ORIGINAL ARTICLE

The Effect of Strategy-based Instruction on Medical Students' Academic Writing Performance

Yusef Rajabi*
English Department, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran

*Islamic Azad University, Imam Khomeini Campus, Farhikhtegan Blvd., Kermanshah, 6718997551 Iran

Tel: +98 9183575185
Email:
josef.rajabi@gmail.com

Background: The present study was intended to investigate the effectiveness of strategy-based instruction in the form of self-regulatory strategy development on persuasive academic writing performance of a group of Iranian medicine and pharmacy students. Additionally, the study sought to examine if such instruction carries over to a related academic genre, i.e., descriptive writing.

Methods: First, 30 male and female medicine and pharmacy students were administered pre-tests on target genres. Secondly, they received SBI on the persuasive genre of academic writing. Thirdly, the participants were asked to write essays on a set of writing probes across these two genres. Finally, post-tests were administered.

Results: The results showed that the persuasive-specific self-regulatory strategy instruction the participants received contributed to their performance on persuasive academic writing. In the case of descriptive academic genre, the participants' performances on the posttest experienced a boost compared to those in the pretest corroborating the transfer of learning to a related non-instructed genre. More specifically, the sentences participants wrote in the posttests were longer, qualitatively better, and contained more persuasive and descriptive elements.

Conclusions: Supplementing English for academic purposes courses for the students of medicine with strategy-based instruction in the form of genre-specific self-regulatory strategy development interventions seems a necessary first step in enhancing academic writing ability of medical students. The findings out of this research have certain implications for English for academic purposes students and teachers accordingly.

Keywords: English for Academic Purposes, Medical Students, Academic Genre, Strategy-Based Instruction

تأثير التعليمات المستندة إلى الإستراتيجية على أداء الكتابة الأكادمية لطلاب الطب

الخلفية: تهدف الدراسة الحالية إلى التحقيق في فعالية التعليم القائم على الإستراتيجية في شكل تطوير إستراتيجية التنظيم الذاتي على أداء الكتابة الأكادمية المقنع لمجموعة من طلاب الطب والصيدلة الإيرانيين. بالإضافة إلى ذلك ، سعت الدراسة إلى فحص ما إذا كانت هذه التعليمات تنتقل إلى نوع أكادمي ذي صلة ، أي الكتابة الوصفية.

الطريقة: أولاً ، تم إجراء اختبارات أولية على ٣٠ طالب وطالبة في كلية الطب والصيدلة على الأنواع المستهدفة. ثانياً ، حصلوا على SBI حول النوع المقنع للكتابة الأكادمية. ثالثًا ، طُلب من المشاركين كتابة مقالات على مجموعة من مسابر الكتابة عبر هذين النوعين. أخيراً ، تم إجراء الاختبارات اللاحقة.

النتائج: ساهمت تعليمات استراتيجية التنظيم الذاتي المقنعة المحددة التي تلقاها المشاركون في أدائهم في الكتابة الأكادمية المقنعة. في حالة النوع الأكادمي الوصفي ، شهد أداء المشاركين في الاختبار البعدي دفعة قوية مقارنة بتلك الموجودة في الاختبار التمهيدي التي تدعم نقل التعلم إلى نوع ذي صلة غير تعليمي. وبشكل أكثر تحديدًا كانت الجمل التي كتبها المشاركون في الاختبارات اللاحقة أطول ، و أفضل نوعياً ، و تحتوي على عناصر أكثر إقناعاً و وصفاً.

الخلاصة: يبدو أن استكمال دورات اللغة الإنجليزية للأغراض الأكادمية لطلاب الطب بالتعليم القائم على الإستراتيجية في شكل تدخلات تطوير استراتيجية التنظيم الذاتي الخاصة بالنوع المحدد هو خطوة أولى ضرورية في تعزيز قدرة الكتابة الأكادمية لطلاب الطب. لتوسيع نطاق دراسات التعليمات القائمة على الإستراتيجية ، فإن نتائج هذا البحث لها آثار معينة على اللغة الإنجليزية للأغراض الأكادمية للطلاب و المدرسين على حد سواء.

الكلمات المفتاحية: اللغة الإنجليزية للأغراض الأكادمية ، طلاب الطب ، النوع الأكادمي ، التدريس القائم على الإستراتيجية

تأثير آموزش مبتنی بر راهبرد بر عملکرد نوشتاری آکادمیک در دانشجویان پزشکی

زمینه و هدف: پژوهش حاضر به منظور بررسی اثربخشی آموزش مبتنی بر راهکار در قالب تدوین راهکارهای خودتنظیمی بر عملکرد نوشتاری اقناعی گروهی از دانشجویان پزشکی و داروسازی ایران انجام شد. در این پژوهش سعی شده است بررسی شود که آیا این نوع از آموزش روی نگارش توصیفی به عنوان یک دسته دانشگاهی مرتبط نیز تأثیر می گذارد.

روش: در ابتدا، عملکرد نگارشی ۳۰ دانشجوی پزشکی و داروسازی زن و مرد در دسته های هدف طی پیش آزمون بررسی گردید. سپس در طول ۱۶ جلسه راهکار های خودتنظیمی در دسته نگارش اقناعی تدریس شد. در مرحله بعد، از شرکت کنندگان دعوت شد که انشاهایی درباره موضوعات مشخصی در دو دسته اقناعی و توصیفی بنویسند. در پس آزمون، عملکرد نگارشی شرکت کنندگان در چهارچوب دسته های گفته شده مورد بررسی قرار گرفت.

یافته ها: آموزش مبتنی بر راهکارهای خودتنظیمی، عملکرد نوشتاری اقناعی شرکت کنندگان را به صورت معناداری بهبود بخشیده است. بعلاوه، عملکرد نگارشی افراد شرکت کننده در دسته توصیفی در پس آزمون به مراتب بهتر از عملکرد آنان در پیش آزمون بود که انتقال یادگیری حاصل از آموزش راهکار-محور به عملکرد نگارشی در یک دسته مرتبط آموزش داده نشده را تأیید می کند. در واقع، جملاتی که شرکت کنندگان در پس آزمون ها نوشتند طولانی تر، دارای اجزای نگارش اقناعی و توصیفی بیشتر و با کیفیت و بودند.

نتیجه گیری: پیوست آموزش راهکار-محور با رویکرد نوشتاری به دوره های انگلیسی دانشگاهی برای دانشجویان پزشکی و دندانپزشکی در قالب راهکارهای خودتنظیمی مرتبط با دسته، یکی از اقدامات ضروری در افزایش توانایی نوشتن دانشگاهی دانشجویان پزشکی به نظر می رسد. یافته های این پژوهش پیشنهادها/ رهنمون های مشخصی برای دانشجویان و مدرسان انگلیسی برای اهداف دانشگاهی دارد.

واژه های کلیدی: انگلیسی برای اهداف دانشگاهی، دانشجویان پزشکی و داروسازی، دسته دانشگاهی، آموزش راهکار-محور

میڈیکل طلباء میں تحریری کارکردگی پر حکمت عملی کا اثر

بیک گراونڈ: موجودہ مطالعہ ایرانی میڈیکل اور فارمیسی کے طالب علموں کے ایک گروپ کی قائل تحریری کارکردگی پر خود ریگولیٹری حکمت عملیوں کی شکل میں حکمت عملی پر مبنی تعلیم کی تاثیر کی چھان بین کے لیے کیا گیا تھا۔ اس کے علاوہ، یہ تحقیق کرنے کی کوشش کی گئی ہے کہ آیا اس قسم سے تربیت سے متعلقہ تعلیمی زمرے کے طور وضاحتی تحریر پر بھی اثر پڑتا ہے۔

طریقہ: پہلے، ٹارگٹ گروپس میں ۳۰ مرد و خواتین میڈیکل اور فارمیسی طلباء کی تحریری کارکردگی کا پری ٹیسٹ کے دوران جائزہ لیا گیا۔ پھر، ۱۶ سیشنوں کے دوران، قائل تحریر کے زمرے میں خود کو منظم کرنے کی حکمت عملی سکھائی گئی۔ اس کے بعد، شرکاء کو قائل کرنے والے اور وضاحتی دونوں زمروں میں مخصوص موضوعات پر مضامین لکھنے کے لیے مدعو کیا گیا۔ پوسٹ ٹیسٹ میں، شرکاء کی تحریری کارکردگی کو مذکورہ زمروں کے فریم ورک کے اندر جانچا گیا۔

نتائج: خود ریگولیٹری حکمت عملیوں پر مبنی تربیت نے شرکاء کی تحریری کارکردگی کو نمایاں طور پر بہتر کیا۔ مزید برآں، وضاحتی پوسٹ ٹیسٹ کے زمرے میں شرکاء کی تحریری کارکردگی پری ٹیسٹ میں ان کی کارکردگی سے کہیں بہتر تھی، جو حل پر مبنی تربیت سے غیر متعلقہ زمرے میں تحریری کارکردگی میں سیکھنے کی تصدیق کرتی ہے۔ درحقیقت، امتحان کے بعد شرکاء نے جو جملے لکھے تھے وہ لمبے تھے، زیادہ قائل کرنے والے اور وضاحتی تحریری اجزاء تھے، اور عام طور پر بہتر معیار کے تھے۔

نتیجہ: زمرہ سے متعلق خود ریگولیٹری حکمت عملیوں کی شکل میں طلباء کے لیے یونیورسٹی کے انگریزی کورسز کے لیے تحریری نقطہ نظر کے ساتھ حل پر مبنی تدریس، میڈیکل کے طلباء کی تحریری صلاحیت کو بڑھانے کے لیے ضروری اقدامات میں سے ایک ہے۔ حل پر مبنی تعلیم کے میدان میں مطالعہ کے دائرے میں توسیع کے ساتھ، اس مطالعے کے نتائج میں تعلیمی مقاصد کے لیے انگریزی طلباء اور اساتذہ کے لیے مخصوص تجاویز اور رہنما اصول ہیں۔

کلیدی الفاظ: تعلیمی مقاصد کے لیے انگریزی، طبی اور فارمیسی کے طلباء، تعلیمی زمرہ، حل پر مبنی تعلیم

INTRODUCTION

One highly important productive skill which is usually not adequately taken into consideration in the majority of English for Specific Purpose (ESP) courses with specific reference to EAP is the issue of writing instruction. The development of the writing skill necessitates something beyond the accurate use of grammar and a good range of vocabulary, or linking the written words (1, 2). Rather, writing is assumed to be an aggregation of many components the most crucial of which are suggested to be evaluated for a course (3, 4). Traditionally, EAP practices across the globe have directed their focal attention solely on building students' competency in reading and vocabulary skills (5, 6, 7).

To respond to such demands, the present study took self-regulated strategy development model of instruction as a framework to examine its impact on medical students' persuasive academic writing performance and also on transfer of learning from an instructed genre (i.e., persuasive genre) to a non-instructed academic writing genre (i.e., descriptive writing). Notwithstanding the bulk of research carried out on strategy-based instruction (SBI) in the domain of second/foreign (L2) language learning (10, 11), this approach has fairly recently invigorated a growing body of work in the area of English for Academic Purposes (EAP) (12). Previous research on strategy-based instruction in the domain of EAP with specific reference to academic writing has disclosed that implementing learning strategies in general and language learning strategies in particular in the form of instructional interventions take up a significant share of variance in the improvements achieved (13, 14).

One specimen of effective SBI treatment in the realm of EAP has to do with the construct of self-regulation. Of a predominantly metacognitive nature, self-regulation has appealed the attention of a number of researchers in the last three decades (15, 16, 17, 18, 19, 20, 21). Zimmerman (1999, 2008) defined self-regulation as a series of planned self-generated thoughts, feelings, and activities conduced towards the achievement of preordained goals (15, 16). Owing to the fact that many L2 learners have certain degrees of difficulty in mastering writing skill, a number of specialists (17, 23) have developed an approach to instruct L2 writing which draws heavily on the principles of self-regulation. The approach, Self-Regulated Strategy Development (SRSD), reconciles a set of effective composing strategies whose ultimate goal is to aid writers to self-regulate the whole process of L2 writing. Implemented fully, SRSD associates strategy training with explicit self-regulation. Self-regulatory strategy development, according to Graham and Harris (2003), encompasses six stages: (1) Develop background knowledge, (2) Discuss it, (3) Model it, (4) Memorize it, (5) Support it, and (6) Perform it independently. These stages are flexible in that they provide general guidelines for teaching writing strategies and can be re-ordered, combined, or modified in order to meet the needs of the students and the teachers (18). Instruction following these stages explicitly guides students through the writing process, teaches students to monitor and manage their progress and affective responses while they write in L2.

Previous research in the context of Iran and abroad (5, 9, 10, 11, 12, 25, 27, 29, 31, 32) has pointed to the beneficial effects of SBI on improving the writing performance of L2 learners. In Iran, Alavi, Nemati, & Karimpour (2019) examined the effect of three genre-based instructional treatments on medical students' use of key features of the medical case report (12). The results corroborated the efficacy of explicit and implicit genre-based instruction treatments. Khojasteh, Hosseini, and Nasiri (2021) conducted a study to examine the impact of strategy-based and video-based-flipped writing classrooms on the academic writing performance of medicine students (35). Their results indicated that strategy- and video-based instruction significantly improved the academic writing performance of medicine students. Alenazi (2020) examined the predictive effect of self-regulated writing strategies on EFL students' writing performance (36). The results showed that both text processing and course memory strategies, as the regulatory strategies, predicted the writing performance of the participants.

Given the recent appeal for expanding research on language learning strategies (34) and the prominent role of language learning strategies (24, 9, 25) in general and self-regulation in particular (20, 16) in students' academic achievement especially in L2 and EAP writing , the current research aimed to examine the effect of SRSD instruction on EAP students' writing performance. Also it aimed to figure out the degree to which learning the SBI intervention carries over to a similar uninstructed writing genre. Accordingly, the following questions were raised:

1. Does self-regulatory strategy development (SRSD) significantly enhance the persuasive writing
    performance of Iranian medical students?
2. Does persuasive-specific SRSD instruction result in the transfer of learning to a similar
    non-instructed writing genre (i.e., descriptive writing)?

METHODS

Design
The present small-scale study utilized a pre-test post-test experimental design. As an intervention study, the participants received explicit genre-specific academic writing strategy instruction for eight weeks over a period of two months.

Participants
The participants were 30 medicine and pharmacy students from two intact IELTS classes at a language institute in Kermanshah. The participants were selected based on convenient sampling. Nine of the participants held doctor of medicine degree, seven held doctor of pharmacy and 14 were students studying in these fields. The participants were both males (N= 19) and females (N=11) and their ages ranged from 24-33. The participants were screened in terms of English language proficiency through the administration of an Oxford Placement Test (OPT) (26). The participants reported no prior experience with the treatment (SRSD). The two intact classes were taught IELTS writing by the researcher. The IELTS writing course took eight weeks to accomplish, i.e., each week two sessions.

Instruments

The first instrument administered was the OPT (26) that comprised 200 items to assess test takers' English language proficiency in terms of structure, vocabulary, listening and reading skills. The second instrument of the study was a writing prompt on which the participants were asked to write a persuasive essay before and after the instructional phase. The pre-test prompt asked the participants to write on "should the use of drugs like marijuana be legalized?" and the post-test prompt asked them to write on "man should stop the use of animals to test drugs". An experienced writing instructor and the researcher assessed all the essays according to the items of Miller's (27) holistic rubric designed for assessing persuasive essays. The first rater was asked to read the items of the holistic scale carefully and as training, he and the researcher rated a sample persuasive essay where the researcher clarified the points the first rater was not certain about. The persuasive holistic rubric (27) assessed persuasive essays on a scale from 0 (the essay contains no persuasive elements) to 10 (the essay contains almost all of persuasive elements). The total score for each essay was 20. The two raters rated the persuasive essays at the same time sitting in a room and in the cases of discrepancies, they discussed them until disagreements were resolved. To maximize the scoring validity, the essays were also assessed in terms of the general writing criteria of content, organization, vocabulary, language, and punctuation as highlighted in Jacobs et al.'s scale.

As the third instrument, the participants wrote essays on two descriptive prompts. At pre-test, the participants wrote descriptive essays on "describe a medical course you enjoyed the most" and at post-test, they wrote on "describe human anatomy". Similar to persuasive measurement procedures, descriptive essays (pre- and post-tests) were also scored by the researcher and a colleague of him to determine whether they contained basic descriptive elements and to examine whether the instructional effects transfer from persuasive genre to a similar, but different genre (e.g., descriptive genre). The essays were assessed based on the Analytic Scale for Scoring Descriptive Writing (28) that rates descriptive essays on four criteria, i.e., genre-related elements, language-related elements, content and organization, and mechanics on a scale from 4-34 points. Besides, 6 points were also considered for the elements of clarity and brevity of descriptions while rating the essays. Inter-rater reliability of the two raters was calculated through Cronbach α formula (r=.081)

The Instructional Phase

The participants in both classes received explicit persuasive-specific strategy instruction in the form of self-regulated strategy development (SRSD). Drawing substantially on POW and TREE persuasive-specific regulatory strategies (22), students were taught how to plan and write persuasive essays. The mnemonic **POW** stands for **P**ick my idea, **O**rganize my notes, **W**rite and say more. **TREE** represents the four integral elements of a persuasive essay: **T**opic, **R**easons and counter reasons, **E**xplanations, and **E**nding (wrap it up). The intervention program was organized around six 70-85

minute lessons each devoted to one of the six stages involved in SRSD (18, 22, 23).

The first lesson was designed with the aim of developing background knowledge and skills students needed to practically apply POW and TREE persuasive-specific regulatory strategies. As the first step at this stage, the whole class discussed the elements of a quality persuasive essay. During the next step, the instructor elaborated on POW+TREE mnemonics as well as the graphic representation of a tree. The first lesson moreover unveiled the mnemonics as stated earlier. Later in the same session, the participants were given time to pinpoint the four elements (TREE) in a sample persuasive essay.

The second lesson began with a review of the first lesson. Then, the instructor explained the significance of counter reasons to persuasion along with the ways to refute them. The second lesson terminated with students analyzing another example essay to figure out the counter reasons. Lesson 3 signaled the second stage of the intervention (i.e., *discuss it*) during which participants practiced once more different parts of POW and TREE mnemonics to check their understanding. Subsequently, self-monitoring and goal-setting were introduced as two important steps to be taken in the writing process followed by emphasis on a new technique known as graphing whose function was to help participants monitor their writing process.

The fourth lesson (*model it*) was planned specifically to provide the participants with correct models of strategy use while writing persuasively. In so doing, the learners were presented with techniques and procedures to apply POW and TREE. Following the model the instructor practically introduced, the participants were asked to exert their bests to produce persuasive essays as close as possible to what the instructor catered for.

In the course of the next stage (*support it*), a goal was set by the whole class: all the participants were asked to write a persuasive essay as a group. At this point, the instructor just observed their performance and contributed almost nothing to the whole process of writing. Having finished the task at hand, the participants were asked to review their essays and figure different parts out in a separate sheet all to check if they had achieved the collaboratively-set writing goal. Finally, in the sixth stage (independent performance), the participants built upon the genre-specific strategy to plan and write persuasive essays independently.

RESULTS

Before performing the analysis of data, the normality of collected data was assessed using skewness test. The results of this test revealed significant values close to zero both in the pre-test (sig= .034) and in the post-test (sig= .156) showing that the distribution of data is normal and it is possible to use parametric tests. In order to analyze the scores, paired samples t-tests were run.

The First Research Question

The first research question asked if self-regulatory strategy development (SRSD) significantly enhances the writing performance of Iranian medical students? The main source

of data for this study came from the analysis of essays written by the participants across the two writing genres in pre- and post-test administrations. To this end, the mean scores of the participants' performances on pre and post writing probes were compared through Paired-Samples *t*-tests to determine if they performed significantly differently.

Table 1. The Means of Participants' Scores on Persuasive Essay Pre- and Post-test				
		Mean(SD)	N	Std. Error Mean
Pair 1	Pre-test	9.83(1.55)	30	.28399
	Post-test	13.71(1.76)	30	.32193

Based on Table 1, the mean of the participants' scores on the persuasive essay pre-test (M= 9.8333) was less than their mean at the post-test (M =13.7117). Moreover, the standard deviation of the pre-test scores equaled 1.555 while its value turned out to be 1.763 in the post-test.

The results of Table 2 demonstrate that, at 29 degrees of freedom (df=29) and at the meaningful level of 0.000 (sig= 0.000), the SRSD treatment led to improvements in persuasive writing ability of the participants at the post-test as compared to the pre-test. Thus, the self-regulatory strategy instruction significantly influenced the participants' performances on academic persuasive essay writing. In the post-administration of the persuasive writing prompt, the participants wrote essays which were longer, qualitatively better, and contained more integral persuasive parts compared to the ones they wrote prior to the intervention actually began. Example sentences from a participant's persuasive essays at pre- and post-tests clearly illustrates this observation. At pre-test, this participant wrote the following thesis statement, "because of many reasons, the use of marijuana should be legalized" while at post-test, he formulated a longer, more divided, and more informative thesis statement, "exploiting animals for testing drugs is by no means acceptable and has to be stopped through adopting several alternative procedures such as the use of computerized models, human volunteers, and simulator programs."

The Second Research Question
The second research question examined if SRSD on persuasive genre of writing results in transfer of learning to a similar non-instructed writing genre (i.e., descriptive writing). To answer the second research question, a Paired-Samples *t*-test was run to identify any significant difference(s) between the participants' performances on the pretest and posttest descriptive essays.

Table 3 tabulates the means of the participants' scores at the pre-test descriptive essay where the mean (M= 10.0333) was less than of their scores at the post-test (M =14.2145).

Table 2. Paired samples test comparing the means of participants at pre- and post-test persuasive essay								
		Paired Differences						
		Mean (SD)	Std. Error Mean	9545 Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1	pretest – post-test	- 4.00000 (2.7668)	.50515	-5.03314	-2.96686	-7.919	29	.000

Table 3. The means of participants' scores on descriptive essay pre- and post-test				
		Mean (SD)	N	Std. Error Mean
Pair 1	pretest	10.03 (1.65)	30	.30127
	Post-test	14.21 (1.73)	30	.31617

Table 4. Paired samples test comparing the means of participants' scores on descriptive essay pre- and post-test								
		Paired Differences						
		Mean (SD)	Std. Error Mean	9545 Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1	pretest – post-test	- 4.00000 (2.6909)	.49130	-5.00483	-2.99517	-8.142	29	.000

Based on Table 4, at 29 degrees of freedom (df=29) and at the meaningful level of 0.000 (sig= 0.000), the kind of learning participants gained as a result of explicit self-regulatory strategy instruction significantly carried positively over to their performance on a related different academic genre, i.e., descriptive writing. Therefore, persuasive-specific self-regulatory strategy instruction resulted in the transfer of learning to a similar non-instructed writing genre (i.e., descriptive writing).

DISCUSSION

The main purpose behind the conduct of the present study was two-fold: first, to examine the effect of self-regulatory strategy-based instruction on EAP students' persuasive academic writing performance and secondly, to explore if such instruction carries over to a non-instructed related genre. The findings of the study revealed that genre-specific writing strategy intervention is beneficial to medical students. Specifically, participants' performances on the post-test persuasive writing showed a statistically significant increase in their quality compared to those in the pre-test. The study also found out that persuasive-specific strategy instruction contributed to the body of strategic knowledge/competence in participating students in that they successively transferred such knowledge to the writing of descriptive essays for which they did not receive any sort of instruction.

Explicit instruction of self-regulatory strategies in the form of POW and TREE endowed the participants the ability to regulate fairly independently their persuasive writing performance. That is, the SRSD instruction was effective in guiding medical students in the process of academically generating ideas, setting aims, organizing and converting their ideas into persuasive written text. The results of the previous studies (11, 21, 22, 23) in which the SRSD instructional intervention significantly enhanced participants' genre-specific writing ability are in line with the results gained from the first research question.

The writing processes of planning, editing, and revising were reinforced, as a result of SRSD, by the application of relevant self-regulatory strategies (POW+TREE). In practice, these strategies functioned as a blueprint through which the medical students were able to plan, organize, and transform their ideas into the text. It has to be stressed that the learning- and learner-centered nature of the class led to a condition where students' preferences were prioritized hence reassuring them to take more attentive responsibility for their own learning with particular reference to persuasive writing performance. As Samanian and Roohani (11) argued, students' reflection on the learning processes in which they engage, as a corollary of the SRSD intervention, is influential in maximizing their knowledge of cognition (metacognitive knowledge) and regulation of cognition. Besides the teaching methodology adopted, the success of the SRSD program could also be attributed to the need-oriented nature of the model complemented with the inclusion of both cognitive (POW) and metacognitive (TREE) strategies.

The findings from the first research question corroborate the findings of past studies (29, 9, 11, 5, 14) which pointed to the beneficial effects of strategy-based instructional interventions of diverse frameworks including SRSD on improving the writing ability of EAP and English as a foreign language (EFL) students. Exploring the effects of Cognitive Self-Regulation Instruction (CSRI), a general approach to teach writing sharing certain important features with SRSD approach, on the writing ability of grade six Spanish learners, Torrance et al. (2007) found out that CSRI approach was effective in improving participants' writing (29). Moreover, they investigated transferability of the CSRI strategies to two uninstructed genres and the results proved transferability of CSRI effects to two uninstructed genres as students transferred the strategies to new contexts successfully.

The findings out of the first research question are supported by those found in Teng and Zhang (2019) who examined the effect of self-regulated learning strategies-based writing instruction on students' L2 writing proficiency (33). The participants in their study became more operational in applying a range of self-regulatory strategies such as metacognitive strategies, motivational regulation strategies, and social behavior strategies (33).

The results of this study are in line with the findings from De Silva (2015) in which SBI improved the writing ability of a group of EAP students (9). The findings gained from the first research question are further in line with those in Alavi, Nemati, and Karimpour (2019) which pointed to the beneficial effect of both explicit and implicit genre-based instruction treatments.

The second question findings are also in line with the results of a number of studies (22, 18, 30, 19, 21, 25). Generally, the participants who took part in these pieces of research were first taught certain self-regulated strategies explicitly together with specific genre-specific strategies (for example, narrative specific strategies) and then tested to determine whether the kind of learning resulted from such instruction is transferable to other non-instructed genres.

This study was limited at least in two ways and its results needed to be interpreted cautiously. First, similar to what was observed in other investigations using a pre-/ post-test research design, assessing students' improvement in writing as a corollary of the intervention was fairly thoroughly dependent on their performances on two writing prompts, i.e., one before the treatment and one following it. Secondly, the persuasive essays medical students wrote in this study were assessed by one holistic rating scale. More consistent ratings may be achieved if analytical rating scales are also used.

The results of this study revealed that the application of explicit self-regulatory strategy-based instruction in teaching academic persuasive writing genre can significantly influence the persuasive writing ability of the participants. Furthermore, the results pointed to the beneficial effect of such instruction on the students' performance on descriptive writing as a related non-instructed genre. The findings additionally lend strong support to the idea that through the regulation of cognition, medical students can become fully operational in regulating their academic writing activities especially by the use of general and persuasive-specific

writing strategies which direct them to expansively engage their cognitive and metacognitive repertoires while undertaking diverse academic tasks.

Ethical considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors. The ethics code issued for the research is 187.

REFERENCES

1. Ding A, Bruce I. The English for academic purposes practitioner: Operating on the edge of academia. Palgrave Macmillan; 2017.
2. Richards JC. Theories of teaching in language teaching. In JC Richards, WA Renandya (Eds.), Methodology in language teaching: An anthology of current practice (pp. 19-25). New York: CUP; 2002.
3. Cheng A. Genre analysis as a pre-instructional, instructional, and teacher development framework. J Engl Acad Purp. 2015; 19: 125-36.
4. Raimes A. Ten steps in planning a writing course and training teachers of writing. In: Richards JC, Renandya WA, editors. Methodology in language teaching: An anthology of current practice. New York: CUP; 2002. P. 306-14.
5. Atai MR, Taherkhani R. Exploring the cognitions and practices of Iranian EAP teachers in teaching the four language skills. J Engl Acad Purp. 2018; 36: 108-18.
6. Paltridge B. Academic writing. Language Teaching. 2004; 37: 87-105.
7. Paltridge B. Writing for academic journals in the digital era. RELC Journal. 2020; 51(1): 147-57.
8. Benesch S. Theorizing and practicing English for academic purposes. J Engl Acad Purp. 2009; 8: 81-85.
9. De Silva R. Writing strategy instruction: Its impact on writing in a second language for academic purposes. Language Teaching Research. 2015; 19(3): 301-23.
10. Fathi J. Feizollahi B. The effect of strategy based instruction on EFL writing performance and self-regulated learning. Scientific Journal of Language Research. 2019; 11(33): 23-45, Persian.
11. Samanian S, Roohani A. Effects of self-regulatory strategy development on EFL learners' descriptive writing and reflective thinking. Research in English Language Pedagogy. 2018; 6(1): 95-116, Persian.
12. Alavi S, Nemati M, Karimpour S. The impact of genre-based instruction treatments on EAP students' writing quality. Journal of Modern Research in English Language Studies. 2019; (in press): doi: 10.30479/jmrels.2019.11620.446, Persian.
13. Han J, Hiver P. Genre-based L2 writing instruction and writing specific psychological factors: The dynamics of change. J Second

Lang Writ. 2018; 40(1): 44-59.
14. Plonsky L. The effectiveness of second language strategy instruction: A meta-analysis. Lang Learn. 2011; 61(4): 993-1038.
15. Zimmerman BJ. Commentary: toward a cyclically interactive view of self-regulated learning. Int J Educ Res. 1999; 31(2): 545-51.
16. Zimmerman B. Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. Am Educ Res J. 2008; 45(1): 166-83.
17. Graham S. Harris KR. The role of self-regulation and transcription skills in writing and writing development. Educ Psychol. 2000; 35(1): 3-12.
18. Graham S, Harris KR. Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In: Swanson L, Harris K, Graham S, editors. Handbook of learning disabilities. New York: Guilford Press; 2003. P. 383-402.
19. Graham S, Harris KR, Mason LH. Improving the writing performance, knowledge, and self-efficacy of struggling young writers: The effects of self- regulated strategy development. Contemp Educ Psychol. 2005; 30: 207-41.
20. Zimmerman B. Becoming a self-regulated learner: Which are the key sub-processes? Contemp Educ Psychol. 1986; 11(2): 307-13.
21. Mason LH, Harris KR, Graham S. Self-regulated strategy development for students with writing difficulties. Theory Pract. 2011; 50(1): 20-27.
22. Harris KR, Graham S, Mason LH. Improving the writing, knowledge, and motivation of struggling young writers: Effects of self-regulated strategy development with and without peer support. Am Educ Res J. 2006; 43(2): 295-340.
23. Harris KR, Graham S. Making the writing process work: Strategies for composition and self-regulation. Brookline, MA: Brookline Books; 1996.
24. Cohen AD. Strategies in learning and using a second language. 2th ed. London: Longman; 2011.
25. De Silva R, Graham S. The effects of strategy instruction on writing strategy use for students of different proficiency levels.

System. 2015; 53(1): 47-59.
26. Allan D. Oxford Placement Test 2. Oxford: Oxford University Press; 2004.
27. Miller KM. Examining the effects of self-regulated strategy development in combination with video self-modeling on writing by third grade students with learning disabilities. Unpublished PhD dissertation. University of Central Florida: Orlando, Florida; 2013.
28. Khatib M, Mirzaii M. Developing an analytic scale for scoring EFL descriptive writing. Journal of English Language Teaching and Learning. 2016; 17(1): 49-73, Persian.
29. Torrance M, Fidalgo R, Garcia J. The teachability and effectiveness of cognitive self-regulation in sixth-grade writers. Learn Instr. 2007; 17(3): 265-85.
30. Saddler B, Moran S, Graham S, Harris KR. Preventing writing difficulties: The effects of planning strategy instruction on the writing performance of struggling writers. Exceptionality. 2004; 12(1): 3-17.
31. Farrokh Eslamloo N., Sarkhosh M, Gholami J. The differential effects of three different approaches to the teaching of English for medical purposes. Stud Med Sci. 2017; 28(4): 1-15.
32. Ranjbar N, Soodmand Afshar H.A Survey of EAP Needs in Iran from the Viewpoints of Teachers and Students. Iranian Journal of English for Academic Purposes. 2021; 10(1): 54-74, Persian.
33. Teng LS, Zhang LJ. Empowering learners in the second/foreign language classroom: Can self-regulated learning strategies-based writing instruction make a difference? J Second Lang Writ. 2020; 48: https://doi.org/10.1016/j.jslw.2019.100701.
34. Griffiths C. Language learning strategies: Is the baby still in the bathwater? Appl Linguist. 2019; 41(4): 607-11.
35. Khojasteh L, Hosseini SA, Nasiri E. The impact of mediated learning on the academic writing performance of medical students in flipped and traditional classrooms: Scaffolding techniques. RPTEL, 2021; 16: https://doi.org/ 10.1186/s41039-021-00165-9, Persian.
36. Alenazi MH. The predictive effects of self-regulated writing strategies on writing performance of Saudi EFL university students. Journal of Educational and Psychological Studies 2020; 14(4): 668-82.