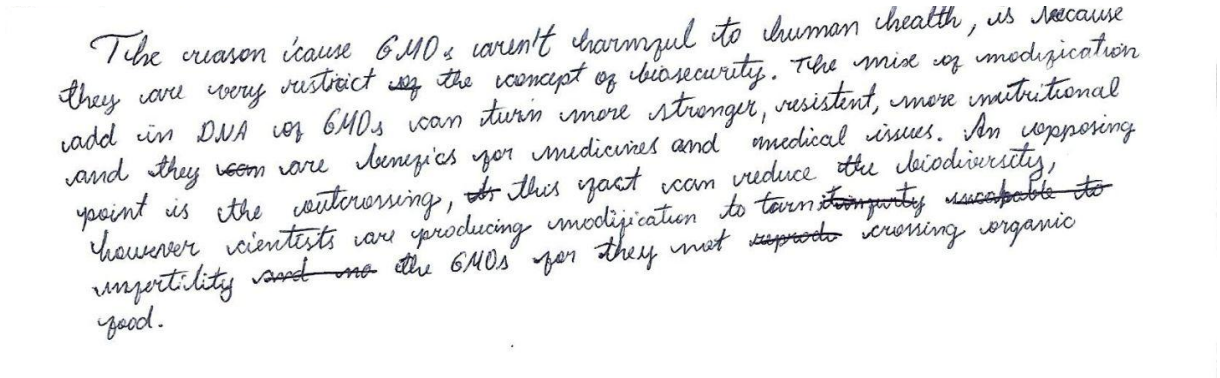
The reason cause GMOs aren't harmful to human health, is because they are very restrict of the concept of biosecurity. The mix of modification add in DNA of GMOs can turn more stranger, resistant, more nutritional, and they are benefics for medicines and medical issues. An opposing point is the outcrossing, this fact can reduce the biodiversity, however scientists are producing modification to turn infertility the GMOs for they not crossing organic food.

POST-TEST

GMOs are not harmful to the environment, the issue is the form and activity GMOs and organic food are planted. Larger crops, a lot of yards with one specie of plant prouse more issues for the environment than GMOs or organic food. A solution is more species of plants at the same place, so they can prove for other protection, resistance. The claim opposing view about that is the handful and the expensive value to maintain this plantation.

STUDENT'S ORIGINAL WORK

PRE-TEST



POST-TEST

Lourenço E. B. de Lima

GMOs are not harmful to environment, the issue is the form and activity GMOs and organics food are planted. Larges crops, a lot of yards with one ~~ss~~ specie of plant produce more issues for the environment than GMOs or organics food. ~~As~~ A solution is more species of plants at the same place, so they can prove for ~~each~~ other protection, resistence. The chain opposing view about that is the handful and the expensive value to maintain this plantation.