

# **‘Righting’ the wrong: Text revision in ESL students’ composing processes in senior high schools in Greater Accra, Ghana**

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## **Abstract**

Revision is a fundamental strategy in second language learners’ text composition primarily because it guarantees congruence between these learners’ translated texts and their writing intentions as they effortfully compose in a nonnative language. As such, as part of a larger study, the current research explores the revision behaviours of learners in English composition in senior high schools in Greater Accra, Ghana. Twenty-four students were purposively sampled to write a timed argumentative essay under think-aloud conditions. The data were analysed using Conijn et al.’s (2021) tagset of revision as an analytical framework. The findings show unique and general characteristics of the trigger, spatial location, sequence, orientation, evaluation, action and linguistic domains of the students’ revision behaviours. Also, the findings reveal significant weaknesses in the revision behaviours of the participants and offer insights into aspects of their overall composing competence. From the findings, English language teachers in Ghana are encouraged to adopt revision-strategy instruction and also develop the cognitive and metacognitive skills of their students.

**Keywords:** self-repair, self-regulation, cognitive strategies, argumentative essay writing, ESL writing, English in Ghana

## Introduction

Writing, from a cognitive standpoint, is conceptualised as entailing a combination of three recursive supra-strategies of composing: planning, translation or text-generation and revision or reviewing (Barkaoui, 2016; Flower & Hayes, 1980; Flower & Hayes, 1981). In planning, writers make an abstract representation of the essays to be written; in translation, they convert their plans into essays and in revision, they modify the nature and quality of these essays (Barkaoui, 2016; Kessler et al., 2012). By combining these supra-strategies during text composition, writers are able to produce texts in response to specific rhetorical demands within the task environment (Fein, 2022; Hayes & Berninger, 2014).

Of these supra-strategies, revision is crucial for text composition among native and non-native learners at all levels (Allal et al., 2004; Barkaoui, 2016). This is because particularly under timed-writing conditions, revision offers learners an opportunity to scrutinize the content, organization and language of the final essay to ensure consonance between these features and the quantity and quality of students' writing-related long-term and working-memory resources (Galbraith et. al., 2009; He & Shi, 2012). Revision therefore bridges the gap between students' writing competence and their performance (Ellis, 2019). More so, it has been found that more-skilled writers revise substantially, which aids their production of superior quality texts than less-skilled ones (see Kellogg, 1996; Leki et al., 2008). To this end, it has been observed that the higher writers' expertise and proficiency, the more efficient their use of revision strategies (see: Barkaoui, 2016; Revesz et al., 2019).

It must be noted that although revision is important in all students' composing processes, it is more crucial for non-native learners. This is because it has been revealed that because non-native writers have limited language proficiency in the areas of vocabulary and grammar, during text composition, they dedicate aspects of their already limited working-memory capacity solely

to the management of language which in turn affects their ability to deploy the necessary genre, topic and audience knowledge for the writing of quality texts (e.g., Lu, 2010). Revision to non-native learners' writing is therefore indispensable because the more effectively and efficiently these learners make use of the strategy, the better the essays that may result from the writing enterprise.

The central role of revision in non-native learners' writing has engendered significant research in English as a foreign language (EFL) and English as a second language (ESL) classrooms, particularly in university academic writing contexts and in language institutes, either as part of overall composing strategies or as a standalone approach. For instance, studies by Zamel (1983), Raimes (1987), Sasaki (2002), Khuder and Harwood (2015) and Revesz et al. (2019) have revealed the unique ways in which revision is employed by EFL and ESL university writers as part of the composing process. They have shown that unskilled university writers dedicate less time and attention to revision and to local issues such as syntactic and lexical errors during the practice, while their skilled counterparts spend more time on revision and on global issues such as appropriacy of language use. Furthermore, these studies have revealed that the higher writers' skills and expertise, the less engaged they are in pre-contextual revision (i.e.. revision at the leading edge of texts).

Notwithstanding the important contributions the foregoing studies and others have made to knowledge on the manifestation of revision in non-native writers' composing, a number of important gaps remain. Firstly, as argued by Conijn et al. (2021), there is a knowledge gap resulting from the limited perspectives from which revision has been conceptualised. They observe that previous works on revision have looked at just a few features of either process- or product-oriented revision properties. They therefore provide one of the most comprehensive tagsets with which revision behaviours may be examined in

online writing settings. However, the extent to which the tagset accounts for writing under pen-and-paper settings, Conijn et al. (2021) admit, is not widely known. There is also a population gap because in spite of the ever-growing body of knowledge on non-native students' writing generally (e.g., Aripin & Rahmat, 2021; Palpanadan et. al., 2014) and in Ghana specifically (e.g., Akamprige, 2017; Mensah, 2014; Owu-Ewie & Williams, 2017) works that examine ESL high school students' deployment of revision in handwriting conditions particularly in Africa are rare.

There is therefore the need to investigate the revision behaviours of ESL writers from a more comprehensive perspective of the construct looking at how process- and product-based properties manifest. To this end, the current study explores the revision strategies employed by students in English language classrooms in senior high schools in Greater Accra. It identifies and describes the unique ways in which process- and product-oriented revision behaviours form integral parts of the composing processes of these non-native writers and what the nature of the manifestations of these behaviours reveal about these students' overall revision competence.

## **Literature Review**

### **Text revision as a composing process**

Revision in text composition is seen as a process of evaluating and/or making changes in, adding to or deleting segments of varying text lengths (Roca de Larios et al., 2008; Kessler et al., 2012). It is a way by which writers alter various aspects of their texts to conform to the ideal content, organisation and language they want to produce at the end of a writing task. It is generally equivalent to text transformation.

One of the earliest descriptions of revision was provided by Flower and Hayes (1980) in which they explain that the strategy involves reading aspects of texts-written-so-far and editing them. In this regard, revision was limited to actual

transformations in the visible texts produced. This idea has undergone varied modifications in the literature (see: Flower et al., 1986; Lindgren & Sullivan, 2006) to capture revisions that occur prior to the generation of texts as well as processes such as detecting and diagnosing specific writing problems in the written product and selecting a modification strategy. Overall, writers who revise are those who ‘right’ texts that wrongly align with their writing plans.

### **External revision in composing**

As hinted in the preceding paragraph, the act of revising may manifest externally. External revisions may be conceptualised as revisions that are effected on the composing product. In these external revisions, writers make visible changes to the concept and form of the text-produced-so-far, changes that may appear in the forms of corrections in spelling, grammar and punctuation (Lindgren & Sullivan, 2006). This is why it is only external revisions that can be directly seen in the written product such as the final essay written (Conijn et al., 2021). The use of keystroke logging and eye tracking software in recent studies of revision in online settings (e.g., Revesz et al., 2019) provides detailed accounts of the ways in which writers successfully or unsuccessfully engage in external revision. Specifically, these studies reveal that writers modify linguistic and discursal features of their texts either at the text’s leading edge or away from it. In pen-and-paper settings, like those that obtain in the senior high schools in Ghana, external revisions should be expected to be more visible and observable in features such as cancellations, rewritings and insertions.

### **Process-based properties of external revision**

External revisions have been described by looking at their process-based properties. These properties offer insights into the procedures involved in ‘righting’ the wrong. In examining process-based properties of external revision, characteristics

such as spatial location, triggers, temporal location and sequencing are considered.

Spatial location may be seen as the physical setting of the revision in the composing product (i.e., the essay). The spatial location of external revision may be pre-contextual or contextual (Lindgren, 2005; Revesz et al., 2019; Conijn et al., 2021). Pre-contextual revision occurs at the leading edge of the text-produced-so-far and involves modifications to concepts such as ideas, plans or forms like grammar and vocabulary. On the contrary, contextual revisions occur in a text that has been previously written and involves all issues in pre-contextual revision (e.g., concept and form) including style and audience orientation (Lindgren, 2005). In effect, the difference between pre-contextual and contextual revision lies in where they occur.

Writers have been found to employ pre-contextual and contextual revisions differently in text composition. Barkaoui (2016) for instance found that low-proficient writers revised more pre-contextual issues and less contextual issues than their high-proficient counterparts. He explains that the difference in spatial location may be due to the ability of more proficient writers to produce texts that have fewer linguistic infelicities. Some other factors that may influence (the spatial location of) revision are writing expertise, proficiency in the second language, the type of task the writers are engaged in, the time constraints and the mode of writing (Barkaoui, 2016).

The external revisions done by writers may be triggered by errors, and reading and evaluation (Tillema et al., 2011; Wobbrock & Myers, 2006). Error-triggered revisions are usually not purposive while reading and evaluation revisions are purposive in nature. There are also temporal locations of revision which show the moment in time that the revision was done. These are looked at in terms of the beginning, middle and end of texts.

Furthermore, there are revision sequences examined in terms of the relationship between current revisions and previous

ones. Conijn et al. (2021) describe four revision sequences: repetitive, embedded, sequence forward and sequence backwards. In repetitive revisions, the writer makes a change at one point in the course of transcription and effects the same change in similar points in the text. In embedded revision, there is another change within the main revision the writer effects. In sequence forward, revision is made in front of the most recent one while sequence backward revision is made behind the most recent revision.

### **Product-based properties of external revision**

Other properties looked at in the literature are referred to as product-based properties. These properties of revision include orientation, evaluation, action and linguistic domain.

Orientation borders on depth of the changes writers make during text composition (Faigley & Witte, 1981). These changes may be formal such as those effected in spelling, punctuation and essay format, meaning preservation changes such as paraphrasing, micro revisions that border on such issues as emphasis and coherence, etc., and macro revisions which focus on the overall topic or subtopic being written on.

Evaluation may be considered as the overall impact of the revision on the revised text. The evaluation of writers' revision may be considered correct or incorrect and right or wrong (Conijn et al., 2021). Indeed, writers' attempt at revision may result in successfully rectifying an anomaly or unsuccessfully creating one.

Action refers to the actual steps involved in 'righting' the wrong during writing. Generally, writers are perceived to delete, insert, substitute and reorder texts during composition. In deletion, writers take out parts of texts already produced; in insertion, they add to the text, in substitution they delete and insert and in reordering, they change the positions of linguistic units in the text. Myhill and Jones (2007) found that writers adopt multiple revision activities during writing and are concerned with

matters that go beyond simple issues of accuracy. Specifically, they found that apart from revising for accuracy, the participants revised in order to add information to the text, to avoid repetition, and to ensure an overall improvement in the text.

At the linguistic domain of product-based properties, levels such as sub-word, word, phrase, clause, sentence and paragraph are looked at. In this regard Revesz et al. (2019) explored the linguistic domains of revision by United Kingdom university-level Chinese learners of English under electronic essay writing and stimulated recall conditions. The study was based on Kellogg's (1996) model of working memory in writing. The findings showed that formulation was aided by lexical retrieval, syntactic encoding and cohesion-based revisions. The findings also showed that the participants engaged more in language-related revisions than content-related ones. In spite of the significance of these findings, their weaknesses lie in how limited stimulated recalls are in revealing the actual steps taken during composing and the inability of the study to provide evidence on how pre-textual revisions are done. In an attempt to reduce such limitations, the current study employs think-aloud procedures of data collection since they are believed to provide a more accurate account of composing strategies.

More so, an earlier study by Polio et al. (1998) showed that there were significant improvements in the linguistic accuracy of the students' texts after revision. The students also exhibited revision behaviours that ranged from editing strictly at the sentence level to reframing of the entire essay. These show that when instructed to and given opportunities for correction, second language writers will be able to improve upon the linguistic accuracy of their writing. However, it must be noted that, students' ability to revise the linguistic deficiencies in their writings is largely hinged on the level of their competence in terms of their underlying proficiency about the correct use of those forms and not solely on the opportunities provided to them for revision. Also, under timed-essay writing conditions,



students who have adequate process knowledge will be able to apportion adequate time for revision.

### **Internal revision in composing**

Revisions may also occur internally. In internal revisions, writers conceptually review their pre-task plans or ideas and make changes to the concepts prior to transcription (Lindgren & Sullivan, 2006; Stevenson et al., 2006). In effect, modifications made at the planning stage which do not usually occur during text generation are central to writers' revision behaviours. In most instances, these forms of revisions are not seen by the audience for whom the text is being produced but they largely determine the quality of the text.

Apart from the preceding kind of internal revision, writers may plan to write a particular paragraph, sentence, clause, phrase, word or sub-word but substitute, add to or delete the whole or aspects of it before they actually write or type on the composing medium (Lindgren, 2005; Lindgren & Sullivan, 2006). These may happen at the proposal or translation stage of the text-generation process and away from planning.

Although internal revisions may not be captured with keystroke logging software, they are vital in obtaining a full understanding of the circumstances surrounding the external revisions made and, therefore, help in better evaluating the linguistic or revision competence of a writer. For instance, a writer may decide to avoid a particular word or grammatical feature because they are not sure of its spelling or form. A cancellation of (aspects of) the final word (because the writer notices it is incorrect) will give a more complete picture of the struggles of the writer and help in devising better pedagogical interventions for them.

## Methods

### Research design

The study employed a case study design. It sought to obtain an exhaustive understanding of the revision behaviours of senior high school students during the writing of an essay in a fairly naturalistic environment (Creswell, 2013). Almost no control was exerted over the participants' abilities and opportunities for revision. The conditions created for the collection of data were therefore very similar to those that obtained in the natural assessment settings the participants were used to. Again, the study attempts to apply in a handwriting context an analytical model designed for explaining revision in online contexts.

### Sample and sampling procedure

The participants of the study were twenty-four students from three senior high schools (Categories A, B and C) in Greater Accra<sup>1</sup>; these schools and the participants from them were selected using convenience and purposive sampling techniques. In each school, the students were informed about the study and the activities that it would involve. They were then allowed to choose whether they wanted to participate in it or not. A number of students were obtained from all the five major programmes in each school: General Arts, Science, Business, Visual Arts, and Agricultural Science/Home Economics. Having conveniently sampled these students, training was offered to them on how to verbalise their thoughts for the think-aloud task. Those who demonstrated abilities to effectively verbalise their thoughts were then purposively sampled to take part in the actual study.

### Instruments and administration

The instruments used in the current study were an essay writing task and an audio-recorded think-aloud writing task. Participants were engaged in a training session that lasted

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<sup>1</sup> Secondary schools in Ghana have been categorized into A, B, C, and D, based on their performance or ranking in the West African Secondary School Certificate Examination (WASSCE).

about 40 minutes. During this session, the researcher explained and modelled the think-aloud essay writing process to the participants. He then gave them opportunities to ask questions about issues they did not understand. Afterwards, the researcher gave the participants a question to practise with.

The participants who demonstrated abilities to effectively verbalise their thoughts were then made to participate in the actual session in which they wrote an argumentative essay. While they wrote, research assistants constantly observed the verbalization of their thoughts and prompted them when the assistants realized that the participants were becoming quiet. The participants' concurrent verbalisations were recorded, giving the researcher an opportunity to do continuous observation of the participants' revision behaviours later.

### **Data analysis**

Systematic procedures were followed in analysing the data. Audios of the think-aloud protocols were first transcribed verbatim. The scheme for analysing the protocols was adapted from Conijn et al. (2021). Process-based properties were coded by looking at the revision's trigger, spatial location and sequencing while product-based revisions focused on the orientation, evaluation, action and linguistic domain of the revision. Particularly, for each instance of revision, all process- and product-properties were manually coded. These were followed by classifications of the extracts according to the coding categories. Finally, the categorized extracts were described in terms of the ways in which they reflected each property they represented.

Apart from these, the essays were examined carefully to take note of portions where evidence of revisions could be found to confirm the indications in the protocols. Particularly, signs of cancellations, use of omission signs and text-deepening were noted. Even in instances, such as in pre-textual revisions, where no texts were produced nor signals found, a comparison

of the point in the protocol where the revision occurred with the specific point in the essay provided adequate room for confirming the participants' revision behaviours.

### **Validity and reliability**

In order to ensure validity and reliability of the research instruments and findings, the task was not the researcher's own creation but an adaptation of what existed in the literature. Also, analyses of the data were based on schemes adapted from existing reliable sources. Moreover, inter-rater reliability was used during the coding process. An independent rater was also employed to co-rate 20% of the data, and differences observed in the identification of features were addressed. The inter-rater reliability was 81.3%.

### **Ethical considerations**

The researcher ensured that the highest ethical and data protection standards were employed during the study. To begin with, participation in the study was on volition and not compulsory. Also, in order to ensure that the data collection did not interfere with the academic work of students, each school was made to provide a convenient time for the data collection. Additionally, participants' identities were hidden by giving them codes and advising them to use pseudonyms anytime they wanted to refer to themselves during the writing of the essay.

## **Findings**

### **Revision behaviours of the participants**

The findings show that the participants engaged in process- and product-based revisions externally and internally, the total of which occurred 235 times. Specific findings on these characteristics are presented below in terms of sample think-aloud extracts (with extracts of the essays in some instances) with their frequencies and percentage occurrences.

### Process-related revisions

Process-related revisions in the data were analysed in terms of what triggered them, their spatial location and sequence (Conijn et al., 2021).

#### Trigger

The instances of revision in the data were triggered by evaluation only, reading and evaluation of text and errors. Examples of these are shown in the Table 1 below:

**Table 1:** Showing triggers of participants' revision

Trigger	Fq. (%)	Protocol	Text	Code
Evaluation-only	129 (55)	...and invited guests, or distinguished guests? I think that's better, distinguished, distinguished guests...	...Distinguished guests...	Rev21
Reading and evaluating text	36 (15)	...and the languages, and the languages that would be, the languages there, sorry, so the languages there will be new to the person.	...and the languages that [that CANCELLED] there would be new to the person.	Rev16
Error	70 (30)	...comparing the country's, eerm, eei, comparing the facilities abroad, abroad, abroad and in my country	Comparing the country's [country's CANCELLED] facilities in [in CANCELLED] abroad and in my country...	Rev91

Table 1 shows that the highest instances of revisions (55%) had evaluation-only triggers. These evaluations mainly occurred prior to transcription and were mostly noticeable in the think-aloud protocols. Evaluation triggers were followed by error triggers (30%) particularly when in the course of translation, the writers noticed a mishap between what they had proposed/translated and what they were transcribing. The third in rank (15%) were triggered by reading and evaluation of text; these manifested as post-transcription attempts made by the participants.

### Spatial location

Spatial location involved the points at which the revision occurred in the process of composing. These were examined in terms of pre-textual, pre-contextual, contextual and post-textual revisions. Table 2 below provides examples of these spatial locations in the data.

**Table 2:** Showing instances of spatial locations of errors

Spatial location	Fq. (%)	Protocol	Text	Code
Pre-textual	86 (37)	I can say also looking at recent situations in terms of, let's say, in terms of eerrm, in terms of you learning or in terms of our syllabus, hmm, yeah, hmm, people will bear in mind, no let me not say that, if I bring that one, it is actually giving my opponents the advantage over me. Yeah, that's the thing. It's actually like I am deviating or something.	NO TEXT	Rev27

Pre-contextual	82 (35)	...if they want, if they get the chance...	...ifthey want [want CANCELLED] get the chance	Rev162
Post-textual	43 (18)	...will be higher than his own country, country people, people, people.	...will be higher thanhis own country people. [people INSERTED]	Rev205
Contextual	24 (10)	So in the same country, in, in one's own country, in one's own country...	In the[CANCELLED] one's own country,....	Rev129

As seen in Table 2, pre-textual revisions occurring before transcription were the most dominant (37%). As exemplified in Rev27, in pre-textual revisions, the participants decided to write on a given topic or transcribe a given text but decided to abandon the idea before transcription. Also, pre-contextual revisions which were the second most prevailing (35%) occurred at the end of a transcribed segment. As exemplified in Rev162, they occurred when writers decided to make changes at the leading edge of the text during text-generation. Besides these, there were post-textual revisions which were used 18% of the times. Such revisions occurred after the entire text-generation process, a time when the sole concentration of the participants was on revising their texts. Finally, contextual revisions such as exemplified in Rev129 were the least used type (10%) and occurred in the course of examining aspects of transcribed texts independently of the task of translation as found in pre-contextual revisions but before the end of text-generation. They involved moving backwards to some point of texts earlier transcribed and reading and evaluating them for appropriacy.

## Sequence

Sequence was examined by looking at the manner in which the revision was made. There were instances of single and embedded revisions in the data as shown in Table 3 below:

**Table 3:** Showing instances of revision sequences

Sequence	Fq. (%)	Protocol	Text	Code
Single	215 (91)	...because of their way of studying, of their way of their, oh sorry, their way of studying	...because of their way of studying CANCELLED]	of Rev133 [of
Embedded	20 (9)	It also gives the person, the individual, individual, eei God, why wrong like this?	...it also gives the indivedel [individel CANCELLED] individual the chance...	Rev38

Single-sequence revisions were one-stop events and were almost the only (91%) occurring sequences found. As exemplified by Rev133, the focus of the participant during such revisions was on a single issue in the proposed or transcribed text that they intended to modify. On the other hand, embedded revisions were a combination of two or more different issues at a time. In most instances, they involved a combination of pre-textual and pre-contextual revisions occurring together.

## Product-based revision

In looking at product-based revisions, attention was paid to how the revisions particularly sought to affect or did affect specific aspects and nature of the final text produced. Therefore, issues such as orientation, evaluation, action and linguistic domain were considered.



## Orientation

The findings show manifestations of formal, microsemantic and macrosemantic orientations of participants’ revisions. These are exemplified in Table 4 below:

**Table 4:** Showing instances of orientation of revision

Linguistic Orientation	Fq. (%)	Protocol	Text	Code
Micro semantic	122 (52)	Mr. chairman, studying abroad will expose people to foreign culture because.... no, this is for the motion. Let me change it.	Mr. Chairman, studying abroad will espose [sic] people to foreign culture because [ENTIRE CLAUSE CANCELLED]	Rev181
Surface / formal	84 (36)	...and, and have gone through, and have gone through their O levels and their O levels and l-e-v-e-l-s	And have gone through their “o” leveln [CANCELLED] levels...	Rev17
Macro semantic	29 (12)	...as the lead speaker, the lead speaker, lead speaker, yeah, it makes sense, right? Principal, lead, as the lead speaker, speaker on the motion, the motion...	...as the lead speaker on the motion...	Rev142

Table 4 shows that the participants corrected surface/formal errors 34% of the times. These revisions occurred in terms of spelling, abbreviations and punctuations as shown in Rev17. Besides these, microsemantic changes involving such issues as adding/removing supporting information, changing emphasis, understatement, coherence and cohesiveness were evident and

were the most occurring (55%) in the data. Again, macrosemantic changes which were used 8% of the times concerned discourse-level issues such as altering the overall aim, and adding/removing entire subtopics of the text.

### Evaluation

Evaluation bordered on an assessment of the target and effect of the revision made by the participants. In this regard, considerations were given first to whether the revisions were aimed at features that were errors or not. The second focus was whether the attempt made resulted in changes from errors to non-errors or from non-errors to errors, as shown in Table 5 below:

**Table 5:** Showing instances of evaluation of participants' revision

Evaluation	Fq. (%)	Protocol	Text	Code
Error revision	175 (74)	...are taught, are taught in abroad, are taught, sorry, are taught abroad than in one's own country.	...are thought [sic] in[CANCELLED] abroad than in one's own country.	Rev241
Non error revision	60 (26)	...as the lead speaker, the lead speaker, lead speaker, yeah, it makes sense, right? Principal, lead, as the lead speaker, speaker on the motion, the motion...	...as the lead speaker on the motion...	Rev142
Successful	221 (94)	So my point is more languages, sorry, more languages	...More e[CANCELLED] languages...	Rev193
Unsuccessful	14 (6)	...and they also easily, easily hired, how? Easily get, get, easily get hired in companies.	...and they are also easily get [get INSERTED] hired in companies.	Rev81

Table 5 shows that in 74% of the instances, the participants aimed at revising aspects of the texts that had errors and which would have affected the quality of their essays. However, there were instances in which the issues that were targeted were not errors. These occurrences (26%) comprised issues that the participants only wanted to provide alternative renditions for and those in which they thought the features were inaccuracies but which were actually accurate. Besides these, when examined on the basis of the success/otherwise of the attempt, 94% of the attempts were successful while 6% were not. The unsuccessful instances included those in which the participants' attempts moved the aspect of the text from non-error to error (sometimes due to omissions during reading and evaluation like in Rev81) and those in which the wrong feature remained.

### **Action**

In examining action, attention was given to the step taken in effecting the changes in pre-textual or textual segments. In all, there were manifestations of deletion, insertion and substitution as shown in Table 6.

**Table 6:** Showing instances of revision action

Action	Fq. (%)	Protocol	Text	Code
Substitution	131 (56)	It also gives the person, the individual, individual, God, why wrong like this?	...it also gives the indivedel [individel CANCELLED] individual the chance...	Rev38
Insertion	71 (30)	...the syllabus, syllable[sic], syllable[sic], being used, being used is mostly repeated but in a different way and said in a different or different way. Yes, used throughout,	the syllabules [sic] being used is mostly used throughout the levels but nothing is [is possibly inserted] changed	Rev05
Deletion	33 (14)	So my point is more languages, more sorry, more languages	...More e [e CANCELLED] languages...	Rev193

It can be observed from Table 6 that the revisions involved substitution (51%), insertion (30%) and deletion (14%). In substitution, the participants deleted segments but replaced them with others (as shown in Rev38); in insertion, they added segments such as letters, morphemes and words to textual elements, and in deletion, they invisibly or visibly cancelled segments of their texts without replacing them. The cases of deletion, however, included fifteen (15) instances (6%) that could best be considered abandonment because they were abandoned during the proposal stage before any act of transcription. An instance of this can be found in Rev27 in Table 2 under pre-textual spatial location.

## Linguistic domain

In exploring the linguistic domain of the revisions, attention was given to the level of language at which the change was made. Instances of sub-word, word, phrase, clause and paragraph level revisions were found in the data as shown in Table 7 below:

**Table 7:** Showing linguistic domains of the revisions

Domain	Fq. (%)	Protocol	Text	Code
Word	149 (63)	...of staying, studying abroad, they should study there...	...of studying abroad they should study there	Rev239
Subword	35 (15)	So my point is more languages, more languages, sorry, more languages	...More CANCELLED] languages...	Rev09
Phrase	29 (12)	In conclusion, I am for the, I am for the, so for the motion that learning abroad will be better...	In conclusion, i[sic] am for the motion [the motion INSERTED] that learning abroad will be better...	Rev14
Clause	19 (8)	Mr. chairman, studying abroad will expose people to foreign culture because.... no, this is for the motion. Let me change it.	Mr. Chairman, studying abroad will espose people to foreign culture because [ENTIRE CLAUSE CANCELLED]	Rev181

Paragraph 5 (2) I will definitely pass that (the NONE Rev39  
word limit). Hmm, or I should  
give one last point? But that's  
shoddy work. I know I can do  
better.

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As shown in Table 7, at the word level, the highest occurrences of revisions were recorded. These involved revisions within the domain of specific lexical items such as the case of 'studying' in Rev239. The next in rank, sub-word level, recorded 15% of the revisions. These revisions involved changes made to letters and morphemes. Phrasal level revisions, the third in rank, occurred 12% of the times and involved changes made in verbal, noun, adjective and prepositional phrases. The fourth and fifth occurring linguistic domains, clause and paragraph levels, were used 8% and 2% of the times as exemplified in Rev14 and Rev39 respectively.

### Discussion

The study explored the revision strategies students in English language classrooms in Ghanaian senior high schools use in text composition. The results presented under the findings section show that process-wise, the participants' revisions were triggered by error and reading, and evaluation of text occurred at pre-contextual and contextual spatial locations and had single and embedded sequences (Conijn et al., 2021). These generally point to the fact that notwithstanding the differences in contexts, the revision properties of senior high school students in handwriting ESL settings and those of university students in first language online writing settings (as found in previous studies) are fairly similar. This provides some grounds for generalizing the revision behaviours of writers.

In spite of the manifestation of the foregoing revision properties, the relatively smaller number of occurrences of reading- and evaluation-based (20%) as well as contextual (10%)

and post-textual (18%) revisions indicate that the participants were less-skilled writers who undertook less-purposive revisions (Oliver, 2018). The infrequent use of these strategies of revision has the potential to leave so many errors unattended to. An explanation to this assertion is that error-driven revisions occur during text-generation, a period where the combined efforts of writers' working memory resources are primarily dedicated to translation and transcription; this limits their (writers') ability to effectively detect anomalies (Kellogg, 2008; Lu, 2010). Most of the evaluation-only triggers are also largely effective in the face of an efficient monitor and may therefore put less-skilled writers at a disadvantage. The dominance of evaluation-only triggers is therefore a weakness in the participants' revision behaviours. On the contrary, making time for reading and evaluation provides unique opportunities for a significant number of errors to be detected and corrected since all working memory resources are devoted to the task of revision-only during the period (Hayes, 1996).

Additionally, the deployment of more single-sequenced revisions (91%) than embedded-sequenced (9%) revisions may signal unique characteristics of the overall cognitive abilities of the participants. For example, the existence of a visible spelling error in a sentence that has just been revised by a writer in a single-sequence revision may be indicative of constraints in the linguistic resources that the writer has. Similarly, where the attempt to correct one error (substituting a lexical item for a more appropriate one) leads to another error (the wrong spelling of the appropriate item), the writer could be considered to have limited process knowledge.

One interesting finding is that there were key manifestations of post-textual revisions which could be decoupled from contextual revisions because they revealed how the writers competently dedicated time for review after text-generation (Hayes & Flower, 1981). While contextual revisions are away from the leading edge, they occur at a time when

the text-generation process is still ongoing. However, where writers complete the task of generating text and read over the entire essay to 'right' their wrongs, it looks more appropriate to distinctly describe it as post-textual.

Besides the external revision properties described, there were some evidence of internal revision. The data show that there were evaluation-only triggers as well as pre-textual spatial locations of revisions which manifested in the thought-processes of the participants. The effective use of this pre-textual revision strategy implies that errors that could have been transcribed before corrected would not get transcribed in the first place. In pen-and-paper settings, this goes a long way to improve the tidiness of the essay. Again, it reveals the reflective mechanism of the brain during the sub-process of proposing and translating (see: Hayes, 2014) since it shows how mental processes are orchestrated to edit texts prior to their generation. Moreover, it must be emphasised that the extent of significance of these characteristics in the data (55% for evaluation-only triggers and 37% for pre-textual spatial locations) shows that internal revision may play a more dominant role than external revision in determining essay quality.

Besides the process-based characteristics of the revision behaviours of the participants, the product-based characteristics of their revisions also generally showed similarities with those of keystroke logging participants and in terms of aspects of orientation, evaluation, action and linguistic domain (in earlier studies such as Conijn et al., 2021). Following similar patterns of those of the process-based characteristics, formal and microsemantic features (totalling 86%) dominated the orientation of the revision while structures at lower ranks of grammar (i.e., Sub-word and word=75%) dominated its linguistic domains. These findings corroborate findings of similar studies on the revision behaviours of non-native writers in pre-university contexts (Conijn et al., 2021; Hu, 2022). As novice writers, it is not unusual for them to pay the most attention to local rather than global issues, making their revisions affect only shallower



structures of their texts. This focus on local issues is another weakness in the revision behaviours of the students. This observation is in line with that of Hayes and Olinghouse (2015) who found that novice writers believe that revision should be restricted to sentence-level text modifications. Additionally, these writers had generally limited proficiency in the language of composing as compared to their counterparts in native speaker contexts (Kellogg et al., 2013). This explains why they focused more on sub-word and word-level anomalies. Theoretically, these point to the extent to which linguistic and non-linguistic resources in writers' long-term memory could serve to provide affordances and constraints for their revisions (Hayes & Flower, 1981; Kim et al., 2021).

Notwithstanding the limitations in the selection and use of the foregoing product-based revision behaviours, the participants successfully employed deletions, insertions and substitutions to change aspects of their texts from error to non-error states. These consequently improved the quality of their essays at a cursory look. This corroborates findings in works situated in first language contexts such as Myhill and Jones (2007) and hence points to some generalities in product-based patterns too. The significant success chalked by the participants in this area (94%) is also similar to that (95%) of their counterparts in native speaker settings and at advanced educational levels (Conijn et al., 2021). It must be observed, however, that in the case of the current participants, these successes were confined within the formal features and lower-level grammatical issues described in the preceding lines.

### **Pedagogical implications of findings**

The findings of the study have some implications for the teaching of writing in the classroom in Ghana and, by extension, ESL learning classrooms generally.

One pedagogical implication is that teachers in English language classrooms in Ghana need to train their students on the

effective use of revision strategies in essay writing. For example, teachers need to train students to employ post-textual revision and to focus on larger linguistic domains during the revision process. This training would help the students to write more accurate essays, at least in terms of linguistic features (Polio et al., 1998). This is because it has been observed that the skill of revising can best be acquired in a cognitive apprenticeship where the teacher or a more competent other practically shows the student or the novice the way (Kellogg, 2008). Indeed, the nature and quality of students' revision should not be expected to be better than the amount of explicit instruction they have received on revision strategies (Hayes & Olinghouse, 2015).

Similarly, teachers need to develop the overall writing-related cognitive and metacognitive skills of their students (Graham, 2019; Wei & Zhang, 2020). Cognitive writing strategies such as idea generation and goal-setting in planning can provide adequate information and direction for writing tasks, reduce cognitive load on the brain during translation and aid the effective deployment of revision strategies. Also, metacognitive consciousness such as mindfulness of one's process knowledge can play significant roles in learners' choice of writing strategy for a given writing task which can impact the effectiveness of their revision.

Finally, it is incumbent on English language instructors to change the narrative regarding the overall insufficient attention that has been observed to be given to writing in the language classroom (Graham, 2019). Where teachers pay more attention to the development of other language skills than writing, students will have insufficient knowledge of the characteristics for writing specific genres. These writing instructions need to be accompanied by opportunities for deliberate practice and for constant feedback on students' writing which should be tailored to meet students' preferences (Oblie, 2019). Students should also be given regular writing tasks on topics they are familiar with so that they can put their revision and other composing strategies to constant use (Kellogg, 2008).

## Conclusion

The study has provided insights into the unique ways by which ESL students in senior high schools in Greater Accra ‘right’ their wrongs during text composition. Again, from an evaluative perspective, the paper has revealed how aspects of the process and product based properties of the students’ revisions either fulfil or fall short of expectations accounting for their composing competence. Furthermore, it has somewhat shown how general certain aspects of writer revision behaviours are since the participants’ traits as writers in a second-language pre-university pen-and-paper setting compares with their counterparts in other distinct settings (such as in Conijn et al, 2021).

The study was limited in two ways. Its examination of product-based revision behaviours was largely constrained by the fact that the determinations of these behaviours were limited to the utterances participants made in the think-aloud protocols coupled with the visible changes made on their scripts. As such, formal changes in terms of the insertion of punctuation marks and some instances of capitalisation such as a change from a lower case ‘l’ to an upper case ‘L’ could not be detected in some instances. This is where keystroke logging mechanisms provide superior analytical tools over manual ones. Again, the study was limited to the revision behaviours of the participants and therefore did not compare the behaviours with the overall quality of the essays written.

Based on the findings of the study and its limitations, the following recommendations are made for future studies. It is recommended that future studies combine keystroke logging software with think-aloud instruments in non-native contexts so that one would make up for the deficiency in the other. There is also the need to complement these instruments with videos and interviews as well as compare writers’ revision behaviours with their written essays in order to give a more vivid account of their revision behaviours.

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