Journal of
Language and Translation
Volume 11, Number 4, 2021 (pp. 171-190)

Looking into the Paper vs. Computer Mode of the IELTS Academic Writing Module

Mehdi Dastpak[1], Mohammad Javad Riasati[2*], Ehsan Hadipourfard[3]

[1] PhD Candidate of TEFL, Shiraz Branch, Islamic Azad University, Shiraz, Iran

[2] Assistant Professor of Applied Linguistics, Shiraz Branch, Islamic Azad University, Shiraz, Iran

[3] Assistant Professor of Applied Linguistics, Shiraz Branch, Islamic Azad University, Shiraz, Iran

Received: December 10, 2020 Accepted: May 14, 2021

Abstract

The current study investigated whether EFL learners performed differently in the paper and computer modes of the IELTS academic writing module in terms of task response/achievement, coherence/cohesion, lexical resource, and grammatical range and accuracy. In addition, it explored whether the candidates' computer familiarity was different in paper and computer mode groups. To this end, 108 candidates were selected out of 144 based on the Oxford Placement Test (OPT) results in the University of Tehran, Iran. To gather the data, a retired IELTS academic writing sample and a computer familiarity questionnaire were administered. The participants were divided into two equal groups. In the Paper Mode (PM) group, the students were given the test to write in the conventional paper mode. In the other Computer Mode (CM) group, the students were given the same test but were asked to type the test in the computer provided for them in their class. Also, all the participants took the computer familiarity questionnaire. The gathered data were analyzed and the findings revealed significant differences between paper-based and computer-based modes in both writing tasks. Moreover, the questionnaire analysis showed the impact of the candidates' computer familiarity on their writing performance.

Keywords: Computer Mode; Computer Familiarity; High-stakes Writing Test; Paper Mode

* Corresponding Author's email:
mjriasati2002@yahoo.com

INTRODUCTION

According to Davies (2007), IELTS as a high-stakes test greatly influences candidates' academic and professional life and success. The two modules of IELTS, namely General and Academic, are assumed for admission to academic centers and immigration issues respectively. As Quaid (2018) expresses, the test is branded by a general proficiency theoretical model, which means underlying the test believes that there are some indivisible body of language knowledge within each test taker that is technically analyzable. This knowledge includes a fixed proficiency construct that is present to participants in the assessment process. Based on this knowledge of the language, each individual can be rated (Fulcher, 2014). The IELTS test sorts no functional or structural syllabus to model (Quaid, 2018), while it is assumed that the test takers' performance can be generalized to the real world.

The performance of each test-taker is simplified into an overall score and four elemental scores to be simply and efficiently interpreted by various stakeholders (O'Loughlin, 2011). In listening and reading, candidates obtain raw scores out of 40, equal to a 1 to 9 band score. However, the 1 to 9 band scores in Writing and Speaking are given by an examiner in four sub-criteria (IELTS, 2014), rounded to the nearest 0.5 bands if required. In the IELTS test, both tasks are scored by two different examiners, leading to a total band score that comprises an average of the two, with task two weighing more as it is longer. Ultimately, the average of the four sub-tests called band descriptors is awarded, corresponding to a description of proficiency provided by IELTS (IELTS, 2014). The five scores (numbers) which candidates receive constitute the only performance information they obtain from the test.

In the IELTS test, writing is assessed through two Tasks, namely Task 1 and Task 2. In writing Task 1, the candidates are asked to write at least 150 words summarizing a graph, table, chart, or process. They are generally told to summarize the information by selecting and reporting the main features and making comparisons relevant. The candidates are typically given three bullet points of things that they should include. Writing Task 1 is assessed based on four areas. Each one is worth 25% of marks for that section including Task Achievement, Coherence and Cohesion, Lexical Resource, Grammatical Range and Accuracy (Uysal, 2009). However, comparing Task 1 and 2, the overall score is given greater weight in writing Task 2.

Task 2 uses appropriate content, style, and registration methods to assess the candidate's ability to write discourse essays in response to open-ended prompts and organizations (Moore & Morton, 2005). For many candidates taking the IELTS test, writing Task 2 can be difficult. Writing is widely regarded as a "complex and difficult to learn the skill" (Uysal, 2009, p. 314). Although one-on-one verbal encounters with examiners may be less than in high-pressure situations (Issitt, 2008), it is still

possible to take IELTS due to tensions between candidates. This is due to the limited time required to complete two different Tasks, the use of reference materials, the unpredictability of Task topics, and other potential trait-emotional factors.

Informal assessment writing, nuances of Task requirements and assessment criteria are of high importance. For writing Task 2, this includes a different set of rules, established methods for the Task (provided to candidates in the coursebook), and detailed evaluation criteria. Learners' familiarity with these factors may affect how they interact with tasks (O'Loughlin & Wigglesworth, 2003) and, ultimately their performance.

Writing Task 2 is evaluated by trained and certified examiners using confidential band descriptors (though simplified descriptors can be made publicly available online). An examiner evaluates a candidate's composition using four equally weighted criteria, which are outlined below.

Task Response / Achievement: How the prompt is addressed; Relevance of the position presented; Support and extension of main ideas; clarity and justification of conclusions drawn.

Coherence and Cohesion: Arrangement and organization of ideas; Paragraphing; Referencing and substitution; Use of cohesive devices.

Lexical Resource: Range of lexis; Use of unique lexical items; Accuracy of lexis; Spelling and word formation.

Grammatical Range and Accuracy: Range of grammatical structures; Accuracy of grammar; Use of complex structures; Correct punctuation.

The application of computer-based education and assessment is receiving more attention (Poggio, 2005; Lottridge. 2008; Yurdabakan, 2012). However, the results of numerous studies in comparing paper mode (PM) and computer mode (CM) have resulted in no empirical evidence that CM and PM tests led to the same results. Clariana and Wallace (2002) mentioned that some factors, other than the construct being measured, may affect the results of such tests.

Some studies have investigated the performance of individuals by comparing their scores and/or writing processes in both computer and paper modes (e.g., Barkaoui, 2016; Blackhurst, 2005; Breland, Lee, &Muraki, 2004; Green &Maycock, 2004; Horkay, Bennett, Allen, Kaplan, & Yan, 2006; Jin & Yan, 2017; Lee, 2002; Li, 2006; Russell & Haney, 1997; Weir, O'Sullivan, and Jin (2007); Wolfe&Manalo, 2005). The matter that these lines of research addressed was to determine whether the scores on CM assessment show the same ability on the participants as those in PM tests that are supposed to be equal (Chapelle& Douglas, 2006). To exemplify, three independent researchers made a comparative study on the difference between scores in computer mode and paper mode of IELTS writing. The results pertinent to the study of Blackhurst 2005 and

Weir et al. 2007 showed that there were no discernible differences between modes while in one study (Green and Maycock, 2004) test-takers in the paper-based group slightly outperformed those in the computer-based one. Wolfe and Manalo (2005) found no difference between test-takers' scores in Test of English as a Foreign Language (TOEFL) tasks, although they had chosen to type or handwrite freely. In a recent study, Jin and Yan (2017) stated that students in computer-based mode attained considerably better scores than those in paper-based mode.

The studies that have investigated the effect of writing mode on the qualities of test-takers' tests are few. Some researchers such as Wolfe, Bolton, Feltovich, and Niday (1996) found that in computer mode the writings were mainly more formal and straighter than in paper mode although they were composed by the same students; but writing mode did not influence the number of errors for each writing significantly. Russell and Haney (1997) concluded that participants in the computer mode group were apt to compose more or less twice as much as those in the paper mode group and tended to shape their essays into further paragraphs compared to the paper mode group.

Chambers (2008) compared computer and paper mode groups of the second language (L2) test-takers. She found a greater level of lexical choice in the computer mode group, although their sentences and paragraphs were fewer. However, there was no significant difference between the two modes in terms of rate of lexical errors, length, punctuation and vocabulary use. Finally, Jin and Yan (2017) concluded that writings composed on computers enjoyed longer sentences and fewer errors, and they also were longer than those written on paper.

The results mentioned in the previous paragraphs propose that writing mode influences writing processes that students apply in their second language (L2) essay writing, which would impact the quality of the text they compose. In addition, differences observed in the characteristics of the essays can simply influence the test-taker's score. As an example, composing essays in computer, as the results of some pieces of research above proposed (e.g., Jin & Yan, 2017) is connected with producing longer, richer texts in terms of lexical complexity and accuracy, then there is a probability that the essays composed in computer attain better or higher scores than essays written on paper. This can describe the effect of the mode on the attained scores in L2 writing exams.

Test-takers' familiarity with writing on the computer seems to have moderate effects on their writing performance. Torrance and Galbraith (2006) believe that from a cognitive perspective, if low-level skills such as spelling and keyboarding get automatic, then they do not need attentional resources and do not limit the writing manner. Though, poor keyboarding skill redirects writers' focus of attention and cognitive resources on motor activities (i.e., typing) and, as a result, other high-order processes (e.g., revising, planning) might be left unattended to. This might result in more inferior quality of the produced text (Alves et al., 2007; Horkay et al., 2006; Wolfe & Manalo,

2005). These properties could be exaggerated for L2 writers with low computer skills when writing in computer exam settings (Wolfe & Manalo, 2005).

Although several studies have scrutinized test-takers' performance on paper and computer writings, only few have surveyed the influence of computer abilities on computer mode writing performance, particularly in L2 tests (Douglas &Hegelheimer, 2007). These studies propose that test-takers with better computer familiarity seem to achieve better scores on computer mode writing, while test-takers with lower computer familiarity tend to perform better on paper mode writing. For example, Wolfe et al. (1996) claimed that writing mode does not make a change for learners who have good to great level of experience in computer writing in their first language (L1), learners who had low level of ease and practice with computers composed shorter papers with more straightforward sentences and obtained lower marks in computer mode than writing on paper (cf. Horkay et al., 2006; Russell & Haney, 1997).

In second language writing, Maycock and Green (2005) concluded that test-takers computer practice skills did not substantially affect their performance on a computer-based mode of the IELTS writing. On the contrary, a study by Jin and Yan (2017) compared the writing performance of students who had similar language knowledge but different computer familiarity skills in paper and computer concluded that computer skill considerably moderated the effects of writing mode on the students' writing manners and scores. Hence, students with more excellent computer skill were apt to achieve higher scores in computer mode. In other words, as computer familiarity improved, writing scores increased. On the contrary, participants who had lower level of computer familiarity stated having enhanced planning while composing their writing on paper. They stressed that the computer familiarity has advantageous influences on individuals' writing style.

To sum up, there have been many studies addressing writing and the impact of using technology, specifically computer, on students' writing performance. Some pieces of research have been conducted on IELTS too; however, to the best of the researcher's knowledge, few studies have addressed this issue from the viewpoint of IELTS's writing sub skills. Moreover, since IELTS administrators intend to apply computer-mode testing, it is high time that researchers pertinent to this realm be conducted.

IELTS candidates are evaluated on four language skills: listening, speaking, reading and writing. Testing is currently in paper mode. The current research focused on the writing section of the test, which seems to be the most demanding requirement for candidates. This study compared the participants' performance on two different modes of IELTS Academic Writing, namely computer mode (CM) and paper mode (PM), taking into account the participants' computer familiarity. Accordingly, the following research questions were proposed:

RQ1. *Do IELTS candidates perform differently in paper mode and computer mode of IELTS Academic Writing Test in terms of Task response/achievement?*

RQ2. *Do IELTS candidates perform differently in paper mode and computer mode of IELTS Academic Writing Test in terms of coherence and cohesion?*

RQ3. *Do IELTS candidates perform differently in paper mode and computer mode of IELTS Academic Writing Test in terms of lexical resource?*

RQ4.*Do IELTS candidates perform differently in paper mode and computer mode of IELTS Academic Writing Test in terms of grammatical range and accuracy?*

METHOD

Participants

108 Iranian participants, who were equally categorized into Paper Mode and Computer Mode groups, were selected from 144 IELTS candidates at Tehran University (PM group = 54, CM group = 54). The participants were all adult male university students who were advanced English learners. In order to obtain proficiency-level homogeneity, all participants were selected based on their scores from Oxford Placement Test (OPT). Although the University had categorized its language learners as advanced, the researchers administered the Oxford Placement Test as it had been proved reliable and valid by Cambridge Teaching English to speakers of other languages (TESOL). Thus, the study participants were all advanced second language (L2) learners of English who were also ILETS candidates.

Materials

As mentioned earlier, the Oxford Placement Test was administered to select advanced participants for the current study. Moreover, a retired IELTS Writing Academic test and a Computer Familiarity Questionnaire were administered to gather the data for further analysis.

Oxford Placement Test (OPT)

Oxford Placement Test is a standardized proficiency test to assess students' Proficiency in English language. The OPT has been adjusted in contrast to a series of major international language examinations and can accordingly be a basis of treasured information for learners and course providers regarding appropriate course books and examination objectives, e.g. IELTS, TOEFL, TOEIC and others such as Cambridge ESOL Main Suite exams.

Administering this test would enable the researcher to have a greater understanding of the participants' proficiency levels. Hence, by administering the OPT the researchers intended to obtain participants' homogeneity regarding their proficiency level.

Normally, OPT has two sections: the first one has 40 items and students are allocated 30 to 45 minutes to do it. The second part has 20 items and the completion time allotted is 15 to

25 minutes. Only the candidates who accurately answered 36 or more questions in the first part would be permitted to move on to the next part of the test.

Retired IELTS Academic Writing Test (RIAWT)

IELTS Writing Test assesses a wide range of writing skills, including candidates' ability to provide correct answers, thought organization, and a range of vocabulary and grammar use. Examiners use four criteria to score each candidate: Task achievement, Coherence and cohesion, Lexical resource, and Grammatical range and accuracy. According to the test instructions, candidates should write at least 150 words in 20 minutes for Task one and 250 words in 40 minutes for Task two in academic writing. Each participant in the PM group of the study should do his writing in conventional pen-and-paper mode and he should type his writing in the computer if he is in the CM group.

Computer Familiarity Questionnaire (CFQ)

A Computer Familiarity Questionnaire (CFQ) comprising 14 items adopted from Weir et al. (2007) was run to both computer and paper groups to determine whether or not computer familiarity had any influence on their writing performance. The OPT test comprised three classes, each of which focused mainly on computer familiarity, namely computer usage, comfort and perceived ability, and interest in computers. The test was based on a Likert scale from 1 (Never) to 5 (Always).

Data Collection Procedure

The population of the study included the advanced adult participants from IELTS candidates at Tehran University. Accordingly, the OPT was administered according to the instructions of the test.

As was mentioned earlier, the OPT has two parts comprising 40 and 20 items, respectively. On the completion of the two parts of the test, the candidates' categorization was based on the following criteria (Asiyaban,Yamini, Bagheri, YarMohammadi, 2020):

- Scores 16–24————elementary
- Scores 25–40————intermediate
- Scores 43–55————advanced

According to the OPT rubric, the cut-off score for advanced learners is 41. This makes the classification exactness between advanced and intermediate dubious. So, the researchers decided to change the cut-off point from 41 to 43. Based on the new cut-off score, only the participants who scored 43 and higher were included in the study. The test was administered in Tehran University Exam Hall under standard test conditions. The first part of the test was corrected and marked immediately to make sure that only the students who obtained 36 or higher would continue to the second part of the test.

The data for the study were collected at Tehran University towards the end of the term, in which students had computers available to them in their classes. Students were divided

into two groups: paper mode (PM) and computer mode (CM). Before grouping the students, the chance was given to choose the CM group if they were interested in being included in that group. Hence, 47 students were voluntarily put in the CM while the other 7 students were chosen randomly. In the PM group, students were given a topic (selected from retired IELTS exams) for the academic writing module and were given 60 minutes to write both tasks in the conventional paper mode. In the CM group, the students were given the same test; however, they were asked to type in the computer provided to them in their class. It is noteworthy that all proofing functions (e.g., grammar, spell check, etc.) were disabled and those who used their own laptop were double-checked to ensure that the proofing functions are off. Also, all the standard conditions regarding the IELTS writing test, including acoustics, availability of necessary help, good reception, enough light, etc. were met. Finally, the participants in the CM group were also given the Computer Familiarity Questionnaire on the next session to determine their degree of familiarity with computers.

Reliability of the scores

Having collected the required data from the Retired IELTS Academic Writing Test, the researcher then hired two trained IELTS raters to score the participants' performance in PM and CM groups. Inter-rater reliability was conducted and computed as 0.92.

Table 1

Descriptive analysis of PM and CM groups for Task response/achievement

	Group	N	Mean	Std. Deviation	Std. Error Mean
Task	CM	54	**5.76**	.88868	.12093
	PM	54	**5.55**	.70488	.09592

Analysis procedure

To analyze the data gathered from the instruments, SPSS package version 24 was utilized. The statistical technique adopted in the study was an Independent samples *t*-test. It was used to analyze the data pertinent to the participants' performances in CM and PM group in all four band descriptors and the data germane to the Computer Familiarity Questionnaire.

RESULTS

The first research question examined whether IELTS candidates perform differently in PM and CM groups in terms of Task achievement. The results obtained from running the Independent samples *t*-test is given in Tables 1 and 2.

As shown in Tables 1 and 2, IELTS candidates in the CM group (M=5.76, SD=.888) did not perform differently from those in the PM group (M=5.55, SD=.704), (*t* (106) =1.38, *p*=.17, two-tailed).Thus the answer to the first research question is negative.

To answer the second research question, stating whether candidates performed differently in paper and computer mode in terms of coherence and cohesion, another Independent samples *t-test* was conducted. The results are depicted in Tables 3 and 4.

As presented in Tables 3 and 4, IELTS candidates performed differently in paper mode (M=4.72, SD=.45) and computer mode (M=6.50, SD=.45) in terms of coherence and cohesion (*t* (106) =20.35, *p*=.00, two-tailed).

The participants in CM group significantly gained better overall band scores than those in PM group. Hence, the answer to the second research question is positive.

The third research question explored whether IELTS candidates performed differently in paper mode and computer mode in terms of lexical resource. Accordingly, the Independent samples *t*-test was run. The results are shown in Tables 5 and 6.

Table 2

Independent samples t-test for two groups on Task response/achievement

		Levene's Test for Equality of Variances		t-test for Equality of Means					
									95% Confidence Interval of the Difference
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Task	Equal variances assumed	1.211	**.274**	1.380	106	**.171**	.21296	.15436	-.09306	.51899
	Equal variances not assumed			1.380	100.777	.171	.21296	.15436	-.09325	.51917

Table 3

Descriptive statistics of PM and CM groups for coherence and cohesion

	Group	N	Mean	Std. Deviation	Std. Error Mean
Cohesion	CM	54	**6.50**	.45557	.06200
	PM	54	**4.72**	.45211	.06152

Table 4

Independent samples t-test for two groups on coherence and cohesion

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Cohesion	Equal variances assumed	.168	**.683**	20.354	106	**.000**	1.77778	.08734	1.60461	1.95094
	Equal variances not assumed			20.354	105.994	.000	1.77778	.08734	1.60461	1.95094

Table 5

The descriptive statistics of PM and CM group for lexical resource

	Group	N	Mean	Std. Deviation	Std. Error Mean
Lexical	CM	54	**6.56**	.52347	.07124
	PM	54	**4.79**	.50017	.06807

Table 6

Independent samples t-test for two groups on lexical resource

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Lexical	Equal variances assumed	.190	**.664**	17.950	106	**.000**	1.76852	.09853	1.57318	1.96386
	Equal variances not assumed			17.950	105.781	.000	1.76852	.09853	1.57318	1.96386

According to Tables 5 and 6, the mean scores for both groups are significantly different (t (106) =17.95, p=00, two-tailed). IELTS candidates performed differently in the paper mode (M=4.7, SD=.500) from those in the computer mode (M=6.5, SD=.523) in terms of lexical resource. That is to say, the participants in CM group outperformed their counterparts in PM group. So, the answer to the third research question is positive.

The fourth research question examined whether IELTS candidates performed differently in paper mode and computer mode of academic writing in terms of grammatical range and accuracy. Again, an Independent samples t-test was conducted.

Table 7

The descriptive statistics of PM and CM group for grammatical range and accuracy

	group	N	Mean	Std. Deviation	Std. Error Mean
Grammar	CM	54	**6.22**	.56357	.07669
	PM	54	**5.01**	.62919	.08562

Table 8

Independent samples t-test for two groups on grammatical range and accuracy

		Levene's Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Grammar	Equal variances assumed	.310	**.579**	10.472	106	**.000**	1.20370	.11495	.97581	1.43160
	Equal variances not assumed			10.472	104.740	.000	1.20370	.11495	.97578	1.43163

As presented in Tables 7 and 8, IELTS candidates performed differently in paper mode (M=5.0, SD=.629) and computer mode (M=6.2, SD=.563) in terms of grammatical range and accuracy (*t* (106) = 10.47, *p*=00, two-tailed).Table 7 indicates that the participants in the CM group (M=6.9, SD=2.19) gained better overall band scores than those in the PM group.

Finally, to find out if CM candidates' computer familiarity differed from that of their counterparts in PM group, another Independent samples *t*-test was run. The results of the *t*-test confirmed that the candidates' computer familiarity in CM group was statistically different from that in the PM group. The results are presented in Tables 9 and 10.

Table 9

The descriptive statistics of PM and CM group for Computer Familiarity Questionnaire

	group	N	Mean	Std. Deviation	Std. Error Mean
CFQ	CM	54	**63.94**	4.19531	.57091
	PM	54	**61.51**	5.47289	.74477

Table 10

Independent samples t-test for two groups on CFQ

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
CFQ	Equal variances assumed	3.105	**.081**	2.585	106	**.011**	2.42593	.93841	.56544	4.28641

As presented in Tables 9 and 10, IELTS candidates answered the questions in the CFQ differently in the paper mode (M=61.51, SD=5.47) and the computer mode (M=63.94, SD=4.19), (*t* (106) =2.58, *p*=.011, two-tailed). That is to say, the participants in the CM group significantly gained better scores than those in the PM group, which confirmed higher computer familiarity of the participants in the CM group.

DISCUSSIONS

The current study investigated whether IELTS candidates performed differently in PM and CM groups of academic writing Tasks one & two in terms of Task achievement, coherence/cohesion, lexical resource, and grammatical range and accuracy. To this end, four research questions were raised whose findings are discussed hereunder.

The findings revealed that IELTS candidates did not perform differently in PM and CM modes of academic writing tasks in terms of Task achievement. This supports Neuman and Baydoun's (1998) findings who researched paper-and-pencil vs. computer testing in clerical tests. They concluded that there was no statistically significant difference between the two modes. Although no significant discrepancy was found between CM and PM, the descriptive results indicated that IELTS candidates in CM group performed marginally better than those in PM group in terms of Task response. They attributed such slight outperformance to participants' attention dedication to the argumentative essay composition in Task two. In addition, as Chan et al. (2017) suggest, there is less amount of required cognitive process in task one than in

task two due to the very nature of the task. That is to say, task two is an argumentative one whose cognitive process leads to better performance on the part of the learners.

Coherence and cohesion was the second criterion based on which the performance difference of the participants of the two groups was taken into consideration. The results showed that IELTS candidates in CM group outperformed their counterparts in PM group, verifying the positive effects of the computer mode on writing creation. In addition, regarding Task two, the participants in CM group gained better overall band scores than those in PM group in terms of coherence and cohesion. This outperformance is in line with the fact that the attention paid to the task in CM group is due to the nature of the task, which weighs more while the screen is the platform of the work. This superiority in CM group could also be due to the participants' familiarity with computer and also their preference for being categorized into CM group. Although the findings of this study are opposed to those of weir et al. (2007), concerning the influence of computer familiarity on young-adult participants' scores, this study's findings lend support to their opinion that *adults* familiar with computer tend to do better on writing tasks as they possess positive attitude towards computer. Not only can this issue be explained in terms of writers' characteristics, but also it can be approached concerning physical environment (Waes, Schellens, 2003). Studying the cognitive behavior of different writers and defining five profiles for writing adoption, Waes and Schellens, (2003) concluded that the adoption of profiles depends significantly on the constraints of their writing environment.

Lexical resource was the third criterion based on which the performance difference of the participants of the two groups was scrutinized. It can be mentioned that differing from Chan et al., 2017, who concluded that students do the same in two modes of academic writing due to the same cognitive processes they apply, the CM group gained better scores. This result could suggest that students could review and choose better vocabularies in CM mode which could be attributed to the results of our study although the cognitive process was not investigated.

Moreover, the results revealed that the two groups of the study performed differently in both tasks (one and two) regarding grammatical range and accuracy. That is, the participants in CM gained better overall band scores than those in PM group. Setting aside tasks' nature, overall, the study's findings are akin to Breland et al. (2004) and Wolfe and Manalo's (2005) who claimed that computer mode is more beneficial to proficient students than less proficient ones. As students are typing, their main focus would be on the grammaticality of the sentences and the correct choice of the forms. Therefore, they would have no concern about legibility of their hand writing. Ease of navigation was also more favored in CM group as they could quickly revise and edit their writing, thus saving their time.

Besides, the analysis of the questionnaire verified that computer familiarity seemingly influenced the candidates' scores in writing

tasks in the current study. This result is also in line and opposite to the studies regarding computer familiarity and test performance. Although the findings show that the effect of computer familiarity is weighty, to the knowledge of the researchers, an advanced adult learner who is familiar and comfortable with computer usage maximizes their writing.

Furthermore, the present study's findings align with those of Najmi's (2015) and Parsi and Sanavi's (2015) who found that utilizing technology could involve students as active learners who could adjust themselves using prompts and hints in their writings. Consequently, according to the results found in this study, assessment through technology (e.g. computer mode) in the evaluation of writing performance plays an essential role in equipping participants with the tools and strategies needed to achieve optimal output. In addition, participants in the CM group manifested overall positive perception of CM which could be perceived as an influencing factor in CM participants' performance.

Several studies have investigated the effect of the computer on L1 and L2 students' writing practices and writing quality. For instance, Shaw (2005) presented three main patterns in the findings of this line of research. First, the results are diverse, with various research finding negative impacts, some positive, and still others no effects of the computer on learners' writings. Second, the computer appears to have diverse influences on L2 writers than on L1 ones. Lastly, as most of this line of research has stressed the use of computers for educational aims, their results might have partial generalizability to assessment settings. The findings of the current study are no exception.

It seems that participants in the CM and PM groups employ different processes. According to Lee (2002), in the CM group, participants seemed to type their writing in a rough form first, then added or removed vocabularies and sentences and even paragraphs, something unmanageable in the PM group. So, it can be hypothesized that in the CM group, since revision was easier, texts could have been changed to avoid repetition and inappropriateness. Lee argues that some second language writers hired different processes and focused on different writing modes across writing modes. Moreover, the candidates in the CM group seemed to be more planned, which in turn confirmed the fact that they exhibited a higher level of adherence to the topic.

The computer also seems to have helped the candidates produce better texts and, as a result, receive higher scores in some band descriptors. In contrast, using a theory-based questionnaire of writing processes, Weir, et al. (2007) showed no significant differences in terms of scores and cognitive processes across writing modes, although adult users of computers in high proficiency stage seem to be more used to using computer.

The matter of time in computer-assisted writing is of great importance. Despite the belief that writing down by pen, typing and looking at screen can deviate students' focus from writing correctly, in most of the studies mentioned above, participants did not have any concern about the time allotted to doing the

task. Barkaouia and Knouzib (2018) concluded that when writing on the computer, students lean towards writing considerably lengthier essays comprised of a wide selection of syntactic structures, more diverse and sophisticated lexis, more indices of local and global cohesion than they did when writing on paper. This is not surprising since advanced learners write more frequently, perhaps on the computer, than do less advanced ones.

Overall, insights in the present study reveal those observed by Maycock and Green (2005): candidates were more at ease in the computer-based mode and chose to do their tasks in CM group since computer familiarity had made them interested and confident enough. Also, candidates generally graded their computer and typing abilities as firm and outstanding in the CFQ (Q14). This is harmonious with the usually high levels of computer familiarity witnessed amongst the subjects as a whole.

CONCLUSION

The main conclusion of the present study are presented here and briefly touched upon. The first conclusion is that the students in CM group outperformed those in the PM group which could be a result of the attention they pay to work in computer mode and the concern about their handwriting and ease of navigation. It seems that being ad adult who is a little familiar with computer makes confident writers who are not concerned about editing, moving sentences, focusing more efficiently, and managing their writing that led to higher adherence to topic. This study revealed that computer familiarity influenced students' performance in the CM group positively. The students in the CM group were satisfied with the computer-mode test. Also, their familiarity and proficiency level worked hand in hand which led to their outperformance.

In terms of the test-taker experience, the main conclusion is that computer-based writing was clearly preferred by CM participants, which is especially noticeable at the higher levels of English proficiency. This indicates an intention towards a shift in writing on screen as the norm, and handwriting is increasingly getting an unusual format, particularly in the composition of formal and long pieces of writings; consequently, the continuance of research on the mode of writing test delivery is unavoidable.

It is concluded that that the mode of IELTS writing test delivery mode per se might present construct-irrelevant variances and differences into the scores. The type of the mode (i.e. computer-based & paper-based) would affect the performance of the IELTS candidates' writing tasks 1 & 2. The results of this study may raise important questions for the examination providers (i.e. the British Council, Cambridge ESOL and IDP Australia). The IELTS test developers conduct detailed research and analysis of test material and test takers' performance to ensure that not only does IELTS provide accurate information for the institutions that recognize it, but that the tests are fair to test-takers whatever their nationality, first language and gender (Green, 2007; Hawkey, 2006; Saville, 2009).

This study also provides essential information for Cambridge ESOL Research and Validation Group who undertake impact studies of IELTS as an integral part of the ongoing monitoring, validation and evaluation of the IELTS test (Hawkey, 2006; Saville, 2009). The research findings can help this body understand and consider improving language teaching, learning, methods, materials, and activities.

References

Asiyaban, A. R., Yamini, M., Bagheri, M. S., &Yarmohammadi, L. (2020). Implicit/explicit knowledge and its contribution towards tense consistency employment across EFL learners' proficiency levels. *Cogent Education*, *7*(1), 1727129.

Alves, R. A., Castro, S. L., de Sousa, L., & Stromqvist, S. (2007). Influence of typing skill on pause-execution cycles in written composition. In M. Torrance, L. van Waes, & D. Galbraith (Eds.). Writing and cognition: Research and applications (pp. 55–65). Amsterdam: Elsevier.

Barkaoui, K. (2016). What and when second-language learners revise when responding to timed writing tasks on the computer: The roles of task type, second language proficiency, and keyboarding skills. Mod. *Lang. Rev. 100*(1), 320–340.

Barkaoui, K., &Knouzi, I. (2018). The effects of writing mode and computer ability on L2 test-takers' essay characteristics and scores.*Assessing Writing*, *36*, 19-31.

Blackhurst, A. (2005). Listening: Reading and writing on computer-based and paper-based versions of IELTS. *Research Notes, 21*, 14–17.

Breland, H., Lee, Y., &Muraki, E. (2004). Comparability of TOEFL CBT writing prompts: Response mode analyses (TOEFL research report No. RR-75) Princeton, NJ: ETS.

Chambers, L. (2008). Computer-based and paper-based writing assessment: A comparative text analysis. *Research Notes, 34*, 9–15.

Chan, S., Bax, S., & Weir, C. (2017). Researching participants taking IELTS Academic Writing Task 2 (AWT2) in paper mode and in computer mode in terms of score equivalence, cognitive validity and other factors.

Chapelle, C. A., & Douglas, D. (2006). *Assessing language through computer technology*. Ernst KlettSprachen.

Clariana, R., & Wallace, P. (2002). Paper–based versus computer–based assessment: key factors associated with the test mode effect. *British Journal of Educational Technology*, *33*(5), 593-602.

Davies, A. (2007). Assessing academic English language proficiency: 40+ years of U.K. language tests.

Fox, J., Bayliss, D., & Wesche, M. (2007). *Language testing reconsidered* (p.

192). University of Ottawa Press/Les Presses de l'Université d'Ottawa.

Douglas, D., &Hegelheimer, V. (2007). Assessing language using computer technology. *Annual Review of Applied Linguistics, 27*, 115–132.

Green, T., &Maycock, L. (2004). Computer-based IELTS and paper-based versions of IELTS. *Research Notes, 18*, 3–6.

Fulcher, G. (2014). Philosophy and language testing. In A. J. Kunnan (Ed.), *The companion to language testing* (pp. 1431–1451). Hoboken: Wiley.

Horkay, N., Bennett, R. E., Allen, N., Kaplan, B., & Yan, F. (2006). Does it matter if I take my writing test on computer? An empirical study of mode effects in NAEP. *Journal of Technology, Learning and Assessment, 5*(2), Retrieved from: www.jtla.org.

IELTS. (2014). Guide for educational institutions, governments, professional bodies and commercial organizations. Retrieved from https //www. ielts. Org//media/publications/guide-for-institutions/ielts-guide-for-institutions-uk.ashx?la=en

Jin, Y., & Yan, M. (2017). Computer literacy and the construct validity of a high-stakes computer-based writing assessment. *Language Assessment Quarterly*, 1–19.

Lee, Y. J. (2002). A comparison of composing processes and written products in timed-essay tests across paper-and-pencil and computer modes. *Assessing Writing*, *8*(2), 135-157.

Li, J. (2006). The mediation of technology in ESL writing and its implications for writing assessment. *Assessing Writing, 11*(1), 5-21.

Lottridge, S., Nicewander, A., Schulz, M. &Mitzel, H. (2008). Comparability of Paper-based and Computer-based Tests: A Review of the Methodology. Pacific Metrics Corporation 585 Cannery Row, Suite 201 Monterey, California 93940.

Maycock, L. O. U. I. S. E., & Green, T. O. N. Y. (2005). The effects on performance of computer familiarity and attitudes towards CB IELTS. *Research Notes, 20*, 3-8.

Najmi, K. (2015). The effect of genre-based approach on enhancing writing skill of Iranian law students. *Modern Journal of Language Teaching Methods, 5*(2), 474.

Neuman, G., &Baydoun, R. (1998). Computerization of paper-and-pencil tests: When are they equivalent? *Applied Psychological Measurement, 22*(1), 71-83.

O'Loughlin, K. (2011). The interpretation and use of proficiency test scores in university selection: How valid and ethical are they? *Language Assessment Quarterly, 8*(2), 146-160.

Parsi, P., &VahdaniSanavi, R. (2015). The effects of dynamic assessment on improving writing ability of intermediate EFL learners. *International Journal of Language*

Learning and Applied Linguistics World, 8 (2), 73-88.

Poggio, J., Glasnapp, D., Yang, X. &Poggio, A. (2005). A Comparative Evaluation of Score Results from Computerised and Paper & Pencil Mathematics Testing in a Large-Scale State Assessment Program. *The Journal of Technology, Learning and Assessment*, 3(6), 5-30.

Puspawati, I. (2012). EFL/ESL (English as a Foreign/Second Language) Students' Perceptions toward the TOEFL (Test of English as a Foreign Language) Test.

Quaid, E. D. (2018). Reviewing the IELTS speaking test in East Asia: Theoretical andpractice-based insights. *Language Testing in Asia*, *8*(2), 25-48.

Russell, M., & Haney, W. (1997). Testing writing on computers: An experiment comparing student performance on tests conducted via computer and via paper-and-pencil. Education Policy Analysis Archives, 5(3), Retrieved from:http://epaa.asu.edu/epaa/v5n3.html.

Shohamy, E. G. (2001). *The power of tests: A critical perspective on the uses of language tests*. Pearson Education.

Torrance, M., & Galbraith, D. (2006). The processing demands of writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.). Handbook of writing research (pp. 67–80). New York: Guilford Press.

Uysal, H. H. (2010). A critical review of the IELTS writing test.*ELT journal*, *64*(3), 314-320.

Van Waes, L., &Schellens, P. J. (2003). Writing profiles: The effect of the writing mode on pausing and revision patterns of experienced writers. *Journal of pragmatics*, *35*(6), 829-853.

Weir C J, O'Sullivan B (2017) 'Assessing English on the global stage: the British Council and English language testing, 1941-2016', in (ed(s).)., edn, London: Equinox.

Weir, C. Y. R. I. L., & Shaw, S. T. U. A. R. T. (2005). Establishing the validity of Cambridge ESOL writing tests: towards the implementation of a socio-cognitive model for test validation. *University of Cambridge ESOL Examinations Research Notes*, *21*, 10-14.

Weir, C., Yan, J., O'Sullivan, B., &Bax, S. (2007). Does the computer make a difference? The reaction of candidates to a computer-based versus a traditional hand-written form of the IELTS Writing component: effects and impact. *International English Language Testing System (IELTS) Research Reports 2007: Volume 7*, 1.

Weir, C. J., O'Sullivan, B., & Jin, Y. (2007). Does the computer make a difference? The reaction of test-takers to a computer-based versus a traditional hand-written form of the IELTS writing component: Effects and impact. IELTS Research Report No.7British Council & IDPAustralia311–347.

Wolfe, E. W., &Manalo, J. R. (2005). An Investigation of the Impact of Composition Medium on the Quality of TOEFL Writing Scores. TOEFL® Research Report.RR-72.ETS RR-04-29.*ETS Research Report Series*.

Wolfe, E. W., Bolton, S., Feltovich, B., &Niday, D. M. (1996). The influence of student experience with word processors on the quality of essays written for a direct writing assessment. *Assessing Writing, 3*, 123–147.

Yurdabakan, I. (2012). Primary School Students' Attitudes Towards Computer Based testing and Assessment in Turkey. *Turkish Online Journal of Distance Education- 13* (12), 177-188.

Biodata

Mehdi Dastpak is a PhD candidate of TEFL at Islamic Azad University, Shiraz Branch, Iran. His research areas include IELTS, TOEFL, curriculum development, language teaching and testing.
Email: md_dataforse@yahoo.com

Dr Mohammad Javad Riasati is an assistant professor of applied linguistics at Islamic Azad University, Shiraz Branch. He has published several papers and presented papers at international conferences. He also taught various English courses in different language schools and universities. His areas of interest include assessment, IELTS speaking, and psycholinguistics.
Email: mjriasati2002@yahoo.com

Dr Ehsan Hadipourfard is an assistant professor of applied linguistics at Islamic Azad University, Shiraz Branch. His areas of research are technology-assisted language learning, assessment, and computer-assisted language learning.
Email: e.ehadipor@gmail.com