

A MODEL OF THE QUALITY OF REVISIONS IN A WORD-PROCESSED TEXT

by
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This study presents a model of the factors affecting the quality of revisions in a word processed text. Such factors are, for example: basic IT skills, EFL writing ability, time spent on revisions, the quality of the first produced draft, and so on. First-year university students, advanced in computing, were asked to write one argumentative essay, to which they returned three days later in order to revise it. Each of the writing and revision sessions did not exceed one-and-a-half hours. Both the original and the revised essay were written on the computer; the students were not allowed to print their texts out. The analysis revealed that (a) the students' EFL writing ability had an indirect influence on the technical quality of the texts (wording, usage, punctuation, and spelling) and on its structure (ideas, organization); (b) basic IT skills did not influence quality of the revision (neither as to its technical aspects nor to its structure); (c) the quality of the first produced draft indirectly affected the quality revision in a statistically significant manner; and (d) time did not influence either factor of revision quality. The implications of these findings are discussed and a focus for future research is suggested.

Introduction

Over the past two decades, more than 200 studies have examined the impact of word processing on both student writing and revision (Goldberg et al. 2003). These studies have focused on students who were generally less accustomed to working with computer technologies, as compared to students today. The research on the effects of computers upon writing and revision showed that there were many ways in which writing on computers might help students produce a quality written outcome (Goldberg et al. 2003). Most of the studies conducted reported that when students wrote and revised on the computer, they tended to produce longer texts and make more revisions. Additionally, previous research has revealed that writing and

revising with the help of a computer could increase the amount of writing and revising that students perform, and the extent to which students edited their writing and revisions (Daiute 1986; Etchinson 1989; Vacc 1987; Sengupta 2000), which in turn led to higher quality writing and revision (Hannafin & Dalton 1987; Kerchner & Kistinger 1984; Williamson & Pence 1989; Wallace et al. 1996).

Study objective

This study's objective was to create a model of the factors that, according to previous literature, could affect the quality of revisions: basic IT skills, English as a foreign language (EFL) writing ability, the quality of the first produced draft, and time spent on revisions. From the standpoint of the manageability of data collection, the context of the study has been restricted to Greek university students with various levels of experience in word processing.

The article is structured as follows: The next section presents the literature review. The research hypotheses, framework, research method and the discussion of measures follow. Then, the data analysis and results are discussed. Finally, the implications of the findings of this study are presented, along with the recommended focus of future research.

Literature review

In a meta-analytic study, Goldberg et al. (2003) located 200 studies on the effect of computers on student writing and revision for the period 1992–2002. Among all these studies, only 15 examined the effects of word processing upon the quality of revisions, compared to the use of paper and pencil: Owston et al. (1992), Hagler (1993), Jones (1994), Jackiewicz (1995), Keetley (1995), Lam and Pennington (1995), Nichols (1996), Lichtenstein (1996), Wolfe et al. (1996), Breese et al. (1996),

Langone et al. (1996), Jones and Pellegrino (1996), Lerew (1997), Dybdahl et al. (1997), and Head (2000).

Moreover, two additional studies focused on the impact of computers upon the quality of the writing produced, but did not include paper-and-pencil comparison groups. For this reason, these two studies were not included in the meta-analysis. Gallick (1997) reported a large positive, statistically significant effect of word processors upon the quality of writing in her single-group designed study, and Hood (1994) reported a large positive, yet statistically insignificant effect of word processors upon the quality of revisions. Another study, conducted by Snyder (1993), included paper-and-pencil comparison groups, but did not provide enough statistical data for inclusion in the data analyses. Snyder (1993) reported no mean differences between the computerized and paper-and-pencil groups, but variance estimates were not provided and could not be calculated, based on the reported statistics.

When aggregated across all studies, the mean effect size indicated that, on average, the writings of students who developed their writing and revision skills, while using a computer, were 0.4 standard deviations higher in quality than those of students who had learned to write and revise on paper only. Moreover, the effect of writing with computers upon the quality of writing and revising was larger for middle and high school students than for elementary school ones. In all the above studies, the factors that mostly affected the quality of revisions were keyboard experience and students' academic achievement. As a result, there is a lack of research on additional factors affecting the quality of revisions. This study attempts to show that (besides basic IT skills), English as a foreign language (EFL) writing ability, the quality of the first produced draft, and time spent on revisions also influence the quality of revisions. As a consequence, research hypotheses were formed and a framework developed, as detailed in the following.

Research hypotheses and framework

A conceptual framework was created based on evidence from the previous studies, as well as from a quantitative, qualitative, and ex-post factum analysis of the pilot phase of this study, previously published in *Computer Assisted Language Learning* (Kehagia and Cox 1997) (see Figure 1). Within this framework, a possible link between EFL writing ability (EFLWA in Figure 1) and the quality of the revisions based on the quality of the first printed draft (QFPD in Figure 1) and the time spent on revision was hypothesized. According to this hypothesis, students with more EFL ability could improve the ideas, organization, wording, punctuation, spelling and usage of appropriate words in their essays. The same was expected with regard to the students' IT skills. It was also expected that the higher the quality of the students' first draft, the lower the quality of revisions, as the students were expected to be satisfied with their first quality draft and therefore did not conduct many revisions in subsequent drafts. Finally, it was expected that the more time the students spent on revisions, the higher the quality of their revisions would be.

Based on the above explanation of the research framework, the following research hypotheses are proposed:

H1: The more advanced the writers' basic IT skills, the higher the quality of possible revisions.

H2: First draft quality intervenes in the relationship between students' basic IT skills and the quality of revisions.

H3: Time spent on revisions intervenes in the relationship between students' basic IT skills and the quality of revisions.

H4: The higher the writers' EFL writing ability, the higher the quality of revisions.

H5: First draft quality intervenes in the relationship between students' EFL writing ability and the quality of revisions.

H6: Time spent on revision intervenes in the relationship between students' EFL writing ability and the quality of revisions.

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H7: The higher the quality of the students' first draft, the lower the quality of revisions.

H8: The more time spent on revisions, the higher the quality of the revisions.

A framework regarding the quality of revisions in an EFL writing context, when word processors are used, is shown in Figure 1.

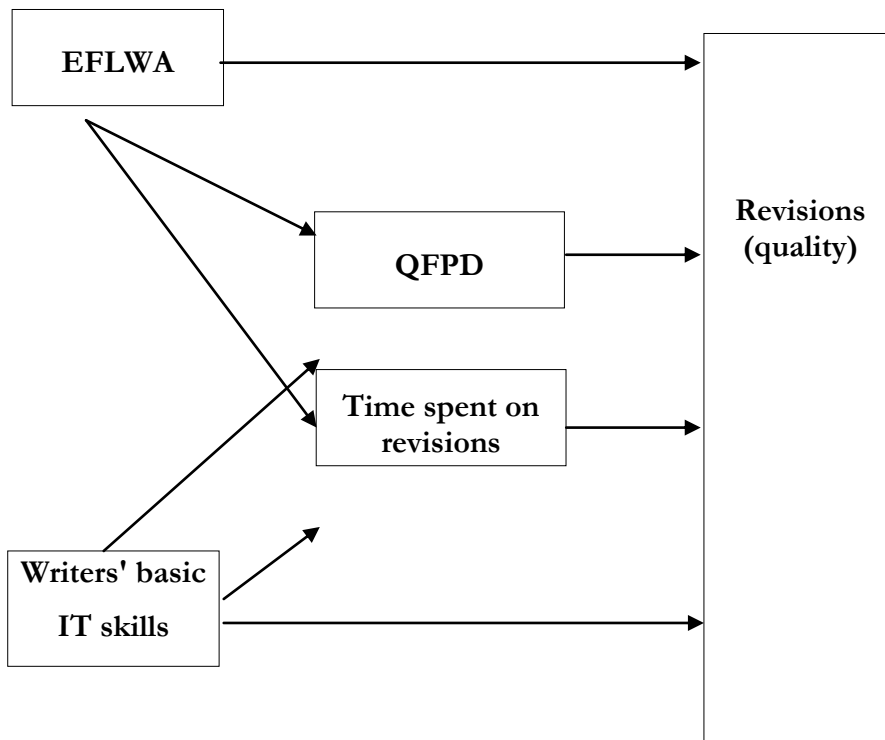


Figure 1: *The Framework*

Sample and methodology

The study involved 46 university students from different faculties at the University of Thessaly, Greece. First-year (second semester) students from different faculties were chosen, as they all needed to learn English.

Fifteen of the students were male and 31 were female. The students were chosen randomly according to their willingness to take part in this study and the requirement of being 18 years of age (or over). Their writing ability was good, as their EFL writing ability scores show (see Table 1). The writing ability was another criterion of selection, because if all the students had the same writing ability, then the products of their revisions would be easily comparable. Students had also studied English for seven years before entering the university and had been obliged to write some of their assignments in English, using computers, prior to this study. The students' EFL writing ability was ensured by assessing their texts, including many of an argumentative nature, for six months prior to the study.

Student	Total (max = 100)	Student	Total (max = 100)
P1	86	P25	80
P2	74	P26	80
P3	64	P27	71
P4	86	P28	65
P5	74	P29	65
P6	15	P30	65
P7	77	P31	67
P8	77	P32	95
P9	71	P33	95
P10	95	P34	95
P11	45	P35	95
P12	68	P36	80
P13	86	P37	80
P14	65	P38	65
P15	83	P39	95
P16	71	P40	65
P17	89	P41	65
P18	71	P42	65
P19	71	P43	65
P20	80	P44	80
P21	63	P45	80
P22	63	P46	68
P23	74	Average	73.69
P24	61	Standard Deviation	14.43

Table 1: *EFL writing ability*

No students with disabilities took part in this study, and no cooperation between students was allowed. The specific size of the sample was chosen to meet the statistical assumptions for quantitative analysis.¹ University students were selected because (a) they would be more likely to select information, cross out, edit, draw, rehearse, revise, and reorganize their texts than would be high school students (Willinsky 1989), and (b) the positive effects of word processing appeared to be unequivocal for college-age writers (Sommers 1985; Bernhardt et al. 1987).

Prior to the study, a questionnaire requesting information on basic IT skills was distributed to the students. All students worked on PCs connected to three printers. It was not necessary to instruct the students on the program they used for writing, as they had already used it for other writing purposes. Previous EFL academic papers were corrected by two academics with a background in teaching EFL.

The measures of the experiment were as follows:

1. *Basic IT skills:* As one of the reasons for this research was to measure how computer basic IT skills (those obtained when using word processors) would affect the drafting and redrafting of essays written in an EFL context, a questionnaire was designed including seven questions. The questionnaire was based on an earlier questionnaire used by Woodrow (1991) and Pelgrum and Plomb (1993) (see Table 1). The answers to the seven questions were distributed along a five-point Likert interval-type scale (1 = not at all; 5 = very much so). The questionnaire was limited to the students' perceptions of their competence in using computers and an application program, but it was not the primary aim of this research to measure extensive word processing skills. The Likert scale was used in this research, as it is easy for respondents to understand and reply to (Malhotra 1999). Seven elements were considered for inclusion: fear of machine damage, fear of program destruction, fear of file destruction, ease in using the mouse, understanding

of the function of the commands available in the word processing package, confusion when having to retrieve files, and feeling of loss when not knowing how to navigate the operating system and how to enter and exit various software packages. The data collected on the seven questions were then subjected to exploratory factor analysis, correlation analysis, and path analysis.

2. *EFL writing ability*: As one of the aims of this research was to understand the nature of the impact of students' EFL writing ability on the types of revisions, this element had to be measured in detail. The items for EFL writing ability measurement were taken from Brown and Bailey (1984), as shown below in Table 2. These items include organization of the text, introduction and conclusion, grammar, style and quality of expression, the logical development of ideas, and punctuation. The items were drawn unmodified from the original scale, as they represented a very detailed system of scoring. In the present study, an experienced EFL university lecturer colleague and I graded the students' texts. The average score was used for subsequent analysis. The grading and measurement were conducted as before. The EFL measure was a detailed measure of expertise. There was also a need for the quality of the specific produced draft to be measured. This involved a second, complementary technique, to be explained in the following section.

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	Excellent to good	Good to adequate	Adequate to fair	Unacceptable	Not college-level work
Organisation, introduction, body and conclusion	Appropriate title, effective introductory paragraph, topic is stated, leads to body; transitional expressions used; arrangement of material shows plan (could be outlined by reader); supporting evidence given for generalisations; conclusions logical and complete.	Adequate introduction and conclusion; body of essay is acceptable but some evidence may be lacking, some ideas aren't fully developed; sequence is logical.	Mediocre or scant introduction or conclusion; problems with the order of ideas in body; the generalisations may not be fully supported by the evidence given; problems of organisation interfere.	Shaky or minimally recognisable introduction; organisation can barely be seen; severe problems with ordering of ideas; lack of supporting evidence; conclusion weak or illogical; inadequate effort at organization.	Absence of introduction or conclusion; no apparent organisation of body; severe lack of supporting evidence; writer has not made any effort to organise the composition (could not be outlined by reader).
Logical development of ideas: content	Essay addresses topic; the ideas are concrete and thoroughly developed; no extraneous material; essay reflects thought.	Essay addresses the issues but misses some points; ideas could be more fully developed; some extraneous material is present.	Development of ideas not complete or essay is somewhat off the topic; paragraphs aren't divided exactly right.	Ideas incomplete; essay does not reflect careful thinking or was hurriedly written; inadequate effort in area of content.	Essay is completely inadequate and does not reflect college-level work; no apparent effort to consider the topic carefully.
Grammar	Native-like fluency in English grammar; correct use of relative clauses, prepositions, modals, articles, verb forms, and tense sequencing.	Advanced proficiency in English grammar; some grammar problems don't influence communication, although the reader is aware of them.	Ideas are getting through to the reader but grammar problems are apparent and have a negative effect on communication.	Numerous serious grammar problems interfere with communication of the writer's ideas; grammar review of some areas clearly needed; difficult to read sentences.	Severe grammar problems interfere greatly with the message; reader can't understand what the writer was trying to say; unintelligible sentence structure.

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Punctuation, spelling and mechanics	Correct use of English writing conventions; left and right margins, all needed capitals, paragraphs indented, punctuation and spelling; very neat.	Some problems with writing conventions or punctuation; occasional spelling errors; left margin correct; paper is neat and legible.	Uses general writing conventions but has errors; spelling problems distract reader; punctuation errors interfere with ideas.	Serious problems with format of paper; parts of essay not legible; errors in sentence-final punctuation; unacceptable to educated readers.	Complete disregard for English writing conventions; paper illegible; obvious capitals missing, no margins, severe spelling problems.
Style and quality of expression	Precise vocabulary usage; use of parallel structures; concise; register good.	Attempts variety; good vocabulary; not wordy; register OK; style fairly concise.	Some vocabulary misused; lacks awareness of register; may be too wordy.	Poor expression of ideas; problems in vocabulary; lacks variety of structure.	Inappropriate use of vocabulary; no concept of register or sentence variety.

Table 2: *EFL writing expertise scale*
(Source: Brown and Bailey 1984)

3. *Quality of the first produced draft*: Pilot phase analyses (see Kehagia and Cox 1997) confirmed the importance of the inclusion of the variable 'quality of the first produced draft' in this study. Quality was measured according to Diederich's (1974) analytic Quality Scale. The specific measure was adopted for the following reasons: (a) it appeared to validly and reliably measure the quality of a piece of text (Diamantopoulos and Schlegelmilch 1997); (b) it is a method of measurement familiar to most people working in education, as it employs factors that do not involve sophisticated descriptions of linguistic features (Bridwell 1980); and (c) high reliability can be achieved by employing the above, if those rating the work come from relevant subject backgrounds (Bridwell 1980), as in this research.

In Diederich's (1974) scale, written texts earn up to ten points each for ideas and organization and up to five points each for wording, punctuation, spelling, and usage, with a maximum of

40 points for each script. A text that receives a high score in content must have its main ideas clearly supported, whereas a low score indicates that the rater has had difficulty in determining what views the writer is discussing. Similarly, a high score for organization suggests a text with a detectable plan, whereas a low score indicates a text with confusing organization. A high rating for wording (not measured on the EFL scale) requires the writer to use precise vocabulary, while a poor rating indicates the inappropriate use of vocabulary. The categories of punctuation and spelling measure the mechanics of a text (Diederich 1974). The grades given by the two independent academic EFL examiners were compared and inter-coder reliability was examined. The two sets of grades were averaged for each item of the scale and were then used in the subsequent analysis.

4. *Time spent on revisions:* This was measured in minutes. Given a number of cases with missing data, only the amount of time spent on the revisions in absolute time periods (minutes spent on revision) was used in the subsequent analysis. The periods were identified from the clock time of the revision draft files saved on disk. The total period (from original saved text to last revision) was calculated.
5. *Quality of revisions:* The quality of revisions was measured in the same way as was the quality of the first produced draft.

Analysis

Three types of analysis were used in this study: factor, correlation, and path analysis. A series of product moment correlations (see Table 3) were established, comparing basic IT skills, EFL writing ability, the quality of the first produced draft, the time spent on revisions, and the

quality of revisions. The analysis was conducted to measure the associations among the above variables.

	BITS	EFLWA	QFPD	TIME	QUAL-MECH	QUAL-STRUC
BITS	1.00					
EFLWA	0.03	1.00				
QFPD	0.21	0.56**	1.00			
TIME	0.08	0.46**	0.23	1.00		
QUAL-MECH	-0.00	0.51**	0.55**	0.14	1.00	
QUAL-STRUC	0.07	0.21	0.46**	-0.00	0.56**	1.00

* $p < .10$ ** $p < .05$ *** $p < .01$

Abbreviations:

BITS	Basic IT skills
EFLWA	English as a foreign language (EFL) writing ability
QFPD	Quality of the first printed draft
TIME	Time spent on revisions
QUAL-MECH	Quality mechanics
QUAL-STRUC	Quality text structure

Table 3: *Pearson product moment correlation coefficients between independent (basic IT skills, EFL writing ability, quality of the first produced draft, time spent on revisions) and dependent variables (quality of revisions)*

Exploratory factor analysis (see Table 4) was used to establish if all the indicators of the variables formed a factor, and to determine that the items that tapped these factors could be identified (Hair et al. 1995). The factor items were then subjected to reliability tests. Cronbach's coefficient alpha, a generalized measure of the internal consistency of a multi-item scale, was high. Validity was also examined to ensure that a particular measure was free from error due to misleading questions, the omission of alternatives, coding mistakes, and interviewer and

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respondent characteristics. Assessment of the factor solutions also suggested the validity of the present measures. Furthermore, the measure of sampling adequacy was adequate for the exploratory factor analysis presented here (i.e., there were four or five times as many observations as there were variables to be analyzed; Hair et al. 1995). The factor analysis conducted on the variables of this study and the reliability tests established a series of highly reliable and easily interpretable factors. The scores relevant to various items were high for basic IT skills, EFL writing ability, the quality of the first produced draft, and the quality of revisions, summated to create scales specific to each factor. No factor was produced for the time spent on revisions.

Code	Factor name	Items	Factor loading	e	Variance	a
BITS	Basic IT skills	Understanding of the function of all the commands available in the word-processing program	0.78	4.35	62.3	0.89
		Comfortable in using the mouse	0.73			
		Lack of confusion when you have to retrieve your files	0.75			
		Ease of navigation in and out of various software packages	0.89			
		Ease of entering the word-processing program	0.77			
		Lack of fear of destroying the program	0.79			
		Lack of fear of destroying own files	0.75			
EFLWA	EFL writing ability	Organization in writing	0.95	4.54	90.9	0.97
		Logical development in writing	0.94			
		Grammar in writing	0.94			
		Punctuation in writing	0.96			
		Style and quality in writing	0.95			
QFPD	Quality of the first produced draft	Ideas	0.86	4.65	66.5	0.90
		Organization	0.85			
		Wording	0.84			
		Usage	0.84			
		Punctuation	0.85			

QR	Quality of revision	Factor 1 'Mechanics' (qual-mech)				(Total variance)
		Ideas	0.34	4.34	72.4	0.94
		Organization	0.22			
		Wording	0.87			
		Usage	0.87			
		Punctuation	0.91			
		Spelling	0.88			
		Factor 2 'Text structure' (qual-struc)				
		Ideas	0.92	1.08	18.0	0.97
		Organization	0.96			
		Wording	0.35			
		Usage	0.35			
		Punctuation	0.16			
		Spelling	0.24			

Table 4: *Factor analysis of independent and dependent variables*

Finally, a path analysis was conducted to reflect a causal order between the variables. For the purposes of this present study, Cohen and Cohen's (1983) causality definition was employed. They argued that as a working method, causal analysis might require no more elaborate a conception of causality than that of common usage, indicating A as a cause of B when (a) A precedes B in time (although A and B might be measured at the same time); (b) the mechanism whereby this causal effect operates could be identified; and (c) a change in the value of A was accompanied by a change in the value of B. The path analysis shows the relationships as a set of regression equations, with each variable expressed as a linear function of the preceding variables plus the error term. The magnitude of the linkages between variables was estimated to provide information about the underlying causal processes (Asher 1983).

The simplest way to obtain the path coefficients was to regress each variable against those variables that were directly imposed upon it.

Ordinary least square (OLS) regressions were used to identify the magnitude of the effects of the independent variables upon the dependent variables in the model. Standardized path coefficients were used because of the difference in scaling between the quality of revisions and IT skills, EFL writing ability, quality of the first produced draft, and time spent on revisions. The variables used in the model were the factors established through factor analysis, tested for reliability. Statistical assumptions such as homoscedasticity regarding the use of regression were satisfied (i.e., data are said to be homoschedastic when the variance of the error term e appears constant over a range of independent variables). T-tests were used to identify the statistical significance ($p < 0.05$) of each partial regression coefficient. Some of the impacts between variables were found not to be statistically significant. To clean up the model, these impacts were eliminated and only the ones that were statistically significant were retained, as presented in Figure 2.

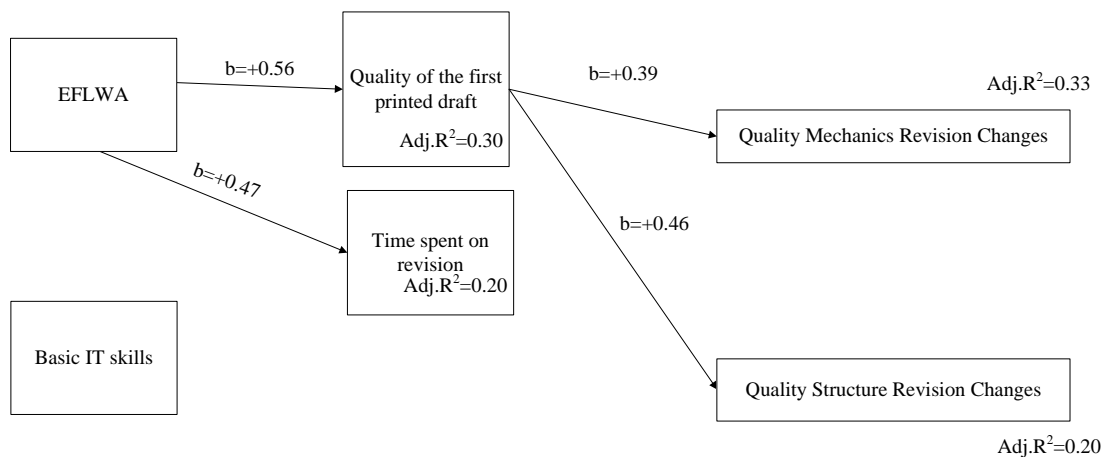


Figure 2: *The Path Analytic Model*

Results and implications

Previous research has shown uncertainty regarding whether students' basic IT skills affected the quality of their revisions (Wallace 1996; Head 2000). Despite this, the present study found that these skills did not influence any of the factors determining revision quality, as Head (2000) showed. The lack of relationship between basic IT skills and the quality of revisions showed that word processing did not influence revision. This was because the specific students taking part in this study revised only to satisfy their audience and thus were only interested in producing grammatically correct texts. The lacking association might also have something to do with the nature of the measurement of word processing skills in this study, as the scale measuring basic IT skills was limited to basic IT skills only. Another reason for a lack of relationship could be attributable to the subjective nature of students' answers, as they answered the IT questionnaire for themselves. A more objective method would be to subject the students to a series of computer literacy tests and the simulation of word processing problems.

EFL writing ability was an important variable, being a prerequisite for the improved quality of the first draft; it also drove students to spend more time on revisions. It had an indirect influence upon quality mechanics (wording, usage, punctuation, and spelling) and quality structure (ideas and organization). This meant that the impact of the EFL writing ability upon quality mechanics was channelled through the time students were willing to put into altering the gist of their texts, when they revisited their texts to make revisions. Previous studies on revising in EFL also showed no clear impact of EFL writing ability upon revision (Tillema and Van der Weijden 2003; Ferris 2002).

The indirect impact of EFL writing ability upon quality revisions implied that experience in EFL writing was necessary before writing and revising in an EFL context. As a result, this finding implied that teachers should train their students in writing in a foreign language in order to help them revise, using the appropriate words, punctuation, and spelling. Students might realize that it takes a lot of experience for a

writer to attain writing ability in a foreign language. This implies that self-learning is a potential strategy for students to help themselves start learning to revise. Exposure to more writing experiences might also be stressed here, as all these time-consuming activities were believed to affect revision. Finally, students might also learn to be systematic when revising, meaning that they might follow the teacher's exact instructions.

Time spent on revision did not influence any factor of revision quality. This finding is not in accordance with other studies, which show that writers need to spend time conducting revisions (Goldberg 2003; Sasaki 2000). Despite the fact that writing in a foreign language was fundamental to the revision process, time spent on revision was not of prime importance. This implies that it was not advisable for writers to be given substantial time, because this only affected the use of words, punctuation, and spelling of the texts, which might be an issue to consider for teachers of writing. This study thus helps to shed light on a issue which had remained relatively unexplored up until now. However, the concurrence of time's lack of impact upon quality needs to be considered alongside EFL writing ability. I must also remind the reader at this point that in this study, I postponed the students' revision process for some days after their writing of the first draft. This postponement would probably be an obstacle to revision.

The quality of the first printed draft indirectly affected both factors of revision quality. Quality was principally influenced, however, by the students' ability to write in an EFL context, although minimum IT skills appeared to be necessary. Past studies have shown that the quality of the first printed draft affected revision (Peterson 1993; Bishop 2004). The relationship between the quality of the first printed draft and the quality of the revisions suggests that teachers might encourage their students to develop a critical eye and initiative in the production of a first draft. At the same time, teachers might have the skills and the will to train their students to create a good quality first draft when writing in an EFL context. Writing ability is also necessary on the students' part in order to create quality first written drafts. This is supported by previous

research, showing that unless someone was expert in writing, a lower quality first printed draft would be produced (Sengupta 1998). Students might learn that they need to conceptualize and synthesize when they write their first draft in order to produce quality outcomes. They might also realize that in-depth knowledge and attention to detail, such as the correct use of words and the precise use of punctuation, help in the production of good quality revised outcomes from the first drafts. At the same time, students might gain the experience of looking at their texts holistically, taking care of the ideas, structure, and presentation.

Limitations and future research

This study has several limitations. Its findings were based upon a restricted number of cases. A study with a larger sample would have allowed for a greater generalizability of the findings. Another way to increase generalizability could be to create a more rounded sample, meaning that the students could be of different ages, with a wider spread of EFL writing ability and familiarity in using word processors. In this study, most of the writers were of the same (medium to high) writing ability and familiarity with word processing. Students with more widespread EFL writing ability and word processing familiarity supposedly would improve their texts to a greater extent or correct most of their errors. Another way of increasing the generalizability of the findings could be to have the students be of a different age than (one of) the writers taking part in this study. According to previous studies (Goldberg 2003; Sengupta 1998; Sengupta 2000), students of younger ages conduct more surface revisions, as they are not experienced in EFL writing.

Additionally, like previous studies, this study did not measure the revisions done on screen (Walker 1997). However, it was beyond the scope of this study to measure the on-screen revisions made by the students before they saved their first draft. This might explain why the students made only a few revisions in the intermediary drafts.

Therefore, a future study could involve more detailed measurements of the initial stages of composition of the first draft in order to capture the early revisions made on screen.

It could also be interesting to examine other aspects that were not explored in this study, such as the writers' attitudes towards word processors when revising on screen, in particular, the influence of writers' attitudes upon the types and nature of revision (as studied previously by Joram et al. 1990). A further limitation of the present study was the design of the writers' IT questionnaire. The questionnaire was designed to measure the students' IT skills, using a few very general questions about using computers. Another questionnaire with more detailed and different questions could uncover different issues surrounding IT experience.

An additional limitation was the genre of the essay that was written and revised. It is possible that writing in a different genre would emphasize different aspects of language issues and the structure of the text, providing different insights into the revision process. Moreover, it is possible that writing in a different genre could help writers to write more, carry out more extensive revisions, and give more detailed explanations of the issues covered in the text. Finally, it would be a good idea to include age and gender as variables in a future study, while conducting a qualitative analysis in order to reveal additional elements that could be investigated in more depth.

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Notes

1. 46 is a strong sample, as it exceeds 40, which is the necessary threshold sample size: 10 cases per each independent variable, thus 4 independent variables x 10 cases = 40 (Hair et al. 1995).

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