

## Medical Students' Comprehension Problems in Reading English Medical Texts

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### Abstract

A profound understanding of the students' reading comprehension process is crucial to effectively address the most urgent problems in an academic reading instruction context. This article reports findings of a study investigating Universitas Kristen Krida Wacana (UKRIDA) medicine faculty students' difficulties in understanding English academic texts. Thirty students of three English proficiency levels: beginner, intermediate, and advanced read and retold two medical texts. Interview and observation data supplemented the data gathered from the retelling transcriptions. The main findings of this research suggested that students had difficulties recognizing the vocabulary and the grammatical chunks resulting in misconceptions and comprehension inaccuracies of the texts. Insights into the *threshold hypothesis* were also discussed to suggest that a minimum proficiency level in second language (L2) acquisition is necessary to allow students accessing their first language (L1) reading skills. Intermediate level of English proficiency is insufficient for the students to read medical texts with ease.

**Keywords:** *medical students, comprehension problems, reading English medical texts*

### Abstrak

Mengenal dengan baik proses membaca mahasiswa sangatlah penting agar kesulitan pemahaman bacaan akademis dapat diatasi dengan efektif dalam kelas reading. Artikel ini membahas hasil penelitian tentang masalah-masalah pemahaman bacaan akademis yang dialami oleh mahasiswa fakultas kedokteran UKRIDA. Sebanyak 30 mahasiswa berpartisipasi dalam penelitian yang menggunakan metode retelling. Mahasiswa yang terbagi dalam tiga kelompok kemampuan bahasa Inggris (dasar, madya, dan mahir) menceritakan ulang dua artikel bahasa Inggris yang mereka baca. Wawancara dan observasi juga dilakukan untuk melengkapi data yang terkumpul. Hasil utama penelitian menunjukkan mahasiswa mengalami kesulitan mengenali kosakata dan frasa bahasa Inggris sehingga menimbulkan kesalahpahaman akan bacaan. Pembahasan mengenai *threshold hypothesis* mengungkap bahwa tingkat kemahiran bahasa minimal untuk akuisisi bahasa kedua juga diperlukan agar mahasiswa dapat mengakses ketrampilan membaca dalam bahasa pertama mereka. Kemahiran bahasa Inggris madya belum cukup membantu mahasiswa kedokteran memahami artikel akademis dengan mudah.

**Kata kunci:** *mahasiswa kedokteran, masalah pemahaman, membaca bahasa Inggris*

## Introduction

Recognizing the importance of reading in academic settings, Universitas Kristen Krida Wacana (UKRIDA) has offered EAP reading as a required course at its medical faculty for the past three years. Despite the university's requirement for the increased use of English references, the students' low English proficiency level and the limited time they have to improve their reading in English skills have become central issues to address. The English proficiency test results suggested that more than 50% of the first semester students fell below the intermediate levels. This data raised the question whether the students have sufficient amount of second language (L2) knowledge to read well for their study success. Taking into account these constraints, investigations were to find ways to better tailor the EAP reading instruction at the UKRIDA Medicine Faculty.

EAP reading instruction should effectively address the most urgent problems in reading comprehension and the specific needs of students by considering their English proficiency levels. Generalization should never be made if a course is intended to meet the needs of a particular group. Recommendations must be adapted to each classroom situation.<sup>1</sup>

Examination into the specific needs of particular L2 proficiency group is therefore required for developing customized reading instruction. The study objectives are to describe the comprehension problems that medical students have when they read academic medical texts in English and to examine whether students with different levels of English proficiency have different comprehension problems.

## Method

This research approached reading comprehension problems by considering three components in a reading process: the reader, the text, and the interaction between the reader and texts.<sup>2</sup> Investigation of the readers' interaction with the texts through retell protocol analysis, interview, and observations was to find the students' comprehension problems. The main variables examined were the readers' L2 proficiency, cognitive and meta cognitive ability through their use of background knowledge and

reading strategies, awareness of comprehension problems and reading models.

The research participants were thirty first-semester students of UKRIDA Medicine Faculty. They were assessed by using TOEFL® prediction test and grouped into three levels of English proficiency: beginner, intermediate, advanced. The students read two medical texts and retold the texts in Indonesian. The retell and interview protocols served as the main source of information for identifying the students' comprehension problems. Sugirin employed a similar approach of examining the reading process by employing protocol analysis.<sup>3</sup>

To study the students' retell protocols two stages of coding were applied. The first-stage coding was to study the participants' retellings in light of the idea units found in the two texts. The results of this first-stage coding were to locate the ideas stated that signaled comprehension problems in the second-stage coding.

Examination into the interview protocols was to confirm the findings on the students' use of background knowledge and strategies to comprehend the texts and their belief of comprehension problems. Observation notes on the students' behavior and other relevant phenomena expanded the data gathered for in-depth analysis.

Data collection and analysis in qualitative research are concurrent and interdependent processes.<sup>4</sup> The data analysis started from the coding processes and continuously be adjusted until the data analysis were completed to make sense out the data as a whole. The research method employed was qualitative in nature as it involved the analysis of transcriptions.<sup>5,6</sup> The retell and interview protocols were transcribed and observation notes were integrated into the analysis to support the research findings.

Answers to the two research questions were interpretive, in which the data coding results from three data types were integrated and explained to offer insights into the identified problems. The findings in each proficiency group were compared and contrasted to find patterns of problems in each proficiency group. Analysis of each central category and pattern emerged from the data were discussed. Answers to the two research problems were then proposed.

**Results and Discussion**

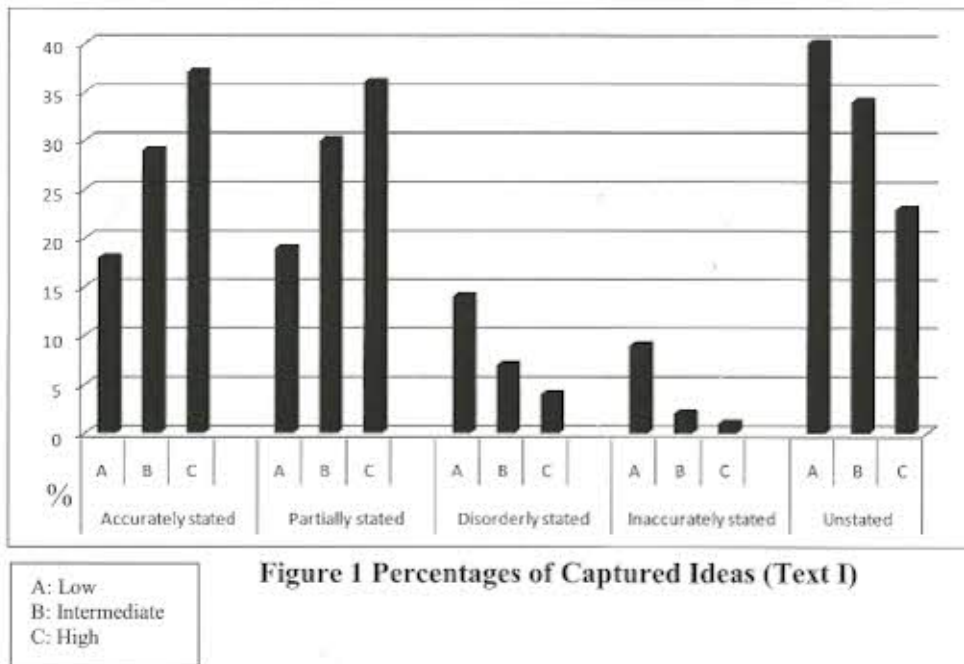
Analysis of the data and discussion of the research findings were centered at identifying the comprehension problems of medical faculty students as they read academic medical texts and the specific reading comprehension problems of the students with different levels of English proficiency. The interconnection of the research findings to the theoretical and the empirical contexts was examined.

**Extent of Comprehension Problems**

The idea units coding results were grouped according to the three English proficiency levels: Group A (Low), Group B (Intermediate), Group C (High). The percentages of captured ideas from the two reading texts described the extent of comprehension problem.

The finding on the extent of the students' comprehension problems firstly provided evidence that students did have serious comprehension problems. It was indicated by the

high percentages of the ideas partially stated, disorderly stated, inaccurately stated, and unstated. The percentages of captured ideas as shown in figures 3.1 and 3.2 suggested at least four tentative proposals for the findings. First, the percentages of ideas captured from the text I was significantly higher than those from the text II. Students across the proficiency groups comprehended text I better than text II. Second, the large number of ideas that were partially stated and unstated in both texts implied that students tended to leave out ideas that they found difficult to comprehend. The students applied avoidance strategy in dealing with difficult ideas. Third, the students' guesses were at some point inaccurate. The inaccuracies were demonstrated in the percentages of disorderly and inaccurately stated ideas. Finally, the English proficiency levels affected the students' comprehension of text II significantly, but not of text I. Most of the students were able to demonstrate a certain level of comprehension for text I, however only high proficiency group managed to maintain similar level of comprehension between text I and text II



**Figure 1 Percentages of Captured Ideas (Text I)**

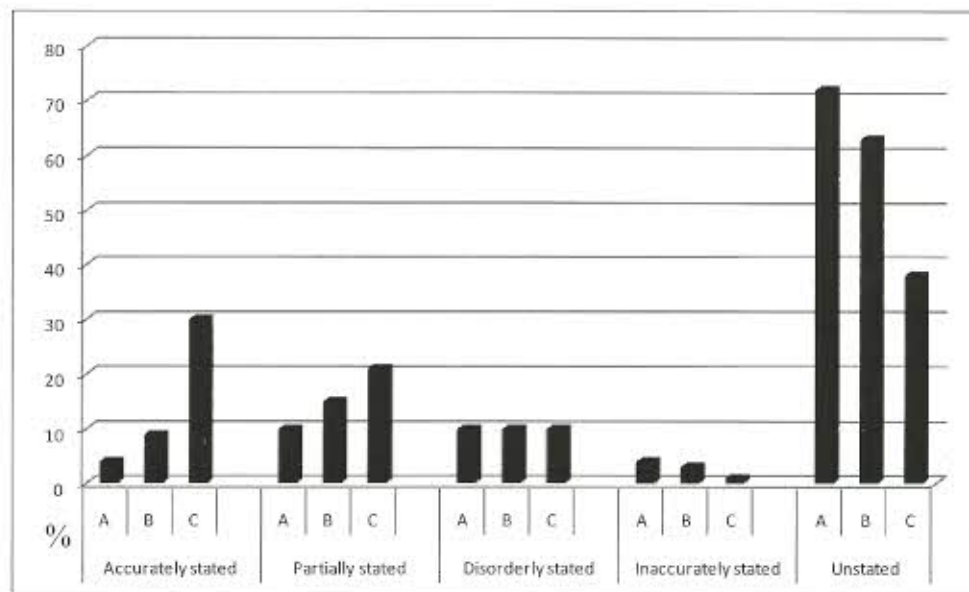


Figure 2 Percentages of Captured Ideas (Text II)

A: Low  
B: Intermediate  
C: High

**Comprehension Problems Identified**

This research found three major reading comprehension problems. Failure to cope with unfamiliar vocabulary, lack of ability to recognize complex syntax, and inappropriate utilization of prior knowledge were central issues embracing a range of reading comprehension problems identified.

Most students had significant problems decoding the general utility and content specific vocabulary labeled *mortar* and *brick* words in

this research. The vocabulary problem occurrences were more frequent than the structure problems as illustrated in Tables 3.1 and 3.2. This finding confirms the argument that vocabulary insufficiency is the main source of comprehension difficulties.

Most of partially, disorderly, and inaccurately stated ideas and interview responses indicated that students in groups A to C experienced difficulties with unfamiliar general utility word sand content specific found in texts I and II

Table 1. Number of Identified Problems in Text I

Category	Sub Category	Group		
		A	B	C
Vocabulary	General Utility	89	52	26
	Content Specific	47	53	61
<b>Total occurrences of problems with vocabulary</b>		<b>136</b>	<b>105</b>	<b>87</b>
<b>Total Vocabulary Problems</b>		<b>328</b>		
Structure	Simple Sentence	7	2	4
	Compound Sentence	2	2	-
	Complex Sentence	52	26	19
<b>Total occurrences of problems with structure</b>		<b>61</b>	<b>30</b>	<b>23</b>
<b>Total Structure Problems</b>		<b>114</b>		

Table 2 Number of Identified Problems in Text II

Category	Sub Category	Group		
		A	B	C
Vocabulary	General Utility	37	26	21
	Content Specific	65	43	36
<b>Total occurrences of problems with vocabulary</b>		<b>102</b>	<b>69</b>	<b>57</b>
<b>Total Vocabulary Problems</b>		<b>229</b>		
Structure	Simple Sentence	8	8	5
	Compound Sentence	10	10	10
	Complex Sentence	34	56	31
<b>Total occurrences of problems with structure</b>		<b>52</b>	<b>66</b>	<b>46</b>
<b>Total Structure Problems</b>		<b>164</b>		

Observations into the sentences that hold the most inaccuracies suggest general utility vocabulary that often led to comprehension difficulties included single words such as "mild", "moderate", "imbalances", "include", "increase", "overexcite", "succumbing", "prevent", "adjacent", "raised", "damage", and "surrounding". In addition, content specific vocabulary such as "electrolyte", "diuretic", "total peripheral resistance", "clot", "rupture", "brain tissue", "neurons", "glutamate", "drug", "side effects", "neurotoxic release", "neuronal

loss", and "bind with" also resulted in inaccuracies. Other types of words often resulted in comprehension difficulties were morphologically complex words such as "antihypertensive medication", "unintentional" and phrasal verbs like "keep off", "protect against", and "bind with".

One example is the students' difficulty with general utility vocabulary words: "mild" and "moderate" as shown in the following text I citation

Text I.3.7: Patients with *mild* hypertension arbitrarily defined as a diastolic blood pressure between 90 and 100 mm Hg...

Text I.5.13: The preponderance of evidence in the literature suggest that *moderate* aerobic exercise performed for 15 to 60 minutes three times per week is a beneficial therapy in most cases of *mild* to *moderate* hypertension.

The words "mild" and "moderate" occurred more than once in the first text, suggesting the significance of those two adjectives. The text underlines that moderate aerobic exercise benefits patients with mild hypertension. It implies that other cases of hypertension, such as severe hypertension requires different treatment. Students however interpreted those two words incorrectly. A8 experienced difficulty to decode the meaning of "mild" and "moderate". Her unfamiliarity with the word "mild" was apparent when she pronounced it "mill" and read the word "moderate" "moderator" as shown below.

A8: [...] tapi itu- er terapi yang...  
menguntungkan- in most k- er case of

*mill to moderate hypertension- it is wise ((membaca dari teks)) -(12)- duh ((tertawa))[...]but- er therapy which... benefits- in most er case of mill to moderate hypertension- it is wise ((reading from texts)) -(12)- arrgh ((laughing))*

B3 interpreted the meaning of "mild" incorrectly, as he referred to "mild hypertension" as "severe hypertension". Although he admitted that he had learned about the normal diastolic and systolic blood pressures, he was unable to use his knowledge to interpret the meaning of "mild".

B3: naïf disini-hipertensi itu ada...bisa dibagi-disini ada **mild** hipertensi yang

**maksudn** yaitu...hipertensi yang cukup **serius**-[...] (*and here-hypertension consists of... is divided into- mild hypertension- which means... severe hypertension- [...]*)

B2 interpreted the word "moderate" as "modern". Inaccurate interpretation of the word "moderate" also occurred in the high proficiency group (Group C) as revealed in the excerpt of C2 retellings. He interpreted "moderate exercise" as "effective exercise".

B2: ada literatur yang mensugestimm dengan- (3) - olah raga aerobik- yang- **modern** yang-**regular**(*there was literature which .... mm with- modern aerobic exercise that is- regular*)

C2: **olah raga- yang efektif** itu- dengan- eraerobik- dan 3 kali seminggu- er 15 sampai 60 menit per week nya (2) (*effective- exercise- with- er aerobic- and three times per week- er 15 to 60 minutes per week*)

A closer examination into the data gathered suggests at least two key factors responsible for the failure in coping satisfactorily with the unfamiliar vocabulary. These key factors concerned with the limited vocabulary recognition strategies, lack of effort to cope with the difficulties, use of single reading model to approach the text, and inability to activate prior knowledge.

Another problem significantly affected the students' reading comprehension was their limited abilities to recognize English syntax, especially complex sentence structure that usually characterizes academic texts. The students' difficulty to make sense of the complex syntax concerned with their inability to make appropriate chunking of the embedded clauses.

The students made inappropriate chunking in their retelling, resulting in some missing information or inaccuracies as illustrated in the excerpt of text I below.

Text I.1.1: **When blood pressure is up**, one way to bring it down is to **increase the level of physical activity**.

A4: jadi **ketika darah naik** itukan- **menambah**... ini... erlevelaktivitasfisiknya... (*so when blood pressure is up- it increases... er the level of physical exercise*)

A4 did not recognize the main clause of the sentence and made incorrect chunking by mistaking adverb clause for main clause and missing the verb "is." She stated the sentence ambiguously when she left out the main clause "one way to bring it down is." There was no cohesion between the ideas she stated: "When blood pressure is up," and "to increase the level of physical activity." The incorrect chunking has

resulted in inaccurate understanding that the increased blood pressure had increased the level of physical activities.

Another problem with chunking multiple clauses that the students encountered was identified in the retelling of text I sentence 6. Excerpts of B2 and C5 illustrate the inaccurate chunking.

Text I.2.6: **The side effects of drugs that manipulate total peripheral resistance include** increased blood triglyceride levels, lower HDL cholesterol levels (the "good" form of cholesterol), weight gain, sexual dysfunction, and depression.

B2: **efek samping dari obat- itu- memanipulasi – total keseluruhan- restitensi-peripheral- yaitu-** mmpeningkatan-trigli- trigli- tri-gliseridadarah- [...] (*the side effect of the drug-*

*manipulates the total peripheral resistance- that is mm increasing- tri- trigli- blood tri-glyceride-[...]*

- C5: **erefek samping- obat-obatanni- juga bisa memanipulasi zat-zat yang ada di dalam darah seperti menaikkan- er level trigliserid dalam darah- (the side effect of this drugs- can also manipulate the substances in the blood such as increasing- er the blood triglyceride level)**

B2 and C5 made incorrect chunking of the complex sentence that involved adjective clause. Similar to A4, they failed to recognize the main clause of the sentence 6 and mistook the predicate of the adjective clause for the predicate of the main clause. Difficulties to chunk multiple clauses led to problems in making sense of the ideas found in a sentence, and in larger units: paragraphs and texts.

The problem in organizing the words into chunks was likely due to two factors. Firstly, the students had insufficient ability to recognize the complex sentence structures. Secondly, many students read the texts in a word-by-word manner which hindered appropriate grouping of words into meaningful chunks.

Finally, the current study also found that prior knowledge when used inappropriately hindered the students' comprehension. Prior knowledge was not always useful in assisting comprehension if the knowledge brought to the texts were inaccurate or inappropriately utilized. The faulty preconception and the inappropriate use of prior knowledge were evident in misconceptions about term "drug" and the concept of "increasing physical exercise to reduce hypertension."

The misconceptions about the word "drug" were demonstrated by some students from the low and intermediate proficiency groups as unravelled in the excerpt of A7, A8, B1, and B3.

Text I.3.8: The risks of taking the **drugs** may outweigh the benefits gained from lowering the blood pressure.  
 Text I.3.9: Because of the **drug therapy's** possible side effects, nondrug treatment of mild hypertension may be most beneficial.

- A7: [...]**resiko orang memakai er untuk memakai drug- mm- memakai er memakai narkoba-er dapat er dapat menaikkan-(4)-er dapat er apa? Memacu untuk er untuk menurunkan tekanan darah- karena-terapi dengan narkoba-dapat- mempunyai efek er efek samping -(3)-dengan memakai treatment yang tidak er tidak narkoba-pada hipertensi yang akut-lebih-lebih-lebih bagus-lebih mempunyai tujuan([...]) risks that people have er to use drug- mm to use er to use narcotics and illegal drugs- er can er increase -(4)- er can er what is it? Increase for er for decreasing blood pressure – because- therapy using illegal drugs- can- have side effects -(3)- by using treatment that do not er that do not use narcotics and illegal drugs- on severe hypertension- more- more- better- having more objectives)**

A7 was unaware that one of *drug's* meanings is medicine. The ambiguity might be due to the word "drug" that often has negative connotation in Indonesian context. Drugs were most often referred to as illegal substance such as narcotics, marijuana or cocaine. This inaccurate interpretation resulted in a misunderstanding that "illegal drugs" could be used as a therapy for hypertension which could be very dangerous if it occurs in the real context.

The faulty preconception of the vocabulary item "drug" was also demonstrated by the excerpts of B1 and B3 below.

- B1: er ada yang ternyata tuh- **buat nurunin hipertensi itu- bisa dengan narkoba – drug gitu kan- Cuma ada efek sampingnya (er there is in fact- decreasing the hypertension- can be done through narcotics and other illegal drugs – because it'sdrug- right- but there are side effects)**

B1 misinterpreted the word "drug" or "hypertensive medication" found in idea 4 as "narkoba", which means illegal drugs. B1 inferred from the text that "antihypertensive medication" was the same as the term "drug", the meaning of which she knew was "illegal drug" or "narcotic." B3 also confirmed that he had problem understanding the term "antihypertensive medication" as he left sentence 4 unstated and referred the term "drugs" to "illegal medicine" when he stated "er drugs-mungkin ini obat- seperti narkotika mungkinya-drugs soalnya"(er drugs- may be this drug- is may be like narcotic- because (it says) drugs).

The readers' ability to use knowledge of vocabulary and syntax in their interaction with the texts represents the readers' linguistic knowledge and ability of which were lacking in this study. Another problem identified, the knowledge that the readers' bring to the texts are either inaccurate or inappropriately used. The inaccurate preconception and inappropriate use of prior knowledge can actually be avoided if readers are able to cope with the conflicting information in the texts. The success of the comprehension process is therefore contingent on the appropriate integration of the readers' prior knowledge with textual information.<sup>7,8</sup>

#### Comparison of Problems across Proficiency Levels.

Although students across the proficiency groups had similar types of comprehension problems in vocabulary recognition, English syntax, and prior knowledge use, the extent of comprehension difficulty varied. The beginner and intermediate students demonstrated similar level of vocabulary recognition difficulties. The high proficiency students showed more knowledge and uses of strategies to cope with their vocabulary difficulties. The level of difficulties that the students encountered in syntax area also varied across the proficiency levels. The chunking difficulties particularly occurred in the low and intermediate groups. The higher the proficiency level was the fewer problems with sentence structures were usually found. In light of the students' ability to employ prior knowledge, the low and intermediate proficiency groups had limited skills to activate their prior knowledge to make sense of the new information and confront the misconceptions.

Unlike the lower level groups who failed to fix their preconception, high proficiency group demonstrated readiness to accept new concepts.

This study finding is in favor of the *threshold hypothesis* which claims that a minimum proficiency level in L2 acquisition is necessary to allow learners to successfully transfer their established L1 reading skills. Many researchers consider that there is a *language threshold* or a *language competence ceiling* or second language reading abilities.<sup>9,10,11</sup> Unless learners have reached a threshold level of L2 proficiency, they would not be able to function well in academic reading context.

Even though a fixed language requirement cannot be applied in all contexts for all readers, standardized proficiency tests do reflect on the students' comprehension ability. Passing the high-level of English proficiency appeared to equip students with the necessary linguistic knowledge to tackle reading texts of various types, topics, and difficulties. Alderson identified the significant influence of L2 linguistic proficiency in which high proficiency level students demonstrate better ability to transfer their L1 reading skills than lower proficiency level ones.<sup>12</sup>

Although it may sound classical to suggest, a minimum score of standardized English proficiency test is required. This recommendation is the most realistic and economical way to increase the students' successful participations in higher education contexts. Some low and intermediate students might onetime be lucky to succeed in comprehending a text, but it could be only a matter of coincidence that they are familiar with the topic.

Another possible method to deal with the comprehension problems that might benefit low and intermediate levels students is the one suggested by Yamashita.<sup>13</sup> Her study finding supported the importance of acquiring high L2 proficiency to read well and suggested that L2 readers should be encouraged to use their L1 resources such as good reading strategies or other relevant prior knowledge. One way to achieve it is by motivating L2 students to read large amount of texts in both L1 and L2 to enhance their cognitive resources through reading.



## Conclusion

Students' difficulty in coping with unfamiliar vocabulary items is one central concern to address. Complex syntax commonly used in academic texts also resulted in major difficulties, such as chunking a text into smaller meaningful units. The inappropriate use of prior knowledge led to further comprehension problems.

This finding supports the claim that without the minimum English proficiency students would not be able to make use of their cognitive skills effectively.<sup>12</sup> In this research the level is equal to a minimum score of 550 based on the TOEFL prediction test. Medicine students must surpass this English proficiency requirement in order to gain satisfactory academic reading comprehension.

Three suggestions made concern with the instruction of vocabulary, complex syntax, and prior knowledge activation. For maximum results, the subject specialist instructors need to share the responsibility of increasing the students' vocabulary size. Considering the large amount of technical vocabulary that medicine students find in English textbooks, content specific vocabulary must be glossed and taught to the students as they are learning the subject. The reading classroom should also include the teaching of complex syntax. Students need practice segmenting ideas appropriately to help them understand the text. Extensive practice for the students to chunk ideas at sentence level is among the best way to expose the students with the different types of clauses used in academic reading texts. Finally, reading instruction should cover the teaching and practice of prior knowledge activation and comprehension monitoring. The fact that students have prior knowledge does not automatically enable them to use the knowledge to help them understand the text accurately. Without the skills to use prior knowledge appropriately and revise faulty preconceptions, students tend to miscomprehend the texts they read.

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