



Traces of Critical Thinking Ability in the English for Academic Purposes Textbook for the Students of Medicine

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Abstract

The current study aimed to investigate the representation of critical thinking in English for the Students of Medicine (II) and the status of the EAP students' critical thinking ability as its main users. Peterson's (2008) model was used to identify different types of critical reading questions in the textbook. Furthermore, a convenience sample of 150 students of medicine completed the 30 five-item Likert scale Critical Thinking Questionnaire (Honey, 2000). The results of scrutinizing the 2678 reading comprehension activities in light of Peterson's taxonomy revealed that a large proportion of the exercises in this textbook reflected Vocabulary in Context (1696, %63.29) and Literal Comprehension (782, %29.20) questions while Extended Reasoning (157, %5.86) questions, as the major category catering for critical reading, constituted only five percent of the whole items. The results of an independent sample t-test also indicated a moderate level of critical thinking ability among the EAP students of medicine regardless of their gender. The findings call for revisiting the English for Medical Purposes materials and incorporating more activities and exercises gearing to higher-order cognitive skills and critical thinking ability to empower the EAP students with the required set of skills to be successful in their academic and professional communities.

Keywords: Critical thinking, English for the student of medicine, extended reasoning, vocabulary in context, literal comprehension.

Introduction

English for Academic Purposes (EAP) is an indispensable part of curricula in almost all majors in Iran. In EAP courses, the students are mostly presented with English major-specific sources (Atai, 2000), mainly aimed to bridge the gap between the learners' general English reading competence and their ability to read discipline-based sources (Atai, 2002). These courses intend to provide content-specific lessons. Indeed, EAP is a context-dependent, learner-centered course (Hutchinson & Waters, 1987) whose materials are geared to the peculiarities of a given discourse community.

EAP materials and textbooks play a prominent role in leading the teachers and learners towards their specific goals and providing them with the required

support (Dudley-Evans & St. John, 1998). They pursue six major objectives namely stimulating learning, systematizing the teaching and learning process, representing the underlying theory of language and learning, echoing the nature of the tasks, widening the scope of teacher training, and presenting a model of well-suited and accurate language use (Hutchinson & Waters, 1987).

In Iran, "The Organization for Researching and Composing University Textbooks in Humanities" (SAMT) is responsible for publishing EAP textbooks which mainly focus on developing the students' reading comprehension (Rezaee, Taase, & Alishahi, 2016). However, reading comprehension is, by no means, confined to grasping the meaning at the sentence level and is no longer perceived as a receptive process of picking up information from the page in a word-by-word

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manner (Grabe, 1991). This has been accentuated in recent views which emphasize on developing the learners' problem-solving skills, that is, the ability to identify, elucidate, assess, and disentangle reading confusions. This set of skills underlie thinking critically and reading between the lines (Waters, 2006). Critical thinking encompasses the use of information, experience, and world knowledge in ways which allow for seeking alternatives, making inferences, posing questions, and solving problems, thereby signaling understanding in a variety of complex ways (Liaw, 2007).

The educational system primarily attempts to develop this skill, as an inalienable ability from the learners' personal and academic lives (Ennis, 1993). Numerous studies have paid particular attention to critical thinking in the language learning contexts (Eftekhari, Sotoudenama, & Marandi, 2016; Khatib, 2012; Nosratinia & Zaker, 2014; Talebinejad & Matou, 2012). Talebinejad and Matou (2012) found out the inclusion of questions intended to develop the students' critical thinking ability. Contrarily, Rezaee et al.'s (2016) study showed that a large proportion of activities and exercises of the EAP textbooks addressed general reading questions and extended reasoning questions as the main type representing critical thinking were less frequently presented.

Considering the reading skill in English textbooks, three types of critical reading questions were considered (Peterson, 2008) including 1) Vocabulary-in-Context (VIC) questions which assess the students' ability to provide definitions for difficult or unknown words, 2) Literal Comprehension (LC) questions which require learners to locate the response in the text, and 3) Extended Reasoning (ER) questions which ask the students "to analyze, evaluate, and pull together information from the passage(s)" and entail "finding causes/effects, making inferences, analyzing and using logical reasoning" (Peterson, 2008, p.75). The model has been used in previous studies on critical analysis of EFL reading comprehension (Talebinejad & Matou, 2012) and EAP textbooks (Rezaee et al., 2016). Furthermore, EAP textbooks published by SAMT have been evaluated in numerous studies (Baleghizadeh & Rahimi, 2011; Eslami-Rasekh, 2010; Tajeddin, 2005). Bringing the EAP textbooks for medical students into focus, Rahimy (2008) revealed a wide coverage of the reading and writing skills. In the same line, Maleki & Kazmi (2012) compared English for the Students of Medicine (II) and Medical Terminology from the instructors' and students' point of view and demonstrated both groups' preference to use Medical Terminology due to the quality of its layout, activities, and content.

Taking into account the significant role of textbooks in preparing the students to complete a wide range of discipline-specific academic tasks and the importance of building up and boosting the medical EAP students' critical thinking ability, the current study attempted to remove this void and investigate how critical thinking was represented in English for the Students of Medicine (II) textbook. The study further tried to examine the status of critical thinking among medical EAP students, as the main users of this textbook. Critical thinking is a vital skill for the medical students since they are expected to make complex judgments and manage various conflictive incidents in healthcare settings (Lie et al., 2021).

Considering the role of critical thinking in the medical education, Dehghanzadeh and Jafaraghaee (2018) compared the possible impact of traditional lecture and flipped classroom on developing Iranian nursing students' critical thinking skills and found out that actively engaging the students before, during, and after classes in the flipped mode enhanced their critical thinking. Likewise, Sahoo and Ali Mohammed (2018) investigated the influence of adopting journal critiquing approach on the medical students' critical thinking disposition and demonstrated the positive contribution of this educational approach in developing the students' higher-order thinking skills. More recently, Li et al. (2021) evaluated the medical students' critical thinking and revealed its relationship with their emotional intelligence and conflict management styles. They showed that the students' level of critical thinking predicted their control over their emotions and their ability to manage the upcoming conflicts in the workplace.

Taking prior research altogether, the study addressed the following research questions:

1. Does English for the Students of Medicine (II) reflect critical thinking?
2. Is there any significant difference among different types of critical reading questions in English for the Students of Medicine (II)?
3. What is the status of EAP medical students' critical thinking?
4. Is there any statistically significant difference between male and female medical students in terms of critical thinking?

Method

Participants

The sample consisted of 150 EAP, male (75) and female (75), students passing EAP courses at universities of medical sciences in different cities in Iran, namely

Isfahan and Tehran, adopting a convenience sampling procedure. They participated voluntarily and their age ranged from 18 to 33. To take heed of the participants' homogeneity, only those with a score higher than 15 in their General English course (the prerequisite course prior to the EAP one) were included in the sample.

Corpus

The textbook "English for the Students of Medicine (II)" authored by Mehrabi & Tahririan (2017) developed by SAMT was taken to be analyzed in light of Peterson's (2008) model. The textbook belonged to the third generation of SAMT textbooks. Having 330 pages, English for the Students of Medicine is composed of 25 lessons. Each lesson encompasses three sections namely Reading Comprehension, Further Reading, and Translation Activities. A total number of 2678 reading activities were identified in the textbooks and were categorized based on the used taxonomy.

Instruments

Critical Reading Questions: In order to analyze the reading comprehension activities in the textbook, Peterson's (2008) model were used which entails three types of critical reading questions. The first type, Vocabulary-in-Context (VIC) questions assess the learners' ability to describe hard and unknown terms and request them to define a specific word in the passage (Peterson, 2008). The second type, Literal Comprehension (LC) questions allow the learners to recognize the details that are presented explicitly in the passage. The third type, Extended Reasoning (ER) questions require the learners to analyze, evaluate, and pull together information from the passage(s) and entail finding causes/effects, making inferences analyzing and using logical reasoning (Peterson, 2008). The validity of the model was assured through eliciting the professional judgment of two experts in the field with the textbook evaluation research experience of more than five years. They were familiar with various models for analyzing the activities across numerous ELT and EAP packages. As regards the reliability of the model for analyzing the reading comprehension questions, the two researchers and another coder assigned the reading comprehension activities to the categories of Peterson's model separately and inter-coder reliability of 0.98 was obtained. The model proved to be appropriate to examine the reading comprehension activities in the literature (Rezaee et al., 2016).

Critical Thinking Questionnaire: In order to collect the required data, the Critical Thinking Questionnaire developed by Honey (2000) was used. This instrument

evaluates the paramount skills of comprehension, analysis, and evaluation and entails 30 five Likert scale items ranging from 1 (*Never*) to 5 (*Always*) assessing note-taking, summarizing, questioning, paraphrasing, researching, inferencing, discussing, classifying and outlining, comparing and contrasting, distinguishing, synthesizing, inductive and deductive reasoning abilities. The Cronbach alpha was calculated as 0.89 in this study to ensure the reliability of the questionnaire. The questionnaire was given to three experts whose area of interest and publications were related to psycholinguistics to check its validity. They confirmed the suitability of the questionnaire to measure the participants' critical thinking skills.

Procedures

The questionnaires were sent in the Google Form via WhatsApp to the participants due to the university closures resulting from the spread of COVID-19 pandemic. They were sent to the WhatsApp groups formed by the students to share their educational resources and news during global pandemic. A total of 150 fully completed questionnaires were received from the medical students in Isfahan and Tehran. Following that, based on Peterson's (2008) taxonomy of critical reading questions, 2678 reading comprehension activities of the textbook were examined and categorized by the two researchers. The reading comprehension question types were also identified by another coder who was familiar with the analytical framework and the inter-coder reliability of 0.98 was obtained. The three coders reached a consensus on areas of difference through negotiation and the type of those questions was determined before the final analysis. It is worth noting that the exercises not representing critical reading questions were considered as general reading questions (Rezaee et al., 2016).

Descriptive statistics were used to answer the first three research questions. The total number of different types of questions and percentage values throughout the book were calculated and the mean values for the participants' critical thinking ability were reported. In order to answer the second research question, a Chi-square test for goodness of fit was run. Moreover, an independent sample t-test was conducted to see if there was any significant difference between male and female students in terms of critical thinking ability.

Findings

To answer the first research question on the representation of critical thinking in English for the Student of Medicine (II), frequency and percentage values were obtained. As Table 1 displays, in this EAP

textbook, 1695 (%63.29) of the whole items in exercises and activities represented Vocabulary in Context (VIC) questions followed by Literal Comprehension (LC)

(%29.20), Extended Reasoning (ER) (%5.86), and General Reading (GR) questions (%1.65).

Table 1.

Frequency and Percentage Values of Critical Reading Questions in the Medical EAP Textbook

English for the Students of Medicine (II)	Vocabulary in Context	Literal Comprehension	Extended Reasoning	General	Total
	1696	782	157	37	2678
	63.29	29.20	5.86	1.65	100

Furthermore, to answer the second research question, a Chi-square test for goodness of fit was run. As Table 2 shows, there was a significant difference with regard to the frequency of different types of critical reading questions in the textbook ($X^2= 2.586$, $p\leq 0.05$).

Attempting to answer the third research question, Levine test ($p=0.35$, $p\geq 0.05$) was conducted to check the homogeneity of variance. The mean score of the critical thinking ability for the students of medicine was obtained as 71.44, indicating a moderate level of critical thinking ability. In this regard, the mean scores for male and female EAP students were 70.43 and 72.87, respectively (See Table 3).

To answer the fourth research question, an independent sample t-test was run. As Table 3 illustrates, no significant difference was found among the students

of medicine in terms of their critical thinking ability with regard to their gender. This might imply that EAP students of medicine need to get involved in activities and tasks gearing to higher-order cognitive skills regardless of their gender.

Table 2.

Chi-square Test for the Reflection of Critical Reading Questions in "English for the Students of Medicine (II)"

	Count
Chi-Square	2.586
Df	3
Asymp. Sig.	0.00

Table 3.

Results of Independent Samples T-Test for Male and Female EAP Students

Variable	Group	N	Mean	SD	T	df	Sig.
Critical Thinking Ability	Male	75	70.43	1.69	-0.82	148	0.41
	Female	75	72.87	2.58			

Discussion

The current study investigated the representation of critical thinking in English for the Students of Medicine (II) and the status of the EAP students' critical thinking ability as its main users. The results revealed that a large proportion of the exercises in this textbook reflected Vocabulary in Context and Literal Comprehension questions while Extended Reasoning questions, as the major category catering for critical reading, constituted only five percent of the whole items. The results of an independent sample t-test also indicated a moderate level of critical thinking ability among the EAP students of medicine regardless of their gender.

According to Hutchinson and Torres (1994), no teaching procedure is complete unless it is backed up by appropriate materials. This seems to hold true for EAP courses which aim to address discipline-specific needs of the students. In this regard, losing sight of the peculiarities of academic discourse communities and lacking high-quality content, the deficient textbooks fail to meet the EAP students' needs (Rezaee et al., 2016).

EAP courses mainly intend to develop the university students' discipline-based reading skills (Atai, 2002). Hence, the materials are developed striving to enable the students to study their specific academic reference materials (Soleimani, 2005). Disregarding the learners' needs and merely giving a strong emphasis to developing the students' knowledge of technical

vocabulary (Amiryousefi & Ketabi, 2011) as well as neglecting the critical thinking ability in EAP textbooks (Rezaee et al., 2016) would lead to the practitioners' dissatisfaction with the EAP courses.

Analyzing the representation of critical thinking in "English for the Students of Medicine (II)" demonstrated the material developers' negligence in incorporating this necessary skill since among the critical reading questions, the lowest frequency belonged to Extended Reasoning questions as the major type gearing to critical thinking ability (Peterson, 2008). In this regard, the results corroborated those of Rezaee et al. (2016) who found that Extended Reasoning questions were almost absent in EAP textbooks for the students of Veterinary Medicine, Psychology, and Civil Engineering. However, the findings were not in agreement with Talebinejad and Matou's (2012) study which revealed that critical reading questions were abundantly found in university reading comprehension textbooks. This contrast might arise from the focus on developing the subject-specific reading competency of the medical students in the EAP materials, which requires enhancing the students' knowledge of medical words and expressions. Indeed, EFL reading textbooks mainly strive to form and improve the learners' general comprehension skills and strategies (Waters, 2006).

The results also indicated a moderate level of critical thinking ability among the students of medicine. The results were in line with previously conducted studies regardless of their gender (Aliakbari & Sadeghdaghighi, 2011; Li et al., 2021; Rezaee et al., 2016). Accordingly, this might call for a more generous incorporation of critical thinking in Iranian EAP textbooks (Rezaee et al., 2016). Indeed, to have a generation of successful EAP students, promoting their problem-solving and critical thinking skills needs to be prioritized (Gardner & Jeweler, 2000). This important duty can be fulfilled by reading sections which serve as a tool for reinforcing, internalizing, and expanding EAP students' discipline-related knowledge of the language (Rivers, 1981).

Conclusion

The current study investigated the reading comprehension activities in the EAP textbook introduced in English for medical purposes courses in light of critical thinking model. Furthermore, it aimed to measure the textbook main users' level of critical thinking skills. The results revealed the lack of correspondence between the medical students' level of critical thinking ability and the proportion of activities gearing to their higher-order thinking skills. The study focused on the EAP students in universities of medical sciences and only those who voluntarily completed the

questionnaire participated in the study. The findings may raise the medical EAP course instructors' awareness to take the Reading Thinking approach in EAP classes (McNamara, 2007) to enhance EAP students' self-monitoring skills through an apprenticeship model of learning and thereby, develop the students' critical thinking skills and strategies and "compensate for the mediocre representation of critical thinking in the textbooks" (Rezaee et al., 2016, p. 56).

Furthermore, EAP instructors at universities of medical sciences are recommended to apply Peterson's (2008) model of critical thinking as a pedagogical framework to promote the students' critical thinking ability in EAP classes. In fact, the results would inform the educators of the significance of equipping the medical students with effective critical thinking skills (Li et al., 2021).

The study had some limitations. The medical students' critical thinking skills were assessed through self-report questionnaires. Future studies can apply qualitative instruments to enrich and deepen the facilitative and debilitative factors that influence their critical thinking ability. In addition, larger group of medical students can be included in the sample of future research to investigate the level of critical thinking at a larger scale. Furthermore, the current study focused on the EAP students' critical thinking ability and the representation of this set of skills in their coursebook in the field of medicine. Future studies may investigate the reflection of critical thinking in other EAP textbooks and the status of critical thinking ability among the given group of EAP students who study them. Moreover, the possible impact of taking a critical thinking approach to teaching reading on EAP students' critical ability to read technical texts can be studied.

Conflicts of Interest

No conflicts of interest declared.

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