Dynamic Assessment: A Diagnostic Tool to Capture Academic Second Language Reading Difficulties in the IELTS Context

Sima Poulaki[1], Hamidreza Dowlatabadi*[2], Moussa Ahmadian[3],
Hoshang Yazdani[4]

[1]Ph.D. Candidate, Department of English Language, Faculty of Humanities, Arak University, Arak, Iran, *s-poulaki@phd.araku.ac.ir*

[2*]Assistant Professor, Department of Foreign Languages, Arak University, Arak, Iran, *h-dowlatabadi@phd.araku.ac.ir*

[3] Associate Professor, Department of Foreign Languages, Arak University, Arak, Iran, *m-ahmadian @phd.araku.ac.ir*

[4] Assistant Professor, Department of Foreign Languages, Arak University, Arak, Iran, *h-yazdani @phd.araku.ac.ir*

Abstract

This study aimed to illuminate the diagnostic potential of the *interactionist dynamic assessment (DA)* to identify the candidates' academic reading difficulties on the *IELTS Reading* test. Furthermore, DA and its interactive environment seem to provide an opportunity to diagnose the possible linguistic and cognitive roots of the academic *second language (SL)* reading difficulties that the *modest user* IELTS candidates faced. In so doing, three participants whose scores in the academic IELTS reading sub-score were 5/5on a scale of 1-9 participated in this study. The data were collected through observation and interaction based on DA principals through 36 individualized sessions (12 sessions for each participant). In each session, they were assigned to answer 13-14 academic reading comprehension questions independently, and then the mediator and the learners collaboratively reviewed the questions answered in the first stage. The feedback types offered deliberately ranged from very implicit to very explicit. The interactions were video recorded, transcribed word-by-word, and investigated. The findings indicated participants' difficulties in locating specific information, interpretation of words or phrases in the text, understanding the key ideas in a paragraph level, inference making, and interpretation of the writer's intention and viewpoint. From a diagnostic perspective, it is recommended that the interactionist DA could be used as an independent or complementary diagnostic tool to diagnose academic reading difficulties and their linguistic and cognitive roots.

Keywords: Diagnostic Potential, IELTS Reading, Inferencing, DA, Reading Difficulties

1. Introduction

Dynamic assessment (DA) is defined as "an interactive alternative type of assessment that integrates assessment and instruction" (Anton, 2012, p.106). Despite its various definitions in the literature, DA is an interactive approach that emphasizes the ability of the learner to respond to intervention. Indeed, the assessors' active intervention, along with the assessment of test-takers' response to intervention, is of importance in DA definitions (Haywood & Lidz, 2007).

As Sternberg and Grigorenko (2002) point out, dynamic and, non-dynamic approaches to assessment have three fundamental methodological differences. The emphasis of non-DA is on *matured abilities* while the focus of DA is on the future by discerning and nurturing *emergent abilities*. Moreover, in non-DA examiners have a neutral role, whereas in DA, examiners intervene in assessment and integrate it with teaching. Finally, in non-DA, no feedback is provided until the end of the assessment session, but in DA, learners receive qualitative feedback during the assessment.

In recent years, the *interactionist* versus *interventionist* paradigm has proposed in DA studies (Lantolf & Poehner, 2004). Interventionists follow test-intervention-retest format and mainly focus on quantitative results, at the same time, interactionists lay more emphasis on qualitative analysis and interpretation of the significant features of the interaction, integrating assessment with learning. Furthermore, in the interactionist approach, mediation is flexible and negotiated in learner-mediator dialog while in the interventionist approach, mediation prompts are pre-scripted and arranged as a continuum from implicit to explicit (Davin, 2013; Poehner & Lantolf, 2013).

It is worth mentioning that the majority of second language DA studies have adopted the interactionist-oriented in a one-on-one format (Ableeva, 2010; Poehner, 2008). However, the interventionist DA has been examined mainly in classroom settings (Lantolf & Poehner, 2011). Although interventionist approaches may be more appropriate when applied to large groups, an interactionist approach may be more useful in a classroom situation (Anton 2012).

Ableeva (2010) contends that mediator-learner interaction based on DA principles not only helps the learners to go beyond the level of performance and experience cognitive development, but it also seems to have the diagnostic potential to reveal the source of learners' problematic areas. Likewise, Antón (2009) pinpoints the agentive role of the assessor/examiner in the interaction as an essential factor in diagnosing the students' linguistic ability.

The word diagnosis in language teaching and learning is sometimes called the interface between assessment and learning (Alderson, 2005). "The goals of diagnostic language assessment are to make diagnostic inferences about learners' strengths and weaknesses in skills of interest and to utilize them for positive changes in learning" (Jang, 2012, p. 121).

Until recently, however, as Alderson, Haapakangas, Huhta, Nieminen, and Ullakonoja (2015) point out the SL researchers less focused on answering questions of "how, what, and why SFL teachers diagnosed their learners' problems," as well as what are "the nature and causes of their strengths and weaknesses" (p.1). They argue that the diagnosis of SL problems in two so-called "productive skills"; writing or speaking is not as difficult as the so-called "receptive skills"; reading and listening. This is partly because the learners' problems in productive skills are more "obvious". Conversely, receptive skills are much less amenable to inspection and research because they are "typically internal" (p.3) to the learner/reader/listener.

Needless to say, reading is one of the most important skills in the field of education. The disproportionate number of research in L1 reading in comparison to that of SL reading reveals that researchers apply L1 reading theories to SL studies. The 1980s, however, is a turning point in SL reading research because at that time, SL reading became "a discipline in its own right (Alderson et al., 2015, p. 70).

The research on SL reading reveals that the transfer of L1 reading problems and learners' background knowledge are two undeniable factors in SL scrutiny. However, SL researchers should take into account that firstly, many L1 reading problems transfer to SL reading (Sparks, Paton, Ganschow, Humbach, & Javorsky, 2008), but not all do transfer (Alderson, et al., 2015). Secondly, although the role of background knowledge on SL reading comprehension has been researched extensively (Jang 2005), findings from research into the learners' reading problems from the same language background should not be readily generalized to all readers because SL reading problems vary across different L1 backgrounds, (Alderson et al. 2015).

In SL reading, there is very little research into the diagnosis of reading problems; thereby, the nature of SL reading problems is not well understood, nor is a diagnostic procedure well documented or researched. Addressing the issue, this study describes the design and implementation of a diagnostic SL assessment to identify learners' difficulties in the *International English Language Testing System (IELTS)* academic reading by focusing on their process of reading. Thus the study utilizes dynamic assessment whereby

the examiner/ assessor mediates reactively in response to on-going challenges that readers face. To achieve the purpose of the study, theses research questions were addressed:

1. What is the diagnostic potential of the interactionist DA deployed by the IELTS instructor to identify the candidates' academic reading performance on the IELTS Reading Test?

2. What are the possible linguistic roots of the academic SL reading difficulties that the modest user IELTS candidates faced?

3. What are the possible cognitive roots of the academic SL reading difficulties that the modest user IELTS candidates faced?

2. Literature Review

In what follows, key DA studies in SL are reported. Campione and Brown (1990) introduce the *graduated prompt approach* to DA. In this approach, mediation is provided during one single test administration and it relies on the use of *prompts* or *hints* in testing context from the most implicit to the most explicit ones.

Targeting on improving the oral narrative ability of undergraduate learners of French, Poehner (2005) reported the application of interactionist DA on oral proficiency of advanced L2 learners of French. Poehner (2005) asked them to watch a short video clip and then make a past-tense narrative in French. During the pre-test, no mediation or feedback was offered. After that, the teacher attempted to mediate the learners' performance by providing hints/prompts or by asking leading questions. Although none of the learners was completely mastered the task (using French past-tense in narration), their performance reflected signs of improvement. After six-week tutoring through which the learner's performance was mediated, they were asked to watch the same video clip and repeat the same oral task along with two other transfer tasks so as to investigate how the learners perform in new contexts. In this investigation, in addition to learners' development, Poehner asserted that DA-based mediated interaction could depict a revealing picture of learners' difficulties.

Anton (2003, 2009) implemented a diagnostic DA to place Spanish university students at a proper L2 level. In these studies, the students were asked to write about the given topic in 20 minutes independently. After the writing task, they were allowed to revise the task employing dictionaries or asking the examiners for help. For assessing speaking ability, the learners first narrated a picture story, then the examiner gave them proper hints to improve their performance, in the final stage, the learners narrated the story

again. By investigating the results of a dynamic procedure, Anton (2003, 2009) identified the learners who required extra help.

To address the current lack of diagnostic assessment in language instruction, Ableeva (2010) focused on the application of dynamic assessment to the development of the learners' listening ability. To this end, she recruited intermediate university students studying French as a foreign language and compared the results of using DA and a traditional test of listening comprehension. The findings of her study indicated that, through interactions in the ZPD, DA could assess not only the actual level of the participants' listening ability, but it also evaluates the potential level of their listening development.

In addition to develop the learners' skills, applying DA in general and interactionist DA in particular would help diagnose the learners' source of problems related to SL abilities. Rahimi, Kushki & Nassaji (2015) implemented an interactionist DA procedure to diagnose the learners' difficulties in conceptual L2 writing and scrutinize their development. The three participants were assigned to write on 10 topics independently. Then all written texts were revised in learner/assessor collaborative sessions to diagnose the major source of learners' difficulties.

For fresh insights into SL reading comprehension, Yang and Qian (2017) initiated the project to investigate the influence of *computerized dynamic assessment(C-DA)* in assessing Chinese learners' ability in reading comprehension of English texts. In the first phase of the study, they attempted to diagnose the major reading difficulties by asking 52 participants to answer five multiple-choice reading comprehension questions. Along with choosing the correct answer, they were also asked to write the thinking process to complete the reading task. The researchers diagnosed three main difficulties participants faced while answering the reading comprehension test items, including the difficulty caused by new words in the text, the difficulty in locating specific sentences in the text based on the clues provided in the test items, and poor inferencing ability. They also concluded that C-DA has better diagnostic potential and enables researchers to delve into learners' reading difficulties. Moreover, participants in this study gave positive feedback on the constructive effects of C-DA on their performance.

To date, almost all research done in reading assessment exploited multiple-choice question format, which is entirely in line with the tendency for "objectivity for discriminating among test takers" in the traditional reading assessment (Jang, 2005, p. 13). What is noteworthy is that Alderson (2000) considers the use of multiple methods to assess the understanding of a reading passage as an "interesting" feature of the IELTS Academic reading

test mainly because in real life, readers usually respond to reading texts in different ways (p. 206).

Bearing in mind Alderson's (2000) point, it can be predictable that IELTS, thanks to its various task types, attracts the attention of researchers in SL reading assessment. Moore, Morton & Price (2007) represented a comprehensive overview of the IELTS reading test and compared reading requirements of the IELTS with those of academic study. Their framework encompasses two main dimensions including the level of engagement with the text and the type of engagement. The level of engagement is an index to clarify how much of a text (or texts) needs to be read to engage with the target reading task. The type of engagement determines the way (ways) of dealing with the text (or texts) of reading for responding to a prescribed task. Moore, Morton & Price (2007) selected a continuum-based approach for presenting these two criteria. While the former ranges from more *local* to more *global* engagement, the latter covers a continuum from more *literal* to more *interpretative* engagement.

One of the strengths of the IELTS academic reading test lies in its capacity to exploit multiple methods of assessing academic reading ability. This point encouraged the researchers to use the IELTS reading comprehension tests/tasks rather than other proficiency tests that mostly employ multiple-choice question format. Since a product-oriented approach towards reading may not help researchers to scrutinize reading comprehension processes, and given the potential problems that may hinder comprehension, this study employs a process-oriented approach towards the test takers' performance with the aim of shedding more light on diagnosing reading difficulties.

In this probe, *interactionist DA* has been used as a diagnostic tool. In fact, investigation of the assessor-learner dialogues recorded over individualized sessions based on DA principles helped the researchers to diagnose SL reading comprehension difficulties and, more distinctively, their possible linguistic and cognitive roots.

3. Method

3.1. Participants

For the purpose of this study, three IELTS candidates were selected. The selection of the participants was guided by the information/guidelines available in the IELTS reports (Jang, 2019). Accordingly, those candidates whose scores on the academic IELTS reading section reaches 5/5 on a scale of 1-9 are regarded as *modest users.* The participants were among 18 the Mock IELTS participants whose performance on two successive tests

administered within a two-week interval showed maximum variability on the four test parts (listening, reading, speaking, and writing). An upcoming deadline of about 5 months posed by the urge to sit an actual IELTS and get a minimum overall score of 6.5 comprising an academic reading score of 6 or higher motivated them to participate.

Demographics indicated that among the participants there were 2 females and 1 male. Participant 1 was a 29-year-old male, BS holder in Software Engineering and Participant 2 was a 33- year-old female, MA holder in MBA, and Participant 3 was a 25 year-old female, BA holder in Architecture. They had all taken IELTS preparation classes already at three different Language Institutes in Iran and were quite familiar with the genre.

3.2. Materials and Instruments

3.2.1. Observation

In this study, one of the researchers who is also a mediator/assessor closely observed the participants' independent performance in all 36 sessions. A camera was positioned on a tripod to show the participants' performance while answering the tests independently and the Software AnyDesk 5.3.2 Win/Mac/Linux was used to monitor the video camera recording on the laptop simultaneously.

The video-observed sessions were scheduled in such a way as to provide a holistic view of the learners' strategic decisions (e.g. circling and underlining), the time needed to answer a specific number of test items, pauses (long or short), and manipulation of test item orders while answering test items independently.

3.2.2. Tutor's Journal

In this study, in order to have a better understanding of the learners' problems, the IELTS tutors attempted to maintain a detailed journal during the video-observed stage of participants' independent performance to be considered in assessor/ learner interactions based on DA principles and later in content analysis of all scripted data.

3.2.3. The Cambridge IELTS Academic Reading Tests 11, 12, 13

To assess the academic English reading required for academic study or professional recognition, samples of the actual IELTS Reading test published by Cambridge University were used. One academic IELTS reading actual test includes three sub-sections, each organized around a separate reading passage. The IELTS reading passages (on average 750 words in length) adopted from a wide range of sources such as magazines, journals, books, and newspapers with the general academic topics for a non-specialist

audience. Each reading passage is accompanied by some different reading tasks. These tasks are classified by IELTS (1996) as "(a) multiple choice, (b) short answer questions, (c) sentence completion, (d) notes/summary /diagram/flow chart/table completion, (e) choosing from a heading bank for identified paragraphs/sections of text, (f) identification of writer's view/attitudes/claims, (g) classification, (h) matching lists, and (i) matching phrases" (as cited in Moore, Morton & Price, 2007).

3.3. Procedure

The DA intervention consists of 12 weekly one-to-one tutorial sessions attended by the IELTS tutor meeting individual learners. Each tutorial lasted about 90 minutes and was video-recorded.

Data were collected in two stages. In the first stage, the learner was asked to read one reading passage and answer 13-14 reading comprehension questions/items. As mentioned earlier, participants answered the actual IELTS reading test without any test manipulation or modification. However, in each session, only one passage of a complete IELTS academic reading test was selected in the actual test administration, and all question items were answered. This stage lasted 30-35 minutes. To minimize the chances of readers' distraction and maintain the candidates' focus on the task, his/her performance in response to the test items was monitored through the application of camera.

Video-observing enabled the researcher to help learners remaining focused during reading tasks, a camera was positioned on a tripod and the researcher, sat at a distance from the candidate, received the live video feed on a monitor. This *seating* arrangement allowed for the researcher's note-taking while carefully scrutinizing the candidates' moves, avoiding unwanted disruptions to the flow of reading, and minimizing outside interruptions.

The time that each learner spent answering each set of questions was recorded too. In this stage, the candidates were not halted during the reading task by the researcher. The first stage aimed to strictly observe the learner's actual independent performance without any external support. Readers' performances were assessed in terms of the frequency of their backtracking over the reading passage, and the type of strategies they implemented while attempting each test item. Meanwhile, the readers' use of underlining, circling, note-taking, and hovering the pencil over the lines of the reading passage, among other strategies, was traced by the researcher.

After a ten-minute break, the second stage began. During the second stage, DA based treatment continued with the mediator, and the learners collaboratively reviewed the questions answered in the first stage.

Meanwhile, the mediator sought about the readers' justifications for their responses regardless of the (un)acceptability of the answers. Whenever the tutor was not convinced by the readers' justifications, she offered corrective feedback dialogic interaction corresponding to the problem/ misconception detected in the readers' comments.

The feedback types offered deliberately ranged from very implicit to very explicit, following the guidelines suggested by Aljaafreh and Lantolf (1994) for systematic progression of feedback, which is sensitive to the observed signs of learner's developing self-control and autonomous response.

To have a better grasp of the readers' cognitive processes, their interactions with the tutor were held in Persian, the learners' and assessor's shared native language. All the interactions were transcribed word by word and translated into English.

3.4. Data Analysis

In this qualitative study, the data collected in 12 individualized sessions (36 sessions in total). Analyzing the data was done in successive phases. In phase one, researchers, through video observation and writing a journal, attempted to identify some salient points in learners' performances that possibly bring about reading difficulties and need to be investigated deeply. But diagnosing the reading difficulties as well as scrutinizing their roots are main targets of phase two in which mediational interactions between the assessor/ mediator based on DA principles occurred. By re-reading the scripts of video-recorded documents and tutor's journals and through content analysis, researchers diagnose main difficulties of the participants along with some possible linguistic and cognitive roots of each problem.

Since the focus of the present study was on the diagnostic potential of DA to reveal reading difficulties for academic IELTS reading candidates, the sample episodes were predominantly allocated to this phase.

4. Results and Discussion

4.1. Diagnosing the Main Difficulties in the IELTS Academic Reading

The first research question concerned the capacity of interactionist DA as a diagnostic tool to explore the learners' problems with academic reading comprehension. To this end, the learners' independent performance without any external support was closely monitored. Furthermore, mediator/researcher dialogic episodes and feedback moves were investigated. Initial analyses revealed that the participants have five main problems in answering academic reading questions. Relevant episodes are presented and

analyzed in what follows. For each of the participants, we have presented diagnostic episodes.

The content analysis of video-recording scripts of interactonist DA sessions and the tutor's journals over 36 individualized sessions help the researchers to diagnose participants' difficulties in (1) locating specific information, (2) interpretation of words or phrases within the text, (3) understanding the key ideas in a paragraph level (4), inference making, and (5)interpretation of the writer's intention and viewpoint.

It is worth mentioning that for more clarification of each diagnosed problem, the relevant part(s) of the original text, the question item(s) as well as the dialogic interaction of mediator and participant are represented in order. Moreover, highlighting or underlining some parts of the text is a hint for participants, and therefore, it is purposeful.

4.1.1 Problem1: Locating Specific Information

Locating the relevant sentence(s) in the original text from the information provided in the question is a primary skill in the IELTS academic reading context. Following the recommendations proposed by most IELTS tutors, learners mainly rely on selecting keywords in each question item then scan the original text to find them.

The Case of Participant 1

Participant 1 initially had a problem with locating the sentence(s) relevant to the question item. By close monitoring through the installed camera, the researchers noticed that he usually circled two words as keywords and constantly searched through texts to find both. If he failed to do so, he would start scanning over again, reread the prompt, and kept referring back to the text. Therefore, he had to spend time more than the average time approximately determined for each question item. Noticing such a point in the observation stage, the mediator started presenting the hint on finding key word(s).

Extract1: (True/False/Not Given Question)
Relevant material from Cambridge English IELTS Academic 11

Developed most probably as defense against forest fires, the bark of the cork oak has a particular cellular structure-with about 40 million cells per cubic centimeter-that technology has never succeeded in replacing.

(p.16)

Q: "Scientists have developed a synthetic cork with the same cellular structures the natural cork" (p.18).

Episode (1): Diagnostic role of DA (M = mediator)

1. M: *what are you searching?*

2. P1: *my keywords: scientists and synthetic, but I cannot find them.*

3. M: *please read the whole statement again, bear in mind the key idea and search for keywords.*

In re-reading, she circled cellular as well and searched

4. P1: *here it is. Particular Cellular structure*

5. M: *very Good*

6. P1: *but what about a synthetic cork? It is not here.*

7. M: *no problem something that can be reproduced is a parallel expression for syntactic*

The case of Participant 2

Extract 2: (Sentence Completion Question)

Relevant material from Cambridge English IELTS Academic 11

Although the system would consume energy, it would return energy to the grid via methane generation from composing non-edible parts of the plants. It would also dramatically reduce fossil fuels use, by cutting out the need for tractors, ploughs and shipping.

(p.19)

Question: "The consumption of ....would be cut because agricultural vehicles would be unnecessary" (p.20).

Episode (2)

8. M: *What is the answer?*

9. S3: *I cannot find the location of the answer?*

10. M: *what are you searching?*

11. S3: *agriculture, eh... and also its synonyms like Farming, planting, cultivating, etc. I can't find it, so the answer is Not Given.*

12. M: *pay attention to the highlighted part.*

13. S3: *oh,... A Tractor is a kind of agricultural vehicle.so ... the answer is True*

14. M: *Excellent.*

The Case of Participant 3

Extract 3: (Sentence Completion)

Relevant material from Cambridge English IELTS Academic 12

Another motive for collecting is the desire to find something special, or a particular example of the collected item, such as a rare really recording by a particular singer. Some may spend their whole lives in **a hunt** for this. Psychologically, this can give a purpose to a life that otherwise feels **aimless.**

(p: 20)

Question1: "Collecting something involves a lifelong ------------for a special item".

Question 2: "Searching for something particular may prevent people from feeling their life is completely ------------" (p.22).

For answering this question, the researcher noticed that she scanned to the end of the text, failed to find the words in her mind; she would start scanning over again, re-read the prompt, and kept referring back to the text.

Episode (3)

15. M: What are you searching?

16. P3: I am looking for searching, prevent, completely, … but …

17. M: once more read the question and consider the idea

18. P3: searching stops them to think life is totally …, it can be an adjective for life.

19. M: right

20. P3: started to scan,…, I don't know

21. M: please read the highlighted part bearing in mind the key idea and try to find the missing part of a statement.

22. P3: a purpose

23. M: you told me it must be an adjective for life.

24. P3: I don't know

25. M: read the underlined part

26. P3: aimless

27. M: right

   Investigation of the test-takers' performances revealed that if the exact words, phrases, or words in the same word family (e.g. different parts of speech of a word) were used in both the question items and the original text, locating specific information in a text is a relatively straightforward task. The process gets somewhat difficult when synonyms of the keyword are used, or when there is a synecdochic relationship between the word(s) in a question item and those in the original text. In this study, participant 1 failed to locate the relevant information because she did not know that 'syntactic' and 'can be produced' are more or less synonymous (line 7), while participant 2 did not notice that the writer had used the verbs 'tractors' and 'ploughs' as examples of 'agricultural vehicles' (line 13).

   In these cases, the possibility of locating on the relevant sentences relied heavily on the learners' lexical knowledge, a higher degree of attention, and the awareness of such possibility. More importantly, on occasions, the readers should go beyond the word level and understand the key idea in the question item. In the case of participant 3, for instance, since the statement in the question is the paraphrased sentence of the original text, locating information is not easy to achieve unless the test taker grasps the key idea of the sentence (line 21).

4.1.2. Problem 2: Interpretation of Words or Phrases in the text

The Case of Participant 1

Extract 4: T/F/Not Given Question

Relevant material from Cambridge English IELTS Academic 11

It's still early days for the field of neuroaesthetics - and these studies are probably only a taste of what is to come. It would, however, be foolish to reduce art appreciation to a set of scientific laws.

(p.50)

Question:" Scientists should seek to define the precise rules which govern people's reactions to works of art" (p.53).

Episode (4)

28. P1: the answer is Not Given.

29. M: did you find art appreciation?

30. **P1**: *yes, here it is. Reduce art appreciation to set of scientific law, but here in the question is 'precise rules'. They are not the same. So it is Not Given.*

31. **M**: *Do not overthink the answer and do not worry about small differences in meaning.*

The Case of Participant2

Extract 5: T/F/Not Given Question

Relevant material from Cambridge English IELTS Academic 11

At present, throughout the world, over 80% of the land that is suitable for raising crops is in use. Historically, some 15% of that has been laid waste by poor management practices. What can be done to ensure enough food for the world's population to live on?

(p.18)

Question: "Human beings are responsible for some of the destruction to food producing land" (p.20).

Episode (5)

32. **P2**: *the answer is Not Given*

33. **M**: *No. Try again*

34. **P2**: *it is the end of paragraph 1. Some 15%, then waste, and here crops instead of food- producing.*

35. **M**: *yes. These sentences are entirely relevant to the question. Please read the highlighted sentence again.*

36. **P2**: *but it doesn't mention that humans are responsible. Maybe they are, perhaps they aren't. I don't know why it is not 'not Given'?*

37. **M**: *What is your idea about poor 'management practices'?*

38. **P2**: *you mean it is the responsibility of human beings?*

39. **M**: *Yes, and the answer?*

40. **P2**: *it is true. It is very challenging.*

The Case of Participant 3

Extract 6: T/F/Not Given Question

Relevant material from Cambridge English IELTS Academic 13

It could be argued that New Zealand is not a typical destination. New Zealand is a small country with a visitor economy composed mainly of small businesses. ... Because of the long-haul flight, most visitors stay for longer (average 20 days) and want to see as much of the country as possible on what is often seen as a once-in-a-lifetime visit.

(p.17)

Question: "Many visitors feel it is unlikely that they will return to New Zealand after their visit" (p.19).

Episode (6)

41. P3: *the answer is F*

42. M: *could you tell me where did you find the answer?*

43. P3: *here it is the last 4 lines.*

44. M: *right*

45. P3: *here, the writer said 'once- in -a –lifetime', which means unique and great, so a person wants to return to visit.*

46. M: *can you tell me which part of the sentence said to you that the experience would be repeated.*

47. P3: *nothing mentioned explicitly. I think because it is exciting they will repeat. You mean the answer is 'Not Given'?*

48. M: *please read the highlighted sentence and interpret 'once- in -a – lifetime' within a sentence.*

49. P3: *I don't know*

50. M: *was it a long journey?*

51. P3: *yes. Long flight, stay 20 days. So ... it means they only travel once?*

52. M: *Yes. Therefore they are unlikely to return.*

53. P3: *yes. So it is true.*

As represented in participant-mediator interactions, incorrect or different interpretation of the words or phrases used by the writer is another

problem diagnosed in test-takers' performances. Interestingly, on occasions, the test takers overthink interpretation of words' and phrases' meaning mainly because they faced the dilemma of considering the general academic meaning of the word or the more technical one. As a case in point, participant 1, who is an engineer, in response to the mediator's idea that '*precise rules*' and '*scientific laws*' are parallel explained how '*rules*' and '*laws*' are technically different.

The second example also illustrates how the test taker did not consider '*management practice*' as '*something that humans are responsible for*'. Consequently, she failed to find the correct answer. The third example disclosed how the test taker could not answer the question correctly because from one hand, she did not know the denotative meaning of '*once-in-a-life-time*' and on the other hand, despite the mediator's help, she could not benefit from the context to grasp the meaning of the phrase.

4.1.3. Problem3: Understanding the Key Ideas in a Paragraph Level

The Case of Participant 3

For answering the questions that address identifying key ides, reading the entire paragraph was essential. This learner read the whole paragraph and immediately started re-reading. The more she read, the more sing of disappointment appeared on her face. After a long wait, no answer suggested. The situation was vividly more demanding, where the paragraph was partially lengthy.

Episode (7)

54. M: *What is the answer?*

55. P2: *I do not know.*

56. M: *you can choose two or three options that are close to the main idea of the paragraph.*

57. P2: *I have no idea*

58. M: *please read the highlighted sentences*

59. P2: *I cannot choose. I know almost all words, but I cannot understand what it is mainly about. I have read it word by word but…*

Over 36 individualized sessions, it was noticed that finding key ideas in paragraph level is the most demanding task. Like an example presented here, most of the time the test takers mentioned that they knew most of the words or even most of the sentences but when they wanted to choose the best

title for the paragraph, the heading or the key points, they completely puzzled and even when the mediator asked them to say the heart of the matter of a given paragraph in Farsi (the test taker's native language), they mostly expressed that their mind was totally blank.

4.1.4. Problem 4: Inference Making

The Case of Participant 1

Extract 7: Multiple Choice Questions
Relevant material from Cambridge English IELTS Academic 11

Thus, for example, the actor Humphrey Bogart is the character Sam Spade; film personality and life personality seem to merge.
(p.91)

Question: "One reason that the writer refers to Humphrey Bogart is to exemplify

A. the importance of the actor and the character appearing to have similar personalities.

B. the audience's wish that actors are visually appropriate for their roles

C. the value of the actor having had similar feelings to the character

D. the audience's preference for dialogue to be as authentic as possible"

(p.93)

Episode (8)

60. **P1**: *C is right*

61. **M**: *did you find Humphrey Bogart?*

62. **P1**: *yes it is here paragraph 2. Film personality and life personality seem to merge.*

63. **M**: *yes,*

64. **P**: *it means they have similar feelings, so C is correct*

65. **M**: *seem to merge. Is it something that happens or people think it is true.*

66. **P1**: *think to be true.*

67. **M:** *yes.*

68. **P1**: *please wait,... B and D are wrong, but ... A. yes A is correct. 'Appearing to have' ... yes A*

The Case of Participant 2

Extract 8: Heading Matching Questions
Relevant material from Cambridge English IELTS Academic11

Modern science - linguistic, archaeological and genetic evidence - has definitively proved the moai builders were Polynesians, but not how they moved their creations. Local folklore maintains that the statues walked, while researchers have tended to assume the ancestors dragged the statues somehow, using ropes and logs.

(P.46)

List of Headings
i.   An undisputed answer to a question about the moa
vi.   Two opposing views about the Rapanui people
(p.45)

Note: it consists of 10 headings, but these two are the subject of debates between the learner and the mediator

Episode (9)

69. **P2:** *the answer is vi. Here it is, they definitely proved … ,but not how…*

70. **M:** *please once again read the heading.*
71. **P2:** *there are two points about them.*
72. **M***: are they opposing views*
73. **P2:** *I am a little confused. What does it mean by 'opposing views'?*
74. **M***: for example, some people say something others take the opposite view.*
75. **P2***: No. they are not.*
76. **M:** *please read the highlighted part.*
77. **P2***: say something for sure.*
78. **M***: excellent*
79. **P2***: the correct answer is i*

Inferencing is also difficult because a reader should grasp the meaning which is not mentioned explicitly. It was witnessed that in some cases, asking some questions to demand the attention of the test takers can be helpful mostly in cases that are focusing on the meaning of a word or a phrase clarifies the hidden meaning. The case of participant 2 (primarily in line 71) indicates that she noticed the sentence structure that indicates a contrast (X but Y) and immediately chose '*two opposing ideas'* as the correct answer. Although such conclusion can be regarded as a sign of development, the test taker failed to discriminate that these two points were not conflicting.

4.1.5. Problem 5: Interpretation of the Writer's Intention and Viewpoint

The Case of Participant 3

Extract 9: Multiple Choice Questions

Relevant material from Cambridge English IELTS Academic11

Synchronous sounds contribute to the realism of film and also help to create a particular atmosphere. For example, the 'click' of a door being opened may simply serve to convince the audience that the image portrayed is real, and the audience may only subconsciously note the expected sound. However, if the click of opening door is part of an ominous action such as burglary, the sound mixer may call attention to the 'click' with an increase in volume; this helps to engage the audience in the moment of suspense.

(p. 92)

Question: "The writer refers to the 'click' of a door to make the point that realistic sounds

        A. are often used to give the audience a false impression of events in the film

        B .may be interpreted in different ways by different members of the audience

        C. may be modified in order to manipulate the audience's response to the film

        D .tend to be more significant in films presenting realistic situations"

(p. 93)

Episode (10)

80. P3: It is very easy. The correct answer is D.
81. M: did you find the 'click' in the text?

82. P3: yes. Here it is. Contribute to the realism of the film. Here is the realistic situation.

83. M: please read the highlighted part.

84. P3: D is not correct.

85. M; No. read the underlined part

86. P3: I don't know

87. M: They want to convince the audience that the situation is real; it is not necessarily real. Please once again read option A, B, and C

88. P3: *A. Give a false impression*

89. M: *No. read option C. can you tell me the meaning?*

90. P3: *realistic sounds may change to x the reaction of the audience to the film.*

She did not know the meaning of manipulate

91. M: *manipulating means to control something to your advantage. Here in the tex, an increase in volume.*

92. P3: *you mean C is right?*

93. M: *what's your idea?*

94. P3: *it is confusing.*

Interpretation of the writer's opinion and viewpoint was difficult because the test takers not only should inference the meaning of the relevant sentences, but they should go further and deduce why the writer mentioned a phrase or (a) sentence(s). It was noted that the test takers found it very difficult even when the hints were presented on the meaning of the words or even, on occasions, after translating the sentences to the test takers' native language. In the given example, the participant did not approve that the mediator is right and with no sign of approval, she mentioned that it was confusing for her (line 94).

4.2. Discussion: Diagnosing the Possible Linguistic and, or Cognitive Roots of Reading Difficulties

This study attempts to employ interactionist DA as a diagnostic tool to probe the test-takers' main reading difficulties in the IELTS context as well as scrutinize the possible linguistic and cognitive roots of detected problems. For presenting the linguistic and cognitive roots of difficulties, researchers prefer to present them on a continuum that ranges from mainly linguistic to linguistic-cognitive and, mainly cognitive roots. To this end, the IELTS tutor's journals and the scripts of video-recorded sessions underwent close content analysis by researchers.

It was noticed that poor vocabulary knowledge plays an important role in virtually all diagnosed difficulties. According to research, "*Vocabulary knowledge entails several different but related aspects*" (Read 2000; Nation 2001 cited in Alderson et al. 2015, p.101) and knowing the meaning of a word is only one dimension thereof. In other words, vocabulary knowledge not only includes "*the words' conceptual meaning*", it

encompasses their "*associations and relations with other words such as synonyms [and] antonyms*" (Alderson et al. 2015, p.101). The cases of participants 1 and 2 (problem 1) revealed how poor lexical knowledge, more precisely, the word associations and relations with other words, hindered them from locating specific information in the original text.

A limited paraphrasing skill that is directly related to lexical knowledge has also been recognized as another key factor that impeded the test takers. Paraphrasing or using a range of different languages for the same meaning is so crucial since IELTS is very big on paraphrasing. Some test-takers who are poor in paraphrasing encountered difficulties, in answering reading comprehension questions. In the case of participant 3, finding the exact location of the answer (problem1) in the original text heavily relied on understanding the key idea of the question statement because in the text, the paraphrased sentence has been used.

Word comprehension, in other words, understanding the meaning of the words in context, is a pivotal factor that facilitates interpretation of the words or phrases selected by the writer. Viewing vocabulary as knowledge of single words is a simplification of reality. Alderson et al. (2015) indicate that vocabulary knowledge also encompasses 'use-related' aspects including (a) "*collocational knowledge*" which refers to knowing which words are typically used alongside each other, (b) "*knowledge about different registers*," which refers to the contexts in which a given word is used correctly, and (c) "*formulaic expressions*" or word combinations whose meaning is different from that of each component word and which require their own suitable context to make sense (p.102).

Hence, poor vocabulary knowledge (with such thorough definition) was recognized as a significant factor that hindered correct and contextualized interpretation of the words or phrases used in the text. The case participant 2 (problem 2) reflected how poor lexical knowledge negatively influenced her interpretation of the word's meaning. His explanation (line 37) pinpoints that the test taker disregarded the implied meaning of '*management practices*' as a kind of merely '*human*' activity.

Furthermore, considering the context in which the words or phrases interprets is of paramount importance. The case of participant 1 (problem 2) suggests that the test-taker interprets the meaning of words as he might do in technical texts, disregarding the possibility that IELTS reading texts are general academic texts rather than technical ones.

In a similar vein, Read (2000) notifies that "word recognition" and "word comprehension" are different. While the former is a very "decontextualized" task, the latter is entirely "contextualized" in which

learners have to show their understanding of the words presented to them in some textual contexts ranging from a sentence to a whole text (p.102). The case of participant 3 (problem 2) indicates that the test taker, from one hand, did not know the denotative meaning of the phrase *once-in-a-life-time, on the other hand,* overlooked the context clues to interpret the meaning of the key phrase.

In the IELTS context, for answering some question types (e.g., heading matching, matching statement(s) with a paragraph), it is essential to comprehend key ideas at a paragraph level "by connecting, integrating, or summarizing information across sentences". To this end, "Recognizing the organizational structure of a text and the ability to identify main ideas from supporting details are required for effective summarizing" (Jang, 2019, p.34).

In scrutinizing the participants' problems while they had to read and comprehend the part of the text in *super-sentential level* (a whole paragraph for instance), the learners mainly mentioned that (1) they did not understand the key ideas because of the difficult words and structures of the text, (2) they knew the meaning of the words and even understood the sentences but they did not comprehend what the paragraph was about, and (3) they admitted that they understood the text but as they read further they had forgotten what they had already read. Admittedly, when the paragraphs were lengthy, the problem was undisputable.

To analyze the possible roots of such difficulty (problem3), three main factors should be taken into account; (1) two-level cognitive processing while reading, (2) the functions and capacity of *working memory*, and (3) the speed of reading.

Reading in the view of Alderson et al. (2015) encompasses *cognitive processes* on two levels. The *lower level* has to do with "mechanical reading" comprising "word recognition" or recognizing "symbol-sound correspondences" as well as "decoding" or the conversion of letters or symbols strings into words while the *higher-level* processes result in *comprehension* which involves discerning both the explicit ideas expressed in the text and those that demand inferencing (p.128).

Inadequate knowledge of vocabulary and grammar or *lexicogrammatical knowledge* (Alderson et al. 2015, p.102) may impede higher-level cognitive processing and hamper comprehension. In order to grasp the key ideas of a paragraph, the lexicogrammatical knowledge that benefits to understand the cohesion of paragraph mainly cohesive devices is of importance. Alderson & Kremmel (2013) declare that lexicogrammatical

knowledge together with knowledge of collocations and formulaic phrases influence SL reading ability.

Moreover, working memory as the temporary information storage and manipulation (Baddeley, 2003) plays a pivotal role as Alderson et al. (2015) indicate in "all reading processes, but in comprehension it is essential". Since working memory does not have unlimited capacity, it is crucial that the "lower-level processes of reading such as decoding and word recognition, in general, are automatic and fluent (p.132). Furthermore, the role of working memory is probably more significant in second language learning because as Alderson et al. (2015) pinpoint words and structures are less familiar. Moreover, meanings and morphology governing rules are less strongly embedded in memory. Therefore, L2 reading, like other L2 skills, involves "dual-language involvement" in each operation (p.133). Poor vocabulary knowledge that causes encountering many unfamiliar words and phrases in the text can take up much cognitive capacity and thus slow down text processing (Bowey, 2005; Perfetti et al., 2005).

The third noteworthy factor is reading speed. Marilyn Adams's (1990) cognitive model can clarify the blurred picture of the relationship between the reading speed and reading comprehension. His model which is "the most influential cognitive model" of reading compared with others showed that during reading four processors are actively involved including *orthographic processor* which is responsible for receiving information from print, *phonological processor*, as its name indicates, is responsible for receiving information from sounds or speech, *meaning processor* is responsible for determining what the information means and *context processor* that determines how the information relates to context (Bell & McCallum, 2016, p.46).

It is worth mentioning that reciprocal communication exists as Bell & McCallum (2016) note *between* and *among* the various processors and the "activity of each of the processors influences the others and is influenced by the others". To understand the productivity of the system, it is important to consider not only the elements working in isolation but a number of processors working both *simultaneously* and *sequentially* during the act of reading. Based on such findings, the most *efficient readers* are those who read quickly and with accuracy. In other words, "slow and confluent" readers are more likely to have "weaker comprehension" in comparison to more fluent readers (p.47).
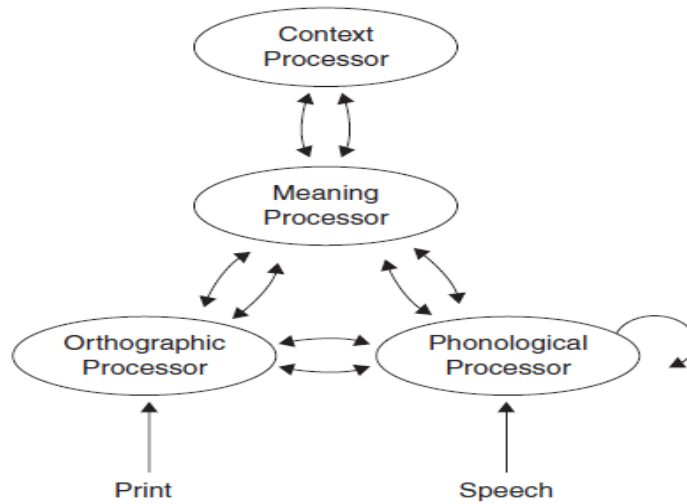
Figure 1: Adams' Cognitive Model of Reading. Adams, M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press (as reprinted in Bell & McCallum, 2016, p.47).

When an individual reads slowly, the connections among the processors are not efficiently or thoroughly activated. This results in limited meaning- making, or comprehension. Carver's (1997, 2000) research confirms that the level of understanding is closely related to the speed of reading. He indicates that the range of reading speed is from *100 words per minute* (wpm) up to *500 or 600*(wpm) or even higher. The purpose of reading and the nature of the text are two decisive factors in reading speed (as cited in Alderson et al., 2015).

In this study, it was recognized that although slow reading occurs due to poor lexicogrammatical knowledge, there is the myth that for a complete understanding of the written text, the readers must read every word. It is undeniable that based on the purpose and genre of the written material, the readers require to read word-by-word, such as in proof-reading. Even for answering reading comprehension questions, the test taker may have to read some phrases or parts of the sentence slowly and meticulously but not the whole paragraph.

Observing some test-takers' performance while reading the text clarifies a tendency of some readers for reading slowly to grasp the meaning of the text. Such tendency may stem from their experiences with teachers who have rewarded them to read the written materials verbatim.

After identifying the problem of word-by-word reading (in almost all parts of the text) mediator provided an additional copy of reading texts which

were highlighted the *chunks* as semantically and structurally distinct units constructed by the writer (Tanaka, 2006). Although changing habits is demanding and time-consuming, the mediator encouraged slow readers to read chunk-by-chunk rather than word-by-word. It was noticeable that when a paragraph contains many less frequent/technical/abstract words', chunking does not have a significant impact on understanding the summary or core idea of a given paragraph. Contrastingly, when it comes to understanding a paragraph with more familiar/non-technical/concrete words, chunking indeed appeared helpful.

In this study, the case participant 3 in understanding the main idea of a paragraph revealed how a person may know most of the words and phrases in a paragraph level without perceiving the whole message. In this case, after some sessions of chunking practice the test taker performed much better.

Difficulty in inferencing (problem 4) and interpretation of the writer's opinion and viewpoint (problem 5) were complicated to scrutinize and most importantly demanding to tackle. The readers' background knowledge related to the text and task as well as working memory (its functions, capacity, a possible impairments) are two salient factors.

Inference making (readers' connection of their background knowledge to what is read) is regarded as a pivotal component of skilled reading (e.g., Graesser, Singer, & Trabasso, 1994; van den Broek, 1994; Urmston, Raquel, & Tsang, 2013; Grabe, 2010). In other words, in inferencing the readers synthesize textual information through connecting textual information to background knowledge. Based on the schema theory, background knowledge classifies into "formal schemata" which are related to "background knowledge of rhetorical organization across different text genres" and "content schemata" which are linked to "the knowledge of textual content" (Jang, 2009, p.104). Therefore, readers' background knowledge which is used *consciously* and *unconsciously* is highly important.

The readers, in fact, activate a wide range of background knowledge from long-term memory and when texts and tasks do not fit with existing background knowledge inference making becomes difficult (Alderson et al., 2015).

Engle (2007) highlights that working memory is better understood as a part of cognition rather than as a part of memory (cited in Juffs & Harrington (2011). According to the idea of two-level cognitive processing expressed earlier, comprehending the idea conveys in the text whether explicitly or implicitly as well as connecting the text to the background knowledge or inference making occur in higher-level processes. In the view of Alderson et al. (2015), the higher level processes are not efficient if the

lower level processes do not function well and do not become more or less automatic. The "efficient use of lower level reading processes involve readers' phonological awareness, fast word retrieval skills, and working memory capacity"(p.12).

Since working memory capacity is limited, it is of importance that the lower-level processes of reading such as decoding and word recognition in general become automatic and fluent. High number of unfamiliar words as well as rules that are weakly embedded in memory can take up much cognitive capacity and thus slow down or even hinder higher-level processes (Bowey, 2005; Perfetti et al., 2005).

As a result, successful and fast reading in SL requires at least a partial automatization of lower-level processes in order to free up space for higher-level processes in working memory. Walter (2004) argue that for less proficient readers, creating a whole picture of the text, inference making, and monitoring comprehension are not fully happened mainly due to lack of working memory capacity remained for such processes. Perfetti et al., (2005) compare the performance of less skilled with skilled L1 readers. They conclude that the former group of readers has problems in processing syntax and morphology in reading in spite of their similar linguistic knowledge to that of good readers. According to such comparison, it becomes clear that "impairments in working memory itself may explain problems in comprehension" (Paris & Hamilton, 2009 as cited in Alderson et al., 2015, p. 132).

The case participant 1 (problem 4) disclosed that the linguistic difficulty of the text made inferencing extremely demanding for him. As mediator presented hints on the words' meaning, the test taker answered the question. In contrast, participant 2 (problem 4) and participant 3 (problem 5) did not have difficulties with words and sentence structures but the processing in higher cognitive level hampered.

5. Conclusion and Implications

This case study sought to investigate the common reading difficulties of IELTS candidates who are considered as the *modest user* and scrutinize the possible linguistic and cognitive roots of those difficulties using interactionist DA. More precisely, the focus was on how applying interactionist DA would help diagnose (a) the learners' source of problems related to L2 academic reading ability in the IELTS context and (b) the linguistic and cognitive roots of those problems.

The findings of this research, as far as the first research goal was concerned, clearly demonstrated the diagnostic capacity of DA in general and interactionist DA in particular. In fact, DA mainly interactionist DA offers deep insights into learners' abilities that were not easily gained from assessing a candidates' independent performance. Since the hints/prompts in interactionist DA are not planned in advanced and the researcher should be sensitive to learner's responsivity to decide what kind of help is needed to offer, this approach is an effective means of understanding learners' problems. From this diagnostic perspective, the findings of this study are significantly in line with Poehner (2005), Anton (2003, 2009), Albeeva (2010), and Rahimi, et al., (2015).

By qualitative evaluation of mediator-learner interactions during several individualized sessions based on interactionist DA principles, the five major difficulties that hinder the participants' ability to comprehend texts and answer reading comprehension questions in the academic IELTS were revealed. In this study, the most common difficulties that participants encountered were locating specific information, interpretation of words or phrases in the text, understanding key ideas in a paragraph level, inference making, and interpretation of the writer's intention and viewpoint. Two major difficulties in reading comprehension recognized in this study including difficulty in identifying specific information and poor inferencing are similar to the findings of research done by Yang& Qian, (2017).

In order to answer the second research question, the researchers scrutinized how application of interactionist DA approach can be helpful in recognizing the mainly linguistic roots of the problems in academic reading comprehension. This study also attempted to investigate the cognitive roots of the participants' difficulties to address the third research question. Although all three participants had problems understanding the main ideas of a paragraph, for instance, the reasons are completely different. For one of the participants, poor lexicogrammatical knowledge was found to be the main source of difficulty, and the most effective hint for her to identify the problem was to provide synonym(s) and definition(s) of the problem words. For another participant, slow reading was identified as the hindrance; in this case, encouraging her to read fast and chunk-by-chunk rather than word-by-word was found to be most helpful.

In brief, the findings of the present study point to (1) lexicogrammatical knowledge, or more importantly, knowledge of word associations and relations, collocations, and formulaic expressions; (2) the function, capacity, and impairments of working memory; (3) the learners'

background and/or knowledge of the world; and (4) reading speed as the key factors in reading comprehension, or weakness therein, in academic contexts.

Although providing hints based on DA principles does contribute to the participants' development, the chief goal of this research is less about tracking development than providing an in-depth analysis of the most common problem areas in academic reading comprehension. Thus, it is the researchers' intention to help the participants realize their difficulties, identify the source thereof, and ultimately, become able to address their problems and exhibit better performance in the future.

Kunnan and Jang (2009) argue that the ultimate goal of diagnostic assessment is evaluating the processes behind the test-takers performances while responding to the test items/tasks. As a result, it is of paramount importance to offer test-takers meaningful feedback in addition to the total test scores or even sub-scores so as to improve the learner development.

The implications for teachers also are awareness of the possible difficulties as well as the roots of the problems that can help teachers to take them into account while designing their tutorial sessions. The findings of this study can provide a check-list for teachers to easily find the strengths and weaknesses of the learners and the roots of difficulties for more efficient remedial sessions.

Knowing, for example, how important it is to read fast thanks to scientific clarification of Adame's cognitive model (1990) can lead the teachers to be more cautious about the importance of recording the learners time for reading a passage. Based on the finding of this study teachers are advised to lay emphasis on chunking and help their learners to work on it.

Implementing DA framework can help the teachers to discern the sources of difficulties for those learners with weaker performance and provide optimal and accurate help. Since the importance of background knowledge is irrefutable, having extensive reading of academic texts is of importance and teachers can guild the learners to choose proper texts.

Encouraging the learner to read the text chunk by chunk rather than word by word, can be helpful to improve the reading fluency since chunking is one of the major components involved (Schwanenflugel, et al., 2004).The benefits of chunking in reading comprehension are increasing processing speed (Ellis, 2003; Yubune, 2012) and improving reading comprehension (Ellis, 2001).

Investigation of the result of chunking on improving reading comprehension needs a thorough investigation. Although over 9 sessions

(because we started to work on chunking from the 3th session) the speed of reading of learners was slightly improving (based on researcher's observation and the learners' feedback), because the aim of this study and small number of participants in this study it is not possible to generalize the findings.

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