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"A Terrible Beauty Is Born": Opportunities and New Perspectives for Online Teaching and Assessment

"Nasce una terribile bellezza": opportunità e nuove prospettive per la didattica e la valutazione online

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A Comparison between
EFL Writing Errors in Computer-Based and Paper-Based Assignments

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Abstract

Advances in writing technologies have fostered the gradual move from Paper-Based (PB) to Computer-Based (CB) writing assessment in foreign language (FL) education. The trend was further boosted by the outburst of the Covid-19 pandemic, which led to drastic changes in teaching and assessment practices. In higher education (HE) contexts, writing assessment in English as a foreign language (EFL) is more and more often managed by means of online learning platforms, where students create and submit written assignments on the computer. This paper examines a sample of 100 EFL exam essays completed by 100 Italian university students. Half of the essays were computer-typed on Moodle from home during the Covid-19 lockdown, whereas the other half were handwritten on paper during a face-to-face exam session after the Covid-19 emergency. The study presented herein compares the amount and types of formal errors in the CB and PB written assignments respectively. The results of the comparison may be useful to suggest hypotheses on the impact that both writing modality and environment can have on the quality of EFL writing in assessment contexts.

Keywords: computer-based writing; EFL writing errors; higher education; paper-based writing; writing assessment; writing technologies.

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1. Introduction

Traditionally, writing is defined in relation to the paper-based modality. However, most writing today is performed through computer-based

media. Not only that, but with the advent of new digital technologies and the ubiquitous use of electronic devices, writing has become a routine activity in the everyday life of the vast majority of people, including students, whose writing – in and outside school – is now mostly performed "by typing in electronic text" (Kohler 2015, 131).

The features of writing produced by means of digital technology have long been explored in the context of computer-mediated communication (CMC) research (e.g. Crystal 2011; Barton and Lee 2013; Tagg 2015), and a number of studies have investigated the impact of digital writing on writing practices and performances at different levels of education (e.g. Baer 2004; MacArthur 2006; Leander 2009; Crook and Bennet 2010; Purcell, Buchanan, and Friedrich 2013; Wollscheid, Sjastaad, and Tømte 2016; Baker and Lastrapes 2019; Hamouma and Menezla 2019; Hort 2020). Indeed, it seems undeniable that new technologies have become the norm in education, and they are more and more often used for teaching, learning, and assessment purposes. As laptops, tablets, and smartphones are increasingly replacing pen-and-paper, typewriting is gradually marginalising handwriting in the school routine. Typing on a keyboard or a touchscreen is quite common in the educational environment today (e.g. Mang and Wardley 2012; Spitzer 2014; Kiefer *et al.* 2015), from primary- through to higher-education contexts, where students typewrite for different purposes, from note taking to the fulfilment of home or class written assignments, up to the production of writing in testing contexts.

The impact of the medium/modality[1] on the student's written performance has been investigated with a focus on different aspects. Several studies have explored the effects of handwriting versus typewriting on students' learning (e.g. Mangen and Valey 2010; Mueller and Hoppenheimer 2014; Askvik, van der Weel, and van der Meer 2020), and others have speculated on the usefulness of handwriting in the digital era (e.g. Petrescu 2014; Karavanidou 2017). Further research has investigated students' perceptions of their performance when writing on paper or on the computer in their first (e.g Mogey *et al.* 2010) or foreign language (Endres 2012). In the field of FL education, the cognitive (Shaw and Weir 2007; Guapacha Chamorro 2022), and pedagogical (e.g. Hirvela 2005; Li 2006) implications of computer-based versus handwritten writing have been researched, as well as the equivalence and reliability of computer-based versus paper-based FL writing assessment

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[1] The two terms are used interchangeably, as they are closely related.

(e.g. Lee 2004; Weir *et al.* 2007). A number of studies have described (and sometimes explained) writing errors in FL writing (e.g. Chuang and Nesi 2006; Chan 2010; Wu and Garza 2014; Polat 2018), but fewer (e.g. Yu *et al.* 2016; Zhang and Min 2019) have been carried out with the specific aim of describing and comparing the nature and distribution of errors in paper-based (PB) and computer-based (CB) foreign-language (FL) writing in higher education (HE).

The study presented in this paper is a comparative analysis of the amount and types of errors in exam essays written with different tools (computer vs. pen-and-paper) and in different environments (online vs. face-to-face) by 100 Italian university English as a foreign language (EFL) learners. The errors were identified, categorized, quantified, described and compared with the aim of drawing tentative conclusions about the impact that both the tool and the environment may have on the formal quality of writing in exam settings.

2. WRITING AND NEW TECHNOLOGIES

It seems undeniable that the introduction of new writing technologies has an impact on writing and writing practices, in that new technologies create new writing environments and new writing styles (Williams and Beam 2019). For example, numerous studies on the nature of digital communication have described writing performed in virtual environments as 'hybrid', that is, sharing features of speech, like the use of contracted forms, the prevalence of simple sentences and coordinating conjunctions, or the pragmatic use of capitalization and punctuation (e.g. Crystal 2001; Baron 2003, 2008; Herring 2012; Facchinetti and Caleffi 2015). Moreover, although it has been claimed (Yamaç Öztürk and Mutlu 2020, 1) that "studies related to writing instruction and writing skills are generally based on traditional paper-and-pencil-based writing activities" and that "[t]raditional skills and strategies like hand-writing, spelling, structuring of words, sentences and paragraphs, and writing strategies form the basis of these studies, which are limited to traditional classroom environments and traditional writing styles" (*ibid.*), in fact, research on writing and writing practices has increasingly been focussing on the impact of new writing tools on literacy practices (e.g. Edwards-Groves 2011; Kervin and Mantei 2016; Ching 2018; Overstreet 2022). As Overstreet (2022, 1) puts it, "the field's new wave

of […] scholarship is informed by a common belief that how writers write matters, [and] how writers write is changing".

In the educational setting, the relevance of both technology (writing tool) and environmental context (either physical or virtual) to writing practices, processes, outputs and assessment became especially evident during the Covid-19 pandemic, when lockdown policies in the majority of countries around the world forced an abrupt migration from onsite to online teaching and assessment, with a powerful impact on educational programs (Mondol and Mohiuddin 2020; Saidy and Sura 2020; Al-Bargi 2022). As it happened for other disciplines, the impact concerned also the field of English language teaching (ELT), particularly EFL writing and writing assessment, as EFL learners and teachers had to suddenly face the challenge of respectively fulfilling and assessing written assignments exclusively in a computer-mediated context. Undoubtedly, digital technologies had already been long applied in ELT before the outbreak of Covid-19 (e.g. Warschauer and Whittaker 1997; Warschauer and Cook 1999; Dudeney and Hockly 2007; Erban, Ban, and Castañeda 2009), and the pandemic 'only' "accelerated the integration of technology in different language learning contexts" (Ghanbari and Nowroozi 2021, 11). Still, given the increasingly extensive use of computer-mediated tools boosted by the Covid-19 emergency, further investigation into the impact that both writing modality and writing environment may have on the formal quality of EFL writing, and into the repercussions of such impact on EFL writing assessment, may be useful to both researchers and practitioners.

3. EFL WRITING ASSESSMENT

As Lund (2016, 48) argues, "writing is a central element in foreign language education", in that not only does writing practice support the development of writing skills, but it also improves "the learners' mastery of the language more generally" (*ibid.*). This stance is in line with that of the advocates of the crucial role of writing as a tool for learning in general (e.g. Langer and Applebee 1987; Jones, Turner, and Street 1999; Klein *et al.* 2014), and language learning in particular (e.g. Cumming 1990; Manchón and Roca de Larios 2007; Ortega 2009; Manchón 2011; Williams 2012; Hirvela, Hyland, and Manchón 2016). In this regard, Manchón (2011, 61) speaks of the "writing-to-learn the language

dimension of L2 [Second Language] writing", arguing for the "intersection between L2 writing and SLA [Second Language Acquisition]" (*ibid.*, 62). Lund adds that "when writing is used as a tool for learning, it can be used to reflect, to reproduce facts, [...] to reformulate issues, [...], and to structure new knowledge" (2016, 49). Yet, one may claim that the prime aim of writing assessment in FL education seems far from being fully clear (Caleffi 2022a). On the one hand, writing can be looked at as a product, in which case writing assessment primarily aims to evaluate the formal quality of the written output (grammar, spelling, punctuation, etc.) against the standards of the target language; on the other hand, FL writing can be used as a tool to assess the knowledge of content, and writing tasks may be assigned "so that students can demonstrate that they know something" Fulwiler's (1982, 15). In this case, writing assessment may become primarily knowledge assessment, thus shifting the focus from form to content.

This is particularly true of the English language. Indeed, as a result of HE internationalization policies, English is increasingly used as a medium of instruction (EMI) (Dearden and Macaro 2016). Consequently, it has become the vehicular language of content assessment for a number of disciplines, such assessment being often carried out by means of written assignments (Caleffi 2022a). This may pose the question of whether these written assignments should be assessed on the basis of form, content, or both, which may result into a mismatch between focus-on-form and focus-on-content when it comes to evaluating writing produced in EFL. Yet, form and content are closely intertwined in writing – which is not 'negotiable', especially when produced for assessment purposes – wherefore the quality of the form does impact the quality of the content, and vice versa. Hence, being writing technology-dependent, more attention should be paid to the affordances of different technologies and their effect on writing itself.

With specific reference to EFL writing assessment in HE, given that English writing is both an object of assessment *per se* and an assessment tool to test the knowledge of content, investigations into the effects that variables like writing modality and environment can have on the formal quality of the EFL-written output may provide useful data about the 'surface' features mainly affected by these variables. Moreover, they can not only possibly suggest remedial interventions, but also offer some insight into the impact they may have on EFL writing assessment *per se*, and on EFL writing as a means of content assessment, that is, on its potential as a learning instrument.

4. Error classification

In language teaching, errors have traditionally been conceived, in broad terms, as "learners' deviations from native-speaker standard norms" (Grazzi 2021, 49). The occurrence of learners' deviations has been attributed in time to different factors, including the interlanguage hypothesis (Selinker 1973), interference of first language (L1) habits (e.g. Webster, Ward, and Craig 1987; Behla 1999), structural differences between the learner's L1 and the target language (e.g. Camilleri 2004), or the teacher's insufficient/inadequate input (e.g. Odii *et al.* 2017).

The importance of studying learners' errors was advocated by Corder (1967) with reference to the field of SLA. Corder noted (1967, 167) that "a learner's errors [...] are significant in [that] they provide to the researcher evidence of how language is learned or acquired, what strategies or procedures the learner is employing in the discovery of the language". Indeed, error analysis (EA) (Corder 1981) found its place as a scientific method between the 1960s and 1970s. Researchers began to observe, examine and classify errors and to explain them by identifying their sources (Richards 1971; 1974), which appeared to be related to more elements than only structural differences/similarities between L1 and L2, as claimed by the so-called contrastive analysis approach (Lado 1957).

Several categories of errors have been proposed until then. For example, Richards (1971) distinguishes between 'interference errors' (caused by L1 transfer); 'intralingual errors' (caused by the incomplete or over-generalized application of the target-language rules), and 'developmental errors' (caused by faulty hypothesis in the target language). Dulay and Burt (1974) speak of 'unique errors', namely those errors that are neither developmental nor interference. Stenson (1983) adds the category of 'induced errors', resulting from incorrect language instruction.

In their volume *Language Two*, Dulay, Burt and Krashen (1982) suggest a categorization of errors based not so much on their (inferred) sources, but, instead, on *observable* surface features, and propose *descriptive* taxonomies. Errors are classified into four different categories, namely: 'linguistic category' (e.g. syntactic and morphological errors); 'surface strategy taxonomy' (e.g. omissions; malformations; wrong word order); 'comparative taxonomy' (i.e. developmental and interlingual errors); 'communicative effect taxonomy' (i.e. errors hindering successful communication). The descriptive taxonomies proposed by these scholars

have been widely used as a framework for the categorization of errors. Indeed, the notion of error as a 'deviation from the norm' appears to lend itself more easily to classifications like the 'linguistic' and 'surface strategy' taxonomies identified by Dulay, Burt and Krashen (1982), as they seem to provide a 'concrete' guideline for language teachers. A classification of errors based on *observable* surface features which can be measured against fixed standard/native speaker usage parameters offers a clear grid for teachers when assessing their students' production. This is particularly true in the case of students' writing, which provides a concrete and visible product for assessors to apply the rules of the target in a (supposedly) objective way.

Grazzi's (2021) definition of error and Dulay, Burt and Krashen's (1982) 'linguistic category' and 'surface strategy' taxonomies provide the principal references for the identification and categorization of errors in the study presented herein.

5. The study

5.1. *Typewriting versus handwriting*

As already highlighted, today most of writing is done by means of digital devices, rather than by hand. The switch from pen-and-paper to mouse-keyboard-and-screen entails major differences in the haptics of writing. Mangen and Velay (2010) provide a detailed description of the difference between the two writing modalities and highlight the "unimanual and graphomotor components of handwriting [...] [which can make hand-writing] a slower process than typewriting" (*ibid.*, 385-386).

It must be remarked, as Zhang and Min (2019) point out, that there are differences and similarities between the terms 'computer-based writing', 'writing with word processors' and 'typewriting'. According to the scholars while 'computer-based writing' may encompass the possibility for the writer to take advantage of tools such as online dictionaries or instant machine translation, 'writing with word processors' "only allows writers to make use of the spelling and grammar check that comes with the word processing software. 'Typewriting', on the other hand, seems to merely suggest the writing behaviour" (*ibid.*, 3). However, the two scholars further highlight that "computer-based writing is defined

in a *narrow*[2] way in an exam context. The computer-based exam [...] only differs from conventional exams in the use of a keyboard to type rather than writing by hand [...]. No other function is allowed to assist with writing composition" (*ibid.*).

The analysis presented in the next sections is based on Zhang and Min's (2019) definition of typewriting as opposed to handwriting with reference to the writing behaviour, and on their explanation of what is meant by computer-based writing in an *exam* context.

5.2. *Corpus and methodology*

5.2.1. Corpus

The present study is based on the analysis of a sample of 100 EFL written assignments completed by 100 university students in the fourth year of a Master's Degree Programme in primary education. In the fourth year of this Degree, students are supposed to have achieved a B1+ level in English. The student writers in this study are mainly females (93 out of 100), and they are all native speakers of Italian learning English as a foreign language. The assignments are essay-based exam texts completed in two separate exam sessions scheduled at the end of a 32-hour EFL laboratory on the use of storytelling to teach EFL to young learners (YL). In this regard, it must be said that although storytelling is an oral activity, the teacher running the laboratory has traditionally assessed her students through writing[3], by means of which she tests the learners' knowledge of the laboratory contents. It is worth pointing out that the students attending this laboratory are not provided with any specific writing instruction, as they are supposed to have worked on their writing skills in the previous years' EFL laboratories.

The 100-sample corpus is divided into two subcorpora, namely the CB subcorpus and the PB subcorpus. The former consists of 50 type-written texts completed from home on the Moodle platform during the Covid-19 lockdown in 2021, whereas the latter is made up of 50 handwritten texts produced during a face-to-face exam session in the months following the Covid-19 emergency in 2022. The students who

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[2] My emphasis.
[3] The very high number of students would make an oral examination difficult to organize and extremely time consuming.

wrote their text on Moodle did not have access to any writing-assistance functions and could only typewrite on the computer keyboard. No auto-correction was running either. The students were connected on Zoom via their mobile phones and since the examination could not be held on an anti-plagiarism browser, the students were asked to use the video camera of their smartphones to let the four invigilating teachers/assistants see the workstation (desk, screen, and keyboard). They were also asked to keep their microphone on all the time to allow the monitoring of the noise in the background. Similarly, the students who produced the PB essays could only use pen and paper to write their assignments, and they were not allowed to use any other tools or devices, neither dictionaries, grammars, class notes, or the like. They could write a draft copy, if they wished to do so. Recommendations were made to use clear handwriting. Two teachers invigilated the exam session.

For both the CB and the PB assignments, the students were asked to write an essay concerning respectively the qualities of a good storyteller-teacher (CB corpus) and the benefits of using authentic picture books in the EFL classroom (PB essays). In both exam sessions, the students had one hour to complete the task, and they were all instructed to write between 120-150 words. No word counter was available for the students who wrote their essay on the computer, thus they had to count words manually, just like the students who handwrote their assignments. The CB texts were submitted directly from the Moodle platform, while the PB ones were handed in by the students themselves at the end of the exam session.

5.2.2. Methodology

For my study, I retrieved the sample assignments of the CB subcorpus directly from the Moodle platform and saved them in a Word file. As for the PB subcorpus, I asked the laboratory teacher permission to access the handwritten texts. I first photocopied the original papers, and then I typed the photocopied texts *verbatim* and saved them in a Word file in order to facilitate the analysis. The retyping of the PB essays was double-checked with the help of a research assistant, to make sure that the text in the typed version corresponded exactly to the handwritten original.

It must be noted that all the assignments in the two subcorpora had already been graded by the laboratory teacher. The original versions

of the students' texts were still visible, as well as the teacher's interventions. These concerned exclusively the form. In the case of the CB essays, the formal errors were highlighted directly in the text, while a few-word note concerning the content was provided in a separate box on the same Moodle page, only if the text revealed misunderstanding (or nonunderstanding) of the content itself. In the case of the PB assignments, the incorrect forms were underlined in red, while a few-word note was available at the bottom of the page, and only if the content was incorrect. In both subcorpora, the form-related errors were only highlighted/underlined, with no provision of the correct form. No information about the type of error was provided either[4]. The teacher's corrections were useful to my analysis as an aid to double-check my detection of formal errors.

As an initial step, I carried out a first reading of all the essays. This allowed me to locate and classify the types of errors that were present in the texts. In this regard, it must be said that my approach to the reading of the essays was corpus-driven, as the aim of my analysis was to detect formal 'deviations' from the standard (Grazzi 2021), bearing in mind Dulay, Burt and Krashen's (1982) descriptive 'linguistic category' and 'surface strategy taxonomy', to which I added, as explained in the following lines, the lexical area (see also Caleffi 2022b).

Based on the errors I had identified, for both subcorpora I designed a table in which I divided the errors into five main categories, namely spelling errors, morphological errors, syntactic errors, morphosyntacitc errors, and lexical errors[5]. In the spelling errors category I included misspelling (e.g. *wich*) and capitalization (e.g. *reading the story isn't enough*). As for the morphological errors, I included in this category word forms (e.g. *the teacher has to chose*) and word class (e.g. *pupils learn easier*). In the syntax category, instead, I considered errors connected to word order (e.g. *teachers should read a lot of times the book*), omission/

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[4] Students can ask to see their exam papers any time, and they can discuss their errors with the teacher, who will provide them with individual feedback. It seems, however, that this opportunity is only rarely exploited by students.

[5] It must be highlighted that in some cases the assignment of an error to a specific category may be debatable. In my corpus, for example, in the sentence *they can use the words in another contest*, I considered the word 'contest' a lexical error, although I am aware it may be categorized as a spelling error, instead. In cases like this, one has to establish a criterion for the error assignment. The criterion I adopted in this and similar examples was to regard as spelling mistakes only patent mispellings producing a non-existing word.

addition of articles (e.g. *a picture book with linear plot*) and omission/ addition of subjects (e.g. *she uses books that they are*) or verbs (*when they reading the book*), verb patterns (e.g. *ask to the children*) as well as errors related to subordination (e.g. *change the story for facilitate comprehension*). I classified as morphosyntactic errors occurrences of incorrect number agreement (e.g. *this books*) and subject/verb agreement (e.g *the teacher use pictures*). Finally, within the category of lexical errors I distinguished between errors related to the use of fixed expressions (e.g. *in according with*) or idioms (e.g. *keep a contact eye with the children*) and phrasal verbs (e.g. *listen the teacher*); collocations (e.g. *do attention to the children*); word choice (e.g. *tell the history*) and invented words (e.g. *soft cuscines*). Besides this classification of formal errors, I also considered the use of discursive solutions showing the use of a non-academic register. For example, contracted forms (e.g. *it's important that*), informal words/expressions, like the use of *so* both as an intensifier (e.g. *this is so important because then they can start using them in life*) and a coordinating conjunction (e.g. *they are useful so the teacher should read them*), or the inappropriate use of punctuation marks (e.g. *teacher has to show interest!!*), whose presence might suggest some degree of 'interference' of digital writing in traditional academic writing[6].

As a further step, I read all the essays again, and for each essay I manually[7] counted the number of occurrences of each type of error. The results of the analysis are presented in the next sections.

5.3. *Analysis of the written assignments*

5.3.1. CB subcorpus

The CB subcorpus is made up of 8,847 running words, and the average length of the essays is of 177 words. With reference to the type of errors, *Table 1* below shows the findings of my analysis.

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[6] See section 2 above.

[7] Considering the small size of my corpus, I decided to analyze my data manually as this would allow me to detect any type of error which might not be detected by software tools.

Table 1. – Error types and tokens in the CB subcorpus.

Category	Type of error	Error tokens
Spelling	Misspelling	171
	Capitalization	20 + 1 fully capitalized essay
Morphology	Word form	106
	Word class	24
Syntax	Word order	32
	Addition of *a*	5
	Addition of *the*	31
	Omission of *a*	15
	Omission of *the*	42
	Omission of subject	12
	Omission of verb	4
	Addition of subject	7
	Addition of verb	1
	Verb pattern	24
	Subordination	28
Morphosyntax	Number agreement	27
	Subject/Verb agreement	42
Lexicon	Fixed expression/idiom	19
	Phrasal verb	7
	Collocation	8
	Word choice	42
	Invented word	3

Table 2 below summarizes the total amount of error occurrences in each category in the CB subcorpus.

Table 2. – Total error tokens per category in the CB subcorpus.

Category	Total error tokens
Spelling	191
Morphology	130
Syntax	201
Morphosyntax	69
Lexicon	79

As we can see from *Tables 1* and *2* above, the highest number of errors in the CB subcorpus is in the area of syntax, and the most frequent error in this area is the omission of the definite article (e.g. *catch child's attention*). Spelling errors are very frequent too, especially misspellings (e.g. *to performe*), although there are also many examples of a wrong use of capitalization (e.g. *english* or *use Props*, *objects*, *puppets*, etc.), with one essay being fully capitalized. In the area of morphology, the use of wrong word forms (e.g. *a EFL class*) is far more frequent than that of a wrong word class (e.g. *know the book very well before to read its in class*). As for the area of lexicon, the errors in the subcorpus mostly concern the word choice category (e.g. *during the lecture of the book*). Agreement also seems to be a problem, with cases of both wrong subject/verb agreement – mostly when the subject is the 3rd person singular (e.g. *the teacher have to know the story by heart*) – and wrong number agreement (e.g. *a different tones of voice*).

Finally, as for the presence of features of informal register, *Table 3* shows the number of occurrences of informal solutions that I found in the CB subcorpus.

Table 3. – *Features of informal register in the CB subcorpus.*

Informal register feature	Total occurrences
Short forms (e.g. *it's*, *isn't*, *hasn't*, *what's*, etc.)	64
...	5
!	9
so (used as an intensifier or a conjunction)	165

5.3.2. PB subcorpus

The PB subcorpus consists of 7,113 running words, and the average length of the essays is of 142 words. With reference to the type of error, *Table 4* below shows the findings of my analysis.

Table 4. – *Error types and tokens in the PB subcorpus.*

Category	Type of error	Error tokens
Spelling	Misspelling	58
	Capitalization	6 + 13 fully capitalized essay
Morphology	Word form	63
	Word class	24

Category	Type of error	Error tokens
	Word order	22
	Addition of *a*	8
	Addition of *the*	61
	Omission of *a*	18
	Omission of *the*	40
Syntax	Omission of subject	6
	Omission of verb	2
	Addition of subject	1
	Addition of verb	2
	Verb pattern	18
	Subordination	19
Morphosyntax	Number agreement	29
	Subject/Verb agreement	26
	Fixed expression/idiom	19
	Phrasal verb	8
Lexicon	Collocation	4
	Word choice	43
	Invented word	8

Table 5 below summarizes the total amount of error occurrences in each category in the PB subcorpus.

Table 5. – Total error tokens per category in the PB subcorpus.

Category	Total error tokens
Spelling	64
Morphology	87
Syntax	197
Morphosyntax	55
Lexicon	82

Finally, concerning the presence of features of informal register, *Table 6* shows the number of occurrences of informal solutions that I found in the CB subcorpus.

Table 6. – Features of informal register in the PB subcorpus.

Informal register feature	Total occurrences
Short forms (e.g. *it's, isn't, hasn't, what's,* etc.)	35
...	–
!	5
so (used as an intensifier or a conjunction)	154

As we can see from *Tables 4* and *5* above, the highest number of errors in the PB subcorpus is in the area of syntax, and the most frequent error in this area is the addition of the definite article (e.g. *the picture books allow the children to learn*). In the area of morphology, the use of wrong word forms (e.g. *the teacher can use flashcard to teach the new words*) is more frequent than that of a wrong word class (e.g. *in the picture books there are rhymes, alliteration and onomatopoeic to convey rhythm to the story*). As for the area of lexicon, the errors in the subcorpus mostly concern the word choice type (e.g. *they can use the words in another contest*). About the spelling errors in the subcorpus, it is worth highlighting that, as shown in *Table 4*, 13 essays are fully written in the upper case. Problems with agreement seem to almost equally concern subject/verb (e.g. *they contains*) and number agreement (e.g. *these type of books*).

5.4. *A comparison between CB and PB assignments*

Although the number of essays in the two subcorpora is the same, the total number of running words is different. This can be due to the fact that typing is quicker than handwriting, and therefore the students who took the exam on Moodle may have had the opportunity to write more, as shown by the higher average number of words in their essays. Moreover, it must be said that most of the students who completed the assignment in the pen-and-paper modality also handwrote a draft copy, which undoubtedly took more time than the time one needs to delete a text chunk from a screen and type it again. Still, despite the difference in terms of number, a comparison between the two subcorpora seems possible.

To begin with, in *Table 7* the five categories of errors are listed in descending order (from the one with the most tokens to the one with the fewest) in each subcorpus.

*Table 7. – Categories in descending order in each subcorpus
(from most error tokens to fewest error tokens).*

ORDER	CB SUBCORPUS	PB SUBCORPUS
1st	syntax	syntax
2nd	spelling	morphology
3rd	morphology	lexicon
4th	lexicon	spelling
5th	morphosyntax	morphosyntax

As we can see from *Table 7*, the most interesting findings concern syntax and spelling. In both subcorpora the category with the highest number of errors is syntax. Spelling, on the contrary, is the second area in terms of error tokens in the CB subcorpus, while it is the fourth in the PB subcorpus.

As for syntax, although in both corpora the main problem in this area concerns the use of the definite article, it seems that in the CB subcorpus the trend is to omit it (e.g. *choose books that are suitable to children's age*) while in the PB subcorpus it is exactly the opposite, that is, the definite article tends to be added, rather than omitted (e.g. *the picture books have clear illustrations, which can help the children with the comprehension of the story*). One tentative explanation could be, once again, the speed of typing, which might lead to the 'involuntary' omission of words perceived as 'superfluous'. Secondly, syntactically speaking the essays in the CB subcorpus are mostly made up of simple sentences (e.g. *The right reading of the picture book is the most important competence for a good storyteller-teacher. The teacher could be a good reader. For a reading it's necessary the performance. A good storyteller-teacher should increases child's curiosity.*) and, on the whole, parataxis is far more frequent than hypotaxis. This might be due both to the student's limited command of the English syntax, but also to the typing speed, which leads to a more 'fast-paced' narrative. Indeed, the 'pace' of writing in the examined CB essays may somehow recall that of speech. Very often, clauses are separated by commas, rather than by a full stop (e.g. *Some tips could be for example to use the voice and the body, teacher can change the voice every time the character change*) or by a colon (e.g. *He/She uses his/her voice: change voices according to characters.*), both punctuation marks being frequently used in contexts where they may not be appropriate in academic writing (e.g., respectively, *Finally, could be appreciable: the presence, of rhymes, alliterations and repetitions* and *The*

teacher performs the story: whit facial expressions, whit her hands and mime the words.). Still in terms of punctuation, its use is generally inconsistent and fairly random. For example, linkers are randomly followed by a comma (e.g. *Second the teacher should perform*). In the essays of the PB subcorpus, syntax appears to be characterized by more hypotaxis, with a slightly higher use of complex sentences (e.g. *picture books can be beneficial when learning English as a foreign language because they can help children improve their knowledge of grammar and vocabulary*) and of higher-register connectors (e.g. *furthermore*, *in addition*, *all in all*, *whereas*, *in spite of*, *on one hand … on the other*) as in *on one hand picturebooks contain repetition which help children to learn chunks of language and new words. On the other hand picturebooks, in particular the authentic one, have got short text, clear illustrations and predictable plots that keep students motivated and on focus*. Also punctuation appears to be used more accurately than in the CB, although, as in the typewritten essays, linkers are inconsistently followed by a comma (e.g. *Moreover a good picture book contains a concrete and natural language* vs. *finally, picturebooks include a natural language*).

Concerning spelling, it seems worthwhile remarking that, even though the different number of running words in the two subcorpora makes it more difficult to compare errors quantitatively than qualitatively, one can notice that misspelling is far more frequent in the CB essays. Again, this can be due to the speed of typewriting, which may easily lead to misspelling, although one more factor could be the writer's typing ability. The fact that technological constraints or features may affect the student's spelling performance makes it difficult to understand whether the misspelling is 'simply' a typo or, instead, is due to gaps in the student's knowledge of spelling norms. Instead, misspelling in handwriting may be more easily ascribable directly to the student's spelling skills, since the pen-and-paper writing modality allows more control on the written word. Still about spelling, it is worth reminding that 13 of the 50 essays in the PB are fully written in the upper case. A feature, the latter, which is often found in digital writing, usually to replace prosody (e.g. Facchinetti and Caleffi 2015).

With regard to morphology, both the CB and PB essays show a by far higher number of errors related to the word form (e.g. *these books could be use as "mentor book" because they are used for a long time*) than to the use of the wrong word class (e.g. *another important think is the setting*). In the CB subcorpus occurrences of wrong word form are much higher than in the PB subcorpus, which might suggest that the high

typing-speed can lead the writer to devote less attention to the shape of words, as it seems to happen with spelling.

Morphosyntax is the category with the fewest error tokens. However, considering the lower number of words in the PC corpus, occurrences of morphosyntactic errors like wrong number agreement (e.g. *for each children*) or wrong subject/verb agreement (e.g. *they contains rhymes*) may, on the whole, appear higher than in the CB subcorpus. Interestingly, in the CB essays there are more occurrences of wrong subject/verb agreement than of number agreement. As subject/verb agreement could be regarded as related to syntax more closely than number agreement, it might be inferred that CB writing tends to be syntactically less accurate than PB writing in this respect. Once again, one may attribute this to either the student's low command of syntax, or to the typing speed 'allowing' less time for a double check of agreement.

In the area of lexicon, the occurrences of lexical errors in the CB subcorpus and in the PB subcorpus are very similar both in terms of quantity (79 vs. 82) and quality (most lexical errors concern the use of a wrong word for the specific context, as in *it's important telling the story seriously*). However, if we consider the lower number of running words in the PB subcorpus, we can say that there are more lexical errors in the PB essays than in the CB ones. Moreover, still considering the different number of running words, we can also notice that in the PB subcorpus there are more invented words (e.g. *accumulative stories*) than in the CB subcorpus.

Finally, as far as features of informal register are concerned, it should be highlighted that in both subcorpora the use of low-register solutions (like short forms, or the exclamation mark) is very limited. In this regard, it might be interesting to notice that in the whole corpus there are three occurrences of the lowercase *i* for uppercase *I*. This could suggest that the use of lowercase *i*, which has been noted in contexts of digital communication such as instant messaging (e.g. Tagliamonte and Derek 2008; Squires 2010; Charters 2014) or user-generated comments (e.g. Dahlström 2012), this non-standard form might with time find its way into academic writing, although the small-scale study presented here does not allow to make any predictions in this regard.

One last aspect which seems worth considering is related to the layout of the texts. While almost all the essays in the CB subcorpus are organized as one-paragraph texts, those in the PB subcorpus display a multi-paragraph structure. Yet, the paragraphs themselves are not organized in the traditional academic writing style (new topic - new para-

graph), with a trend to start a new paragraph at the end of each sentence, irrespective of the 'change of topic'[8]. Hence, although not corresponding (except in some cases) to the typical structure of academic essays (introduction, body, conclusion), the layout of the handwritten texts seems to display some form of organization, while that of the typewritten essays appears to reflect the fast-paced narrative mentioned above.

6. Conclusions

The main aim of this paper was to explore the impact of both writing modality and environment on the formal quality of the written output. To this purpose, a study was conducted to compare the types and tokens of formal errors in CB and PB essays produced by EFL learners within the context of summative assessment in HE carried out remotely and face-to-face respectively. Although the number of samples analyzed in the study is too small to make any generalizations, and despite the limitations of a manual analysis, some tentative conclusions are still possible, which may encourage reflection on the pedagogical repercussions that different writing modalities and environments may have not only on EFL writing assessment *per se* but also on the use of EFL writing itself as a form of assessment.

First of all, the study did not reveal striking differences between computer-based and paper-based written assignments. In terms of error types, the five categories within which the detected errors were included were perfectly fit for the classification of errors in both subcorpora. In terms of total number of error tokens, the reported data showed a higher number of occurrences of errors in the CB based subcorpus compared to the PB one (670 vs. 485 respectively) and more occurrences of informal register features (243 vs. 194).

Considering the impact of the writing modality on the formal quality of writing, although the higher number of total error tokens in the CB subcorpus may be due to the higher number or running words, one might claim that CB writing seems likely to produce more formal errors than PB writing and to facilitate the 'intrusion' of speech-like features (like short forms, simple sentences, lowercase *i*). In this regard, one possible explanation could be that CB academic writing recalls the

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[8] One essay in the PB subcorpus is even structured in bullet points.

writing modality (computer-mediated) and environment (virtual setting) of digital communication.

Spelling and syntax appear to be the areas mostly affected by the writing modality. The data show that typewritten texts contain more spelling errors than handwritten texts, and that parataxis is more frequent than hypotaxis, which makes the 'pace' of CB writing faster and more similar to the pace of speech. It could be argued that both spelling errors and the use of parataxis may be triggered by the typing speed, and not necessarily by the student's low competence in these areas of EFL.

The comparison between the hand- and the typewritten-assignments also revealed that students tend to organize their writing more carefully when they use the pen-and-paper modality. Evidence of this is that most of the collected PB assignments were first produced as draft copies, and then meticulously rewritten in their final versions. Draft copies can be valuable learning tools and teaching resources for learners and teachers respectively, as they show that (and how) students plan and organize their writing. Writing a draft copy gives learners the opportunity to approach writing as a process which develops through several stages (Lee 2002), thus offering them the chance to reflect not only on the form (how to write), but also on the content (what to write). As for teachers, draft copies can be used to see where learners had difficulties during the writing process, and how they resolved their difficulties. This could provide teachers with very useful information for both writing instruction and writing assessment. Instead, all this precious information is lost with CB writing, as it does not allow to track the stages of the writing process.

As for the influence of the environment, the higher number of errors found in the analyzed CB essays could be related to the exam setting in which the writing task was performed. Indeed, the CB assignments were typed on the computer in isolation, from home, on a virtual platform, the invigilators being only virtually 'present'. This may have affected the student's approach to the writing task, his/her concentration, and even the perception of the 'exam context' and of the purposes of his/her writing. It could be claimed that writing performed on a virtual learning platform may recall the 'sloppiness' of digital writing (Baron 2008) and somehow distract the student from the very aim of their writing, even if this is performed for assessment purposes. Moreover, writing 'in isolation' by typing on a keyboard while seeing the text-in-progress 'flowing' fast on the computer screen could emphasize the student's perception of academic writing as an inherently solitary, de-contextualized and

detached activity (Caleffi 2022a). Instead, undertaking academic writing assessment in the physical setting of a classroom, with the student's teacher and classmates sharing space and time, may contribute to the perception of the writing environment as a specific social context, where writing is embedded as a 'situated practice' (Barton, Hamilton, and Ivanič 2000), and therefore becomes a real, practical and concrete activity performed for a specific purpose.

In conclusion, relying exclusively on computer-based modalities and virtual environments for the assessment of EFL writing – and for the assessment of content through EFL writing – may lead EFL practitioners to underestimate the value of writing as a learning tool for *both* language and content. The "unimanual and graphomotor components" (Mangen and Velay 2010, 385) of handwriting offer EFL learners the opportunity to slow down the pace of their writing, which results in a more careful planning of the text and leaves more time to reflect on the target language. At the same time, handwriting provides the opportunity for teachers to help their learners not only with the target language, but also with the writing process in that language. Which is why this paper suggests considering the potential benefits of the pen-and-paper modality in EFL writing (Lund 2016), as well as those offered by undertaking EFL writing assessment and assessment *through* EFL writing in shared physical spaces.

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