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A suggested program based on 7E Instructional Model and AWE Systems to Develop Faculty of Education ESP Students' Academic Writing Skills

BY

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Abstract

The aim of the current research was to investigate the effect of a suggested program based on 7E instructional model and AWE systems on developing faculty of education ESP students' academic writing skills. The design of the present research was a pre-post experimental group. The participants of the research were thirty second year, ESP students enrolled in English Chemistry, Biology and Science sections at Faculty of Education, University of Sadat City. They were taught using the suggested program based on 7E instructional model and AWE systems. The instrument of the research was an ESP academic writing test with a rating scale for assessing the participants' academic writing skills. The test was applied to the participants of the research before implementing the suggested program to measure their level in academic writing skills. Then, it was re-applied after the implementation of the suggested program. Results of the research have revealed that second year, faculty of education ESP students' academic writing skills were developed after the implementation of the suggested program. Accordingly, the suggested program based on 7E instructional model and AWE systems was found to have a positive effect on developing faculty of education ESP students' academic writing skills.

Key words: 7E instructional model, AWE systems, Academic writing skills, ESP students

**برنامج مقترح قائم على نموذج 7E التعليمي و نظم التقويم الالي للكتابة
لتنمية مهارات الكتابة الاكاديمية في اللغة الانجليزية للأغراض الخاصة
لطلاب كلية التربية**

ملخص الدراسة

هدف البحث الحالي الى معرفة أثر برنامج مقترح قائم على نموذج 7E التعليمي ونظم التقويم الالي للكتابة على تنمية مهارات الكتابة الأكاديمية في اللغة الإنجليزية للأغراض الخاصة لطلاب كلية التربية. وقد شارك في البحث مجموعة قوامها 30 طالب وطالبة من طلاب الفرقة الثانية المدرجين باقسام (الكيمياء- التاريخ الطبيعي- العلوم) باللغة الانجليزية بكلية التربية، جامعة مدينة السادات. وتضمن البحث الحالي اختبار مهارات الكتابة الأكاديمية في اللغة الانجليزية للأغراض الخاصة مصحوبا بمقياس تصحيح من اعداد الباحثة لقياس مهارات الكتابة الأكاديمية لدى عينة البحث. وقد تم تطبيق اداة البحث قبلها على عينة البحث، ثم تم تطبيق البرنامج المقترح. بعد انتهاء تطبيق البرنامج المقترح على الطلاب المشاركين في البحث، تم تطبيق الاختبار عليهم بعديا لمقارنة النتائج إحصائيا. أثبتت نتائج البحث أن البرنامج المقترح القائم على نموذج 7E التعليمي ونظم التقويم الالي للكتابة ساعد بايجابية على تنمية مهارات الكتابة الأكاديمية في اللغة الإنجليزية للأغراض الخاصة لطلاب كلية التربية في اقسام (الكيمياء- التاريخ الطبيعي- العلوم) باللغة الانجليزية.

الكلمات المفتاحية: نموذج 7E التعليمي، نظم التقويم الالي للكتابة، مهارات الكتابة الأكاديمية، طلاب اللغة الإنجليزية للأغراض الخاصة

Introduction

EFL (English as a foreign language) students learn English to be able to communicate with others, recognize different cultures and backgrounds, gain self-confidence, view their own culture from different perspectives, transfer their thoughts, organize their ideas and broaden their own capabilities. A main purpose of EFL writing skills, as any other language skills, is to enable learners to communicate through writing to express their thoughts using their own words as writing is a key feature of each learner's experience. It is important for fulfilling endless social activities such as, educational assignments, reports, letters, articles, applications and each aspect of daily life. But writing primitive paragraphs and essays in English does not simply mean that learners will become accepted academic writers. Rather, it is essential for learners to know what academic writing is and how to write in the best way to convince readers avoiding unclear and vague writings.

As a direct influence of globalization, the concept global English has led to the increasing demand of highly qualified professionals who can develop command of the 21st century requirements. Thus, a growing expansion in English-medium programs has appeared. Accordingly, English for academic purposes (EAP) and English for specific purposes (ESP) have become demanding areas that require special practices and perspectives by experienced instructors (Basturkmen, 2019; Kirkgoz, 2019). The number of ESP courses particularly for higher education is increasing and growing. But research in this field focuses mainly, as indicated by (Basturkmen, 2012; Johns, 2013), on discourse analysis, needs analysis, genre and corpus studies neglecting inquiry and implementation. Further, courses in ESP are found to focus on preparing students for future profession through putting emphasis on lexis and less on writing (Chitez & Bercuci, 2019, p. 76).

In English language teaching (ELT) classes, as illustrated by Sarmiento, Viana and Bocorny (2018), there are learners whose main focus is to master English in general as a language without prioritizing any specific application and use. Hence, the target to be reached is studying English for general purposes (EGP) to achieve proficiency and mastery over the main four language skills. On the other hand, there are other learners whose major aim is not to improve English proficiency indiscriminately, but to study English for specific purposes (ESP) as a stakeholder. Specific purposes for ESP learners may be related to their

careers or academic majors. Thus, English for ESP learners becomes a means to fulfill their requirements and needs to write a research, a scholarly article, a laboratory report, a case-study, reflective diaries, and/or posters. These various types of texts are normally referred to as genres. According to Lirola (2015, p. 192) the genre theory assists university students to increase their abilities to effectively function with a given set of discourse practices related to their social and cultural contexts, considering the text a matter and a result of social action. Consequently, ESP learners need to be well qualified and prepared to be able to respond to various contextual factors. However, non-native English speakers who are considered newcomers to writing in their academic majors and disciplines often fail to focus on contextual factors and create a proactive and a positive attitude towards writing (Cortes, 2011, p. 65). Consequently, ESP instructors and learners roles should be complementary as instructors can learn with their students more about their majors through applying their language and pedagogical skills as well as paying attention to stylistic elements of academic writing (e.g. tone, diction and overall structure), while learners can learn how to use English successfully in their various contexts focusing on the specific purpose of writing.

In the same context, ESP university students encounter some challenges related to their writing skills. They are not only required to be able to compose, rephrase, analyze ideas and transmit them into new argumentative texts, but also they should be able to write academically through advancing their ideas into a framework or a knowledge discipline and engaging their readers in their academic discourse. Academic writing is without any doubt the formal language of research and scholarship that ensures eligibility of higher education and students' acceptance in academia (Giridharan, 2012, pp. 578-579). Academic writing skills help ESP higher education students enhance their research skills and adopt the genre and styles of academic discourse (Tardy, 2010; Giridharan, 2012). Students' achievement in all academic disciplines was found to be highly correlated to their academic writing skills. If students lack academic writing skills or obtain poor levels of them, they will fail to fulfill their academic requirements, needs and expectations, regardless of the specific subject area (Borglin, 2012; Giridharan, 2012; Margolin & Ram, 2013).

Literature review

Writing is an important aspect of communication. It enables learners to connect with others to deliver the intended message in a proper way (Mekhane & Khelef, 2016, p. 5). Academic writing is a type of writing which is highly required in high school classes and university courses (Oshima & Hogue, 2007, p. 4). Altunkaya and Ayranci (2020, p. 89) have added that academic writing is a genre resorted by an intended audience who can comment within the scope of a discipline and relies on certain principles. In addition, academic writing refers to students' abilities to write in the linguistic, cognitive and sociocultural domains after fulfilling the writing courses (Sukesi, Ezmir & Akhadiyah, 2019, p. 178). Bailey (2003, p.vii) explained that academic writing allows learners in flexible ways to work either with an instructor or by themselves, to practise certain areas related to their fields of study. As illustrated by Senel (2018, p. 115) in academic writing, learners have to apply various complicated cognitive strategies in order to transmit their thoughts and ideas in accepted written formats for their readers. Due to this complexity, learners form negative attitudes towards academic writing skills which in turn negatively influence their academic achievement and progression in language classes.

Teaching academic writing courses for ESP students is crucial and essential for their professional and academic progression. However, Hyland (2013) has indicated that teaching writing for ESP university students focuses only on assisting students to achieve competence in a particular target. Rather, ESP students should learn particular types of writing that are related to their professional context. Similarly, ESP writing instructors should recognize that teaching writing for ESP students is far more than focusing on linguistic errors and technical aspects of grammar, style and organization. ESP students need to interact with their readers using their previous experience. For achieving writer-reader interaction, they need to use academic writing skills that are thought to help them write precise and unbiased types of writing related to their professional fields as, notes, reports, papers, dissertations/theses, essays/journal articles, classifications, comparisons, problems and solutions, recommendations, literature reviews and surveys (Bailey, 2003, pp. 9-10).

Despite the importance of obtaining academic writing skills among ESP university students for achievement and research purposes, many

ESP students encounter serious problematic issues in acquiring academic writing skills. Al-Fadda (2012) and Caldwell (2012) have indicated certain factors that can negatively affect the acquisition of academic writing skills among university students as, non-Anglicized linguistic (the inability to respell foreign words or accept phonological adaptation) and cultural backgrounds, limited linguistic competency as well as various problems encountering university students at language classes (e.g. foreign language anxiety- poor relations with peers and instructors- learning difficulties).

Types and features of academic writing

There are various types of academic writing as mentioned by Bailey (2006), Aydin and Baysan (2018) and Hale, Taylor, Bridgeman, Carson, Kroll and Kantor, Shang-Bulter (2015) as: book reviews, notes, proposals, case studies, journal articles, essays, translations, presentations, dissertations, research papers, summaries, reports on experiments/observations with interpretations, short tasks, and documented computer programs. Campbell (2019, p. 611) have indicated that some of the previously mentioned kinds of academic writing are objective (e.g. reports on experiments- summaries- documented computer programs), while some other types are subjective (e.g. essays- observations with interpretations- case studies- proposals- book reviews). In the same context, research papers and short tasks are considered both subjective and objectives according to the target or the goal. Besides, two more types of academic writing: annotated bibliographic and literature review were added to academic writing types. Academic writing features should be reflected in each type of academic writing texts. Academic writing features as indicated by Bailey (2006, p. 13) include: suitability, formal vocabulary, impersonal style, use of references, and use of long as well as complex sentences.

Moreover, Faigley, Lester, Graves and Graves (2008) have clarified several features of academic writing as: (1) introduction that is used to introduce, inform, and engage readers and it should be specific with no generalizations, (2) organization and structure that represent students' abilities to introduce their ideas in logical outlined sequence through grouping them according to how they are related to each other, (3) paragraph development: each paragraph should present one clear idea to fully introduce it, (4) word choice: students should make the text readable not unbearable to read through avoiding outdated words and

jargon, (5) sentence construction: writers should limit each sentence to one idea to help readers get the point, and (6) spelling and grammar: proper grammar is essential in creating concise writing and spelling mistakes can change the meaning the writer intended to use. Following academic writing features can help writers think clearly and logically when doing their assignments and neglecting them can lead to serious writing difficulties.

Academic writing difficulties

Writing is a complicated process that involves psychological difficulties related to lack of interaction or benefit from immediate feedback, linguistic difficulties that are related to grammatical problems as repetition, fragments and cognitive difficulties that appear in relation to certain mental activities like thinking, analyzing as well as comprehending (Byrne, 1991, p. 4). ESP students face serious challenges and problematic issues in academic writing. Due to these problems, researchers have collected some problems that students encounter in academic writing classes. The first problem is knowledge about academic writing conventions. Students' writings always contain grammatical, spelling and punctuation mistakes and errors, their sentences are not properly organized and not stated clearly. These problems are not resulted from lack of language skills but they are the direct result of lack of proper training in logical thinking skills (Lai, 2010; Caldwell, 2012).

A second problem is that fluent students who excel orally suppose that they will directly excel in academic writing without appropriate training and preparation. A third major problem ESP students face in academic writing is plagiarism. Students did not receive proper classes and training on how to cite and they unknowingly commit plagiarism. According to Anney and Mosha (2015, p. 203) plagiarism is a fraud behavior when university students use technological facilities to have someone work and submit it as their own without any documentation. This serious problem is growing among university students particularly in the era of technology and internet.

Some researchers attempted investigating academic writing skills trying to improve them among learners' of English using different approaches, methods and techniques. Examples of them are: Ganaw (2017) has examined the needs and lack of academic writing skills among learners. The results of the study revealed that the participants

have never been enrolled in academic writing courses or programs and they encounter huge difficulties in academic writing skills. Further, Zaghwarni (2018) has explored whether teaching pedagogical grammar was helpful to enrich students' academic writing skills. The findings of the research showed that students encounter serious challenges in their academic writing skills due to lack of grammar. Chitez and Bercuci (2019) have explored the potential of corpus consultation approaches in developing English for Specific Purposes (ESP) students' academic writing skills. The findings indicated a significant differentiation in the complexity of the lexico-grammatical features used by ESP students in consequent intervention stages and a better integration of L2-related academic writing strategies into their written productions. The study highly recommended the integration of computer-processed language databases in data driven learning (DDL) strategies for ESP students in the Romanian university context.

In the same context, Deri (2019) examined the present situation of teaching and learning substitution and ellipsis and the problems EFL university students encounter in their academic writing skills. The results of the research clarified that the students lack the ability to write appropriately and accurately. Ebadi and Rahimi (2019) aimed to find out the short and long term impact of dynamic assessment (DA) on EFL students' academic writing skills through one-on-one individual and online synchronous DA sessions over Google Docs. The findings of the research have indicated significant development in EFL academic writing skills in all the four areas of task achievement, coherence, cohesion, lexicon, grammatical range and accuracy. In their study, Pham, Lin, Trinh and Bui (2020) have examined whether electronic peer feedback (e-PF) can be incorporated in Confucian heritage culture (CHC) contexts to enhance EFL university students' academic writing and reflective thinking skills. The findings of the study has illustrated that using e-PF was effective in improving EFL students' academic writing skills and nurturing reflective thinking in CHC cultures. Besides, Al Shlowiy and Layali (2021) investigated the perceptions of the benefits and drawbacks of applying Facebook in EFL academic writing. The findings of the research have identified six benefits and two drawbacks of using Facebook in EFL academic writing.

Elements and characteristics of academic writing

Academic writing deals with the analysis of beliefs and experiences in basis of certain well determined elements and ingredients as opposed to personal writing discourses. Academic writing is considered a type of writing that follows governing practices and rules that focus mainly on grammar, spelling, punctuation structural aspects, planning and organization of ideas and experiences. Besides, the physical structure of academic writing requires dividing the written discourse into the beginning, the middle and the end. The beginning introduces general information about the topic; the middle represents the body of the topic that offers illustrations, analysis and a detailed discussion about the topic; the end is the conclusion or the summary of whatever was presented earlier. Academic writers should obtain the abilities to produce proper writing outline using a proper and a concrete language, precise summary, formal tone, apt words as well as phrases, referencing and presentations in the third person. Moreover, academic writers should avoid applying slangs and abbreviations (Al-Mansour, 2015, p. 96).

In addition to the previously mentioned elements, academic writing as a formal type of writing that opposes personal writing discourses demands a number of characteristics. Yugianingrum (2010, pp. 40-41) has indicated certain characteristics of academic writing as it is viewed as a writing type that should: (1) play a significant role in relating the community issues to the writing classes, (2) be interesting for the writer, who believes that there is more to discover about it, (3) reflect the aesthetic quality of the text, and (4) access relevant and various resources to show information relevant to the topic avoiding unnecessary descriptive details. In addition, seven other characteristics of academic writing were added by Irvin (2010, pp. 15-16) as follows: (1) it is argumentative in nature (it makes a point and supports it), (2) it is interpretive in nature (the stated point is debatable and open for interpretation), (3) it should have a clear introduction, body and conclusion, (4) using quotations, continuous movement of logic and enough support to be convincing are required, (5) documenting sources is required (using MLA or APA formats of documentations), (6) editing final drafts carefully before turning them in for grammatical correctness is necessary, and (7) transition sentences are important to link paragraphs or sections.

Similarly, Hinkle (2004) has argued that academic writing requires four rhetorical and discourse characteristics. Firstly, it is always presented for specific narrow purposes and it must be limited to the scope of the study. Secondly, it should have specific structure, presentation and organization. Thirdly, it usually presents an overall structured argument supported by other secondary arguments. Fourthly, it is a specific style of writing that focuses heavily on avoiding colloquial language. Thus, Academic writing is not an ordinary writing about grammatical correctness. It is about achieving a desired influence on a target audience. It includes steps, aspects, purposes and priorities as it is considered an argument that shapes readers' beliefs towards certain issues through providing them with proper data, various resources and all needed knowledge and information. In addition, academic writing is an analysis that begins by stating several probabilities and hypotheses about an investigated topic, then making clear illustrations on the core points and finally logically relating probabilities to explanations (Irvin, 2010, pp. 8-9). In the same context, Bailey (2006, pp. 36-37) has outlined certain steps that contribute to achieving scientific academic writing as, combining different sources to promote writing skills, mixing direct quotations with arguments' summary and avoiding plagiarism which has become a major obstacle for university students and researchers in all majors.

What is Plagiarism?

Plagiarism is a major research problem and a growing academic issue that encounter university students and researchers in all fields. It refers to someone using someone else's intellectual and original product (e.g. ideas, suggestions, creative work, original words, interpretations or findings) and implying that this product is his or her own whether this product is found in a printed paper copy or an electronic one (Helgesson & Eriksson, 2015; Douglas & Watt, 2019). So, plagiarism according to the previous definition involves two steps: (1) appropriate the intellectual product of others and (2) passing it off as one's own by not giving proper citation. Plagiarism then delays learning and usually represents a major issue that hinders the progression of learners of English as a second or a foreign language. Bethany (2016, p. 1050) has presented some reasons and roots of plagiarism that non-native English speakers occasionally encounter as: cultural confusion and foreign language frustration (Baty & Caulcutt, 2005; Hu & Lei, 2015) and the internet growing culture of "

copy and paste" due to the accessibility of academic sources using technology without stating clear integrity policies (Liles, 2019). In addition to the previous roots and reasons, Tindall (2020) has added that emotionality may be highly related to learners' attitudes towards plagiarism. The lack of positive affect and the increase of negative emotionality as depression, anxiety and stress are significant predictors of attitudes towards plagiarism.

The researcher noticed when extrapolating the previous literature related to academic writing skills among ESP students, that there was a dearth of research that addressed these skills among ESP students. However, in recent years, it has been noticed that the number of researchers who have been interested in studying these skills has increased due to the extreme importance of academic writing, especially in light of the tremendous progress in information and communication technology and students' urgent need, to master academic writing skills, to be able to keep pace with the world. Many researches have agreed on the urgent necessity to introduce the academic writing course as one of the basic courses for both undergraduate and postgraduate students so that they can communicate with other researchers of same majors at different parts of the world. Researchers have also been interested in presenting and studying numerous approaches, strategies, teaching methods and instructional models to investigate their effects on developing learners' academic writing skills. The fundamental role of technology-based instruction in all these educational aspects was vastly noted. Among the instructional models that are highly recommended to be used in developing university students' language skills, is the 7E instructional model.

7E instructional model

This research paper will adopt the 7E instructional model; a constructivist model used in science curriculum and relies on seven instructional phases. The 7E instructional model is the second new modified model based on the Biological Sciences Curriculum Study's (BSCS) 5E Instructional Model of (Bybee, 1997) which has relied on five instructional phases: engagement, exploration, explanation, elaboration and evaluation. The first modified model was the 6E instructional model that includes: engage, explore, explain, engineer (extend or elaborate), enrich and evaluate. This model has added the "enrich" phase to the 5E instructional model. The purpose of the

"enrich" phase is to offer an opportunity for learners to explore in depth what they have learned and to be able to transfer concepts and terms to more complex and complicated issues and problems (Barry & Burke, 2013; Hashim, Ali & Shamsudin, 2018).

The second modified model (7E instructional model or the learning cycle 7E model) is a student-oriented model that consists of seven stages of organized activities to help students learn by active role playing. These stages are: elicited, engage, explore, explain, elaborate, evaluate, and extend (Fitri & Nur, 2018, p. 18). In the 7E instructional model, the engage phase of 5E model is expanded into elicited and engage to focus on students' eliciting tactic and prior knowledge. In addition, the elaborate and evaluate phases of the 5E model are expanded into elaborate, evaluate and extend. Elaborating and introducing the current issue, evaluating it, then extending and transferring recently acquired concepts and skills to new situations. The following table illustrates the differences between the 5E model and its two expansions:

Table (1)
5E, 6E, and 7E Learning Cycles

phases	5E Learning Cycle	6E Learning Cycle	7E Learning Cycle
1	Engage	Engage	Elicited
2	Explore	Explore	Engage
3	Explain	Explain	Explore
4	Elaborate	Engage (extend or elaborate)	Explain
5	Evaluate	Enrich	Elaborate
6		Evaluate	Evaluate
7			Extend

Elicited

In the first phase of this instructional model the main aim is to emerge past experiences and background knowledge about learning and create a strong background for other following phases. This happens when students start to relate new issues and topics with the oldies to support their thinking abilities. Thus, students should learn how to keep reviving old knowledge and learning experiences (Yenilmez & Ersoy, 2008, p. 50).

Engage

In the second phase of the 7E model (engage), learners rely on their abilities to take initiative in learning, construct understanding, self-

advocate and engage with their peers through limited immediate feedback and active individual or collective engagement (Rappel, 2017, p.6). Instructors can get students mentally engaged in the concept or the topic through asking questions or showing videos related to authentic real life situations, problems or events. In this stage also, it is the instructor's role to identify students' background knowledge related to the topic or the concept as well as raise students' attention, interest and curiosity. According to Kearsley and Shneiderman (1998, p. 20) engagement means to get learners intrinsically motivated to participate in active cognitive-based practices and activities as, problem-solving, decision-making ,creating , reasoning and evaluating. Engagement theory is based on preparing collaborative work teams that work on various projects focusing on three main principles: relate, create and donate. The first principle (the relate component) mainly focuses in peer and content interaction through (1) exchanging thoughts, viewpoints and ideas among learners, (2) helping students learn from different experiences and backgrounds, (3) allowing students to clarify and verbalize their problems to facilitate available solutions. The second principle (the create component) emphasizes creating a creative learning context by encouraging students apply their thoughts and ideas in conducting their projects in interesting ways. The third principle (the donate component) gives students opportunities to relate their learning materials to authentic and real contexts through interaction.

In the same context, Hossan (2017) has clarified three other principles of engagement: authenticity, interest as well as social interaction and communication. The first principle (authenticity) can be achieved by instructors through applying meaning-based tasks and activities that are relevant to students' backgrounds and experiences. The second principle (interest) takes place when students manage to relate their learning practices and tasks to their areas of interest. The third principle (social interaction and communication) is a major component of the engagement phase as students become intrinsically motivated to participate in knowledge construction by being engaged in problem-centric learning activities implemented in active learning environments to promote oral and written communication. Yenilmez and Ersoy (2008, p. 50) have provided some typical activities that suit this phase as: mind storming in adverse cases, defining problems and asking questions.

Explore

In the third phase, comes students' time to actively explore their environment and available resources as well as materials related to the topic or the concept. This phase is based on the expeditionary learning model of school reform (Cross, 2004). In this phase instructors can help learners combine rigorous academic content and real world situations as well as projects called "learning expeditions". Learning expeditions are in-depth research on certain topics and issues through long-term investigations that depend on relating academic content to community service and authentic situations (Ikpeze, 2013, p. 59). Activities presented in the exploration phase should be personalized, concrete and practical to help instructors reveal students' misconceptions, knowledge and skills. These activities should reflect the ten essential principles of expeditionary learning which are: collaboration and competition, service and compassion, taking responsibility for learning, primacy of self-discovery, the having of Wonderful Ideas that promotes curiosity and experiment, empathy and caring, success and failure, diversity and inclusion, solitude and reflection and the natural world (cousins, 2000). During this phase the instructor should monitor students' progress and interaction, encourage group work without direct instruction and provide advises.

In this phase, students work with different learning resources that are provided in different learning formats (technology-based and/or regular). They develop their capabilities to gain extra knowledge and skills related to the information and concepts presented in the course topics. Through exploring and discovering students learn how to tackle complicated problems and challenges in a systematic way; they learn how to build logical relations between available learning resources and how to benefit from these relations on their own ways based on their interests, paces and attitudes. Besides, they become encouraged to handle affective learning aspects (motivation, anxiety etc.) in the best ways. Instructors should start by providing students with a problem documented in one learning resource. Then, students should begin exploring other learning resources related to the given problem through preparing one set of related variables and examples from other resources. Each student should have at least one learning resource (e.g. problem) in this phase. Students' performance in tracing other resources related to a guided resource of a given problem, can eventually help instructors adjust the course materials based on students' predicted performances. By the end of each activity,

students' sequenced performance in dealing with resource types and materials should be analyzed, mapped and shared by the instructors (Sahebi & Brusilovsky, 2018, p. 89).

Explain

The fourth phase (explain) is usually guided by the instructor. In this phase, learners should explain what they have understood after exploring. Various learning materials can be applied in this phase as: videos, films, educational apps or software and oral presentations. In this phase, students should learn how to give alternative answers to the questions of the topic through developing new thoughts and ideas. Students gradually develop new thoughts after getting involved in observations during the explore phase. Consequently, students develop their abilities to add and explain new explored concepts and issues (Yenilmez & Ersoy, 2008, p. 50).

Elaborate

The fifth phase is the (elaborate) phase, in this phase instructors should help students develop clear, deeper and appropriate understanding of the given topics and concepts by providing them with suitable data and information, skills and learning experiences. To enhance deepening and elaboration, paper-based handouts and materials, electronic databases, and experiments should be used at this stage to help students get immediate feedback. Students should think in-depth on topics and concepts they have learnt and apply them in different contexts. According to Eisenkraft (2003), this phase is directly related to the psychological construct called transfer of learning.

Evaluate

The sixth phase is (evaluate). It mainly focuses on diagnosing both strengths and weaknesses and taking remedial steps and actions when needed (Tshabalala & Ncube, 2014). Several evaluation techniques as: open-ended questions, performance-based questions, projects, portfolios, observation checklist, interviews, diaries and evaluation scales are applied to nourish learning and teaching and help instructors obtain feedback from students to restructure the instruction based on their feedback (Kilink, 2019). In addition to the previously mentioned evaluation techniques, the researcher has applied automated writing evaluation (AWE). AWE is a computer-based system that provides digital scores and feedback on learners' writing drafts and it has been originated as indicated by Cotos (2014) from Automated Essay Scoring

(AES). It is also called Automated Essay Scoring (AES) and Automated Essay Evaluation (AEE) (Parra & Calero, 2019, p. 209). When learners submit their writings to AWE systems, they receive scores based on (6-point scale). Then, they are provided with improvement suggestions to overcome their writing weaknesses (Roscoe, Jacovina, Allen, Johnson, & McNamara, 2016). In the current research, one free AWE tool, Grammarly (available at <https://grammarly.org/dist/#/overview>), was used. The researcher has selected this tool due to its ease to access without any obstacles or restrictions. Students were simply asked to write their final drafts in word-processing program, copy and upload it to be automatically corrected by the AWE tool.

AWE systems support learners progression as it increases their motivation towards learning English (Shim, 2013), provides immediate feedback in word and sentence usage, grammar as well as spelling in a way that enhances high-levels of writing quality (Wang, Shang & Briody, 2013; Wilson & Czik,2016). In this phase students at the beginning are motivated to assess their own understanding and abilities through applying AWE tool, then instructors evaluate students' progression and achievement of learning objectives through using (Bybee et al., 2006; Secer & Yucel-Toy, 2020). Despite the potential of AWE systems to provide support and systematic facilitation for writing instruction, it is not widely adopted by neither instructors in writing classes nor instructional institutions. It has been added by Matsumura, Wang, Correnti and Litman (2020) that AWE systems have seven ways that can best assist instructors in their writing classes. These seven ways are:

1. Provide timely feedback: AWE systems have proved to be time savers in helping students revising their written prose and first drafts while they are still fresh in their minds. Besides, they provide students with immediate formative feedbacks more quickly than instructors' comments and handouts.
2. Allow an active role for instructors: AWE and e-revise systems offer a helpful approach for instructors through relieving the burden of giving feedback for each student. Instructors hence are provided by much time to provide assistance for students who cannot understand or interpret the electronic feedback messages. In AWE systems, instructors can monitor and guide students' progression.

3. Align with state and district standards: AWE and e-revise systems provide students with formative feedback messages about what good academic writing is.
4. Be compatible with multiple source texts: to be flexible in meeting writing standards, AWE and e-revise systems have various prompts and source texts.
5. Point students to the parts of their essays that need revision: AWE and e-revise systems circle or underline parts or sections in students' written prose that need improvements or provide comments in the margins close to the sections that need to be revised.
6. Mark success: besides providing suggestions for required improvements, AWE and e-revise systems would ideally provide immediate positive feedback through providing comments on how a student has successfully met the writing goals.
7. Provide dashboard to monitor student progress: Instructors can keep graphical display on students' feedback messages to trace their progression.

Extend

The extend phase is actually developed to remind instructors that evaluation is not the end of the process and to clarify the importance for students to practice and apply the new material in new educational situations (Eisenkraft, 2003).

Core values of the 7E instructional model for students and instructors

7E is a student-centered constructivism based model that can change regular instruction by motivating students to explore and monitor their own progress. It can (1) help instructors make good use of students' former or background knowledge and relate it to the new learning material (2) train students construct new knowledge by relating it to their prior knowledge, (3) offer greater benefits regarding stronger student interest in learning and greater ability for scientific inquiry, (3) enhance students' academic achievement and learning abilities, (4) stimulate students to remember previously learnt concepts, and (5) provide students with opportunities to search, find, think and explain examples (Hu, Gao & Liu, 2017; Fitri & Nur, 2018). Recently, some studies have tried to investigate the importance and effectiveness of 5E, 6E and 7E instructional models in various educational environments.

In their study, Francis and Mabel (2015) have investigated the effectiveness of 7E learning cycle model, which is based on constructivist theory and case-based learning (CBL), on students' achievement and attitude towards chemistry. The findings of the study illustrated that students performed and achieved better in chemistry and their attitudes towards chemistry were positively enhanced after applying 7E instructional learning cycle. Keely (2017) examined using the 5E instructional model to promote formative assessment throughout the stages of instruction. This study has illuminated how formative assessment classroom techniques can be successfully linked to each stage of the 5E model stages. Sarac and Tarhan (2017) investigated the effect of the multimedia learning instructional materials prepared according to the 7E learning model on the students' academic success. The findings of the study revealed that the material prepared according to the multimedia supported 7E model has positively influenced the students' academic achievement.

Serkan et al. (2018) introduced a sample 5E learning model for middle school pupils at the ages of 10-12 in science laboratory with an augmented reality microscope MicrosAR to examine microscopic organisms through applying inquiry-based learning tasks to help students being engaged in daily life examples and situations. Besides, Bybee (2019) investigated applying the 5E instructional model developed by BCSC to introduce stem disciplines to overcome the challenging that encounter instructors in introducing educational activities, programs and initiatives of science, technology, engineering and mathematics.

According to Garderen et al., (2020) 5E model focuses on the hybrid formats of learning that can help learners positively develop their learning abilities as well as managing their workloads. This hybrid feature of the 5E model and its two expansions have the ability to deepen students' engagement in the learning materials and enhance their understanding of core concepts by involving them in active and inquiry-based learning environments. In the same context, these instructional models consolidate students' systematic and exploratory ways of learning an as a results students become more involved in learning by doing and self-learning environments rather than being only passive receivers of knowledge. Another core value related to the implementation of these models in the educational process in general and ESP classes in particular is that they have proved to be able to promote and develop

reflective thinking skills on educational learning and practices as they allow learners progressively evaluate the knowledge they acquire by getting involved in formative assessment formats, self-correction opportunities, peers' feedback and instructors' assessment.

Moreover, Gillies and Rafter (2020) have reported on how instructors used various visual, embodied, and language representations to capture learners' engagement and attention in the inquiry-based tasks related to the application of the 5E model in science topics. The study results provided relevant insights into how science instructors used various language strategies along with visual representations to develop complex understanding of science topics. Ong et al., (2020) aimed to determine the effectiveness of a professional development program using a STEM-based 5E Inquiry Learning Model in developing learning of STEM-based inquiry learning model among science teachers. The participants of the study were 78 pre-service science teachers. The findings of this study revealed that the 5E model was effective regarding three overarching key themes: Enhancing knowledge on the content used, empowering pedagogical skills on STEM-based inquiry learning, and heightening classroom management skill on promoting collaboration in the classroom.

Dearth studies, as far as the researcher knows, have applied the 7E model in university classes to develop language skills among EFL, ESL, EGP, EAP, or ESP students. For instance, a study conducted by Secer and Yucel-Toy (2020) was investigate the impact of the 5E Learning Model in an essay writing course designed to promote achievement level of 12th grade high school students in essay Writing. The study was a case study with mixed method in which both qualitative and quantitative data collection procedures. The study instruments were achievement tests, peer feedback form, students' progress check form, and teacher performance observation form. Based on the results of the study it can be impeded that the implementation of 5E Learning Model in EFL essay writing courses has a positive effect on the achievement level of students in essay writing. To sum up, the advantages of implementing the 7E model for ESP students are:

Advantages of 7E instructional model for ESP students

1. Improving Academic writing skills
2. Enhancing self-learning abilities
3. Enhancing attention, engagement and motivation

4. Promoting reflective thinking skills
5. Deepening learning by doing abilities
6. Consolidating inquiry-based and situated learning environments
7. Getting various types of feedback
8. Learning according to paces and fields of interest.
9. Advantages of 7E instructional model for ESP instructors
10. Relating students' background knowledge with the new learning materials.
11. Using various teaching platforms (hybrid- inquiry-based)
12. Managing workloads.
13. Providing guidance, knowledge and progressive assessment.
14. Applying various effective teaching aids that facilitate the learning cycle
15. Having clear instructions and lesson plans
16. Managing learning and teaching timing
17. Creating active learning environments by promoting group work
18. Using up to date learning materials related to daily life situations and global issues.

Based on what has been extrapolated from previous related studies, it can be concluded that this model has proven great effectiveness in the field of science education with its various branches (nursing, mathematics, physics or engineering), as the discovery promotes the acquisition of complex scientific concepts. However, there is a dearth of studies that have dealt with the activation and application of the 7E model in language classes. The current research was an attempt to benefit from the suggestions and recommendations of previous studies by activating this pivotal model in developing academic writing skills among ESP university students. Despite, the absence of specific academic writing courses for both under and postgraduate students, the current research was an attempt to present an academic writing course that may be useful when applied and legalized for ESP students of English scientific departments at faculties of education.

Context of the problem

Success at university level relies heavily on some basic existing pre-entry university attributes as, achieving mastery of academic writing skills. Despite the importance of academic writing skills for students' academic success, instructors and university professors generally take academic writing skills for granted. They usually presuppose that

university students have already acquired these skills during their previous educational levels. Thus, they rarely teach them, which results in learners' lack of academic writing skills (Hermida, 2009, p. 20). In the light of the researcher's experience in teaching for university students and the review of related studies (e.g. Abbadi, 2013; Al Zahrani, 2014; Alqiaw, 2015; Ali, 2016; Zakareya, 2020) it was noted that teaching academic writing skills in various courses of university levels seems far from satisfactory. EFL and ESP university students are still passive learners who cannot convince readers of their opinions nor illuminate relations between thinking and writing.

To document the research problem, the researcher has conducted a pilot study that consisted of three parts. The first part of the pilot study was an academic writing test that was applied to twenty five, second year ESP students enrolled in (Chemistry, Biology and Science in English sections) at Faculty of Education, University of Sadat City. The results of the academic writing test have revealed that about 89% of the students face serious difficulties in the academic writing skills. They could not avoid using jargons, first person perspectives, spelling mistakes and abbreviations. Moreover, they were totally incapable of using appropriate in-text and reference page citations to avoid plagiarism. In addition, they showed problems in content and language skills.

The second part of the pilot study consisted of two needs analysis questionnaires (Appendix one) adopted from (Ali, 2007). The first one was a students' needs analysis questionnaire that was applied to twenty five, second year ESP students enrolled in (Chemistry, Biology and Science in English sections) at Faculty of Education, University of Sadat City. This questionnaire aimed at probing the students' opinions about academic writing skills. The second questionnaire was an instructors' needs analysis questionnaire that was conducted among five instructors to get an insight in their beliefs and opinions about academic writing skills. The students' questionnaire was prepared in a multi-option question form and aimed to gather information from students through corresponding to the following questions:

- Why do you need to study academic writing skills?
- When do you use academic writing skills?
- Would you like academic writing to be taken as an undergraduate course?

- Do students in your class face difficulties in writing tasks because of their poor academic writing skills?
- What are the roles do you like your teacher to have?
- What type of learning activities do you prefer?

The instructors' questionnaire consisted of three scaled questions that aimed to collect information about the following questions:

- Do you agree that academic writing should be included within taken undergraduate ESP courses?
- Do you agree that ESP university students are good at academic writing skills?
- Do you agree that teacher-centered regular instruction is less effective than student oriented one?

After analyzing the responses of the two questionnaires, the researcher came to the following results:

Students' needs analysis questionnaire

Students' responses on the first question (why do you need to study academic writing skills?) showed that a majority of them (about 71%) have considered higher education needs as their main reason for studying academic writing. Regarding the second question (when do you use academic writing skills?), about 65% of them have indicated that they have to apply proper academic writing skills when studying in various courses, while 31% of them have responded that they need academic writing skills for completing research assignments related to their majors. The third question (would you like academic writing to be taken as an undergraduate course?) aimed to elicit students' opinions about having an undergraduate course entitled academic writing for enriching and enhancing their academic writing skills. About, 83% of the students have clarified that they strongly agree that academic writing is so necessary to be included as an undergraduate course.

The fourth question (do students in your class face difficulties in writing tasks because of their poor academic writing skills?) has focused on finding out whether ESP students at faculty of education face difficulties in writing tasks because of their poor academic writing skills. In their responses to the question, about 85% of the students have illustrated that their poor academic writing skills negatively affect their achievement and progress in writing different tasks and activities. The fifth question of the questionnaire (what are the roles do you like your instructor to have?) aimed to investigate the possible preferred roles of

instructors in future academic writing courses from students' perspectives. About 83% of the students have emphasized that they prefer their instructors to be monitors, advisers, personal guides, and facilitators rather than representing the whole authority and the only source of knowledge. Finally, in their response to the sixth question (what type of learning activities do you prefer?), the majority of the students (about 89%) have pointed out that they prefer the incorporation of technology-based activities in their future academic writing courses.

Instructors' needs analysis questionnaire

After analyzing the instructors' responses to the needs analysis questionnaire, the researcher came to the following conclusions:

- The majority of instructors (about 96%) have emphasized that ESP students at Faculty of Education, University of Sadat City are poor at academic writing skills.
- About 98% of them have strongly agreed on including academic writing courses within ESP undergraduate courses at faculty of education.
- About 66% of the instructors have agreed that teacher-centered instructional models and approaches are less effective than student-oriented ones.

Therefore, there is an urgent need for utilizing effective instructional models and approaches among ESP students at Faculty of Education, University of Sadat City to develop their academic writing skills.

Statement of the problem

The problem of this research was the weakness and poor level of Faculty of Education, second year ESP students in academic writing skills.

Research questions

The current research was an attempt to answer the following questions:

1. What are the required academic writing skills for Faculty of Education, second year ESP students?
2. What is the level of Faculty of Education, second year ESP students in academic writing skills?
3. What are the features of a suggested program based on the 7E instructional model and AWE systems?
4. How far does the suggested program based on the 7E instructional model and AWE systems affect the development of Faculty of Education, second year ESP students in academic writing skills?

Research hypotheses

This research aimed at testing the following main hypothesis:

1. There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in the overall academic writing test on the pre- and post- application of the academic writing test in favor of the post-application. The first hypothesis has the following sub-hypotheses:
 1. A There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in writing in a formal style and manner aspect on the pre- and post- application of the academic writing test in favor of the post-application.
 1. B There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in the organization aspect on the pre- and post- application of the academic writing test in favor of the post-application.
 1. C There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in content and language aspect on the pre- and post- application of the academic writing test in favor of the post-application.
 1. D There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in mechanics aspect on the pre- and post- application of the academic writing test in favor of the post-application.
 1. E There is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in conducting good research skills aspect on the pre- and post- application of the academic writing test in favor of the post-application.

Method

This section of the research dealt with a presentation of its methodology steps and components. It includes research design, participants, instrument, materials, variables and procedures.

Participants of the research

The participants of the current research comprised 30 male and female ESP students. They were chosen randomly from second year ESP students, enrolled in Chemistry, Biology and Science in English sections, Faculty of Education, University of Sadat City, during the first semester of the 2020-2021 academic year. The participants' age ranged from 18 to 19 years old and they have learnt English for at least 14 years.

Design and variables of the research

The current research is a pre-posttest experimental research. The only one experimental group was used that was tested before and after conducting the suggested program. The independent variable of the research is a suggested program based on the 7E instructional model and the AWE systems whereas; the dependent variable is academic writing skills. Operational definitions for the research variables are listed below.

- **7E instructional model**

7E is a student-oriented instructional model that focuses on the planned sequence of instruction. It consists of seven main phases: (1) elicited, (2) engage, (3) explore, (4) explain, (5) elaborate (6) evaluate, and (7) extend. This instructional model allows faculty of education, second year ESP students master the required competencies that enhance their progression through exploring, practicing active learning activities, applying various evaluation techniques, as well as being involved in cognitive processes as organization and assimilation.

- **Automated writing evaluation**

Automated writing evaluation (AWE) is a computer-based machine scoring technology that enables faculty of education, second year ESP students to evaluate their first written drafts through getting immediate formative feedback messages to help them correct mistakes, add examples and details as well as provide interpretation and explanation to support their claims from various formal resources.

- **Academic writing skills**

Academic writing skills are ESP faculty of education students' abilities to write well planned, focused, clear, structured, concise, backup with evidence and formal in style various writing pieces.

- **ESP students**

ESP students are faculty of education students, at scientific departments in English (Chemistry-Biology-Science), whose major academic focus is not on the English language.

Research Materials and Instruments

In order to conduct this research, the researcher prepared and used the following materials and instruments:

- An ESP academic writing checklist.
- An ESP academic writing test with a rating scale.

- The suggested program based on the 7E instructional model and AWE systems.
- A teacher's guide.

Implementation

The recent internationalization needs and requirements of English language teaching have led to the change in teaching methods and approaches. Accordingly, regular writing instruction has been replaced by innovative models and methods (Ucara & Yazicib, 2016, p. 227). As indicated by Weideman (2018, p. 10), university students should be able to use academic language to fulfill their study. Writing is considered an essential part of academic literacy that starts when students gather academic information (through speaking with others, reading up, listening or even writing), process that academic information (by thinking how to present or write it up), and finally produce it in a proper form. Since there are no academic writing courses for ESP faculty of education students, the researcher has designed a suggested program based on the 7E instructional model and the AWE systems (Appendix five) to develop faculty of education, second year ESP students' academic writing skills. It was an intensive teaching program for ESP learners at English scientific departments (Biology-Chemistry-Science) at Faculty of Education, University of Sadat City. The program was taken for seven weeks (two sessions per week). Each session of the program presented a specific academic writing sub-skill and the time allocated for each session was 120 minutes. Before implementing the program, the ESP academic writing test was applied to the research participants (N=30) at the beginning of the first semester of the academic year 2020/2021. The aim of this program was to assist ESP students develop some academic writing skills in order to complete their needs and necessities. By the end of the program, the participants were post tested to measure their progress in academic writing skills.

Procedures

At first, a pilot study that consisted of an academic writing test and two needs analysis questionnaires were prepared and applied to some ESP students and instructors to determine the needs and the gap between their current situation and the target situation. Then, the researcher has reviewed recent literature related to academic writing skills (e.g., Al-Mansour, 2015; AlHashemi, AlSubaeie & Shukri, 2017; Zakareya, 2020) in order to determine the academic writing skills. After reviewing recent

literature, the researcher prepared a checklist of twenty two academic writing skills. Having presenting the checklist to a panel of reviewers to determine the most appropriate academic writing skills for second year, ESP faculty of education students, only thirteen sub-skills were approved and classified into five main aspects.

The first aspect was writing in formal style and manner. Three skills were included: (1) avoiding jargon, slang and abbreviations, (2) using third-person rather than first-person perspectives, and (3) making precise word choice. The second aspect was organization. Two sub-skills were included in the second aspect: (1) leaving spaces between words and (2) including an introduction, a body and a conclusion. The third aspect was content and language and it included three sub-skills: (1) writing coherent paragraphs, (2) employing relevant sentences and, (3) applying correct grammatical rules. The fourth aspect was mechanics. It included three sub-skills: (1) utilizing correct punctuation marks, (2) eluding spelling mistakes, and (3) applying correct word order. The fifth aspect was conducting good research skills. It included two sub-skills: (1) manipulating appropriate formats of in-text citation, and (2) applying an appropriate reference page form of citation. After setting the checklist in its final form, the ESP academic writing test was prepared and one hundred marks were divided among the academic writing five main aspects with their thirteen sub-skills.

Then, participants of the research were pre-tested using the ESP academic writing test in order to measure their level in academic writing skills before the implementation of the suggested program. After that, the suggested program based on the 7E instructional model and the AWE systems was applied on the research participants. The suggested program consisted of 14 sessions with time allocation (120) minutes for each session. The first session was an orientation session where the participants of the research were introduced to the 7E instructional model, the AWE systems and the academic writing skills. The rest of the sessions were devoted to develop ESP faculty of Education students' academic writing skills. At the beginning of each session the learning objectives should be stated clearly. Then, according to the theoretical principles of the 7E instructional model, the phases of the 7E instructional model were followed in sequence in each session. The following figure illustrates the phases of the suggested program based on 7E instructional model and AWE systems:

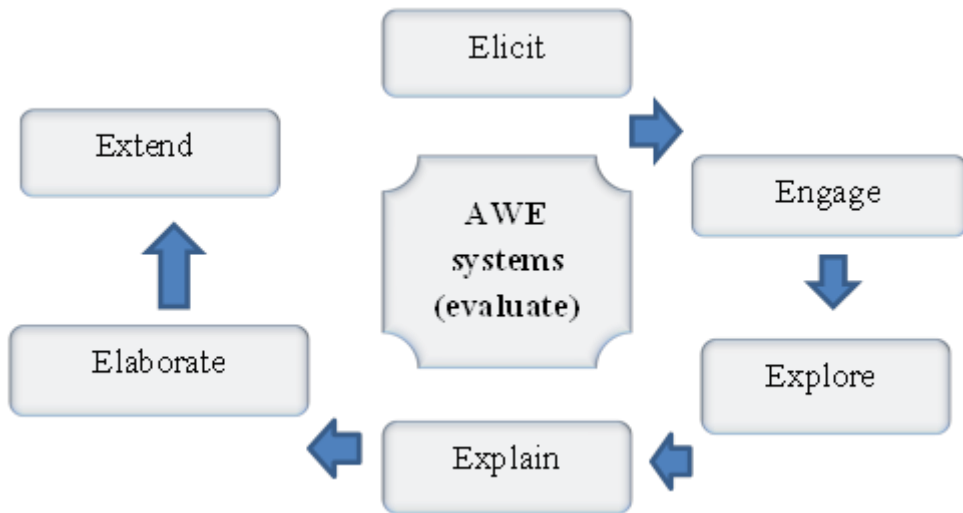


Figure 1: the phases of the suggested program based on the 7E instructional model and the AWE systems

Elicit

In the first phase, the instructor starts by asking ESP students general questions about daily life topics related to their majors as (can bottled water go bad?) trying to emerge ESP students' background knowledge about this topic. During this phase, the instructor focuses on collecting data about what ESP students know about a certain topic. Within this phase, the researcher has applied various types of quizzes, MCQs, post-it notes, brainstorming techniques etc. This phase is crucial to deal with students' misconceptions and test their previous knowledge.

Engage

In the "engage phase, the instructor should engage ESP students' curiosity and interest by encouraging them to put into practice what they have learned previously during in-class or out of class activities. The researcher kept reminding the participants of the importance of applying what they have learnt before in their writing tasks. In this phase, the instructor should warm ESP students up by presenting writing materials about daily life topics as the previously mentioned example (can bottled water go bad), found in articles or in social media resources. It is the stage of using BIG questions and introducing the new material. Then, the instructor should clarify how these writings are following the academic writing sub-skill of the session (e.g. avoiding jargon, slang and abbreviations). At this point, the researcher has focused on shifting ESP students' attention from seeking to understand the written articles or essays to critically think about the given topics. Critical thinking takes

place when ESP students are directed to formulate personal opinions on the presented written materials. Accordingly, ESP students will spontaneously relate the academic writing sub-skill writing of the session (avoiding jargon, slang and abbreviations) to presented article to compare them in light of the acquired skill. Thus, they will be motivated to form personal views and insights that can help them write smoothly on similar topics. Besides, ESP students will be able to apply academic writing features and aspects in their writings. At the end of the "engage" phase, the instructor should present one or more articles about the topic of the session from different sources and for different writers using the internet to meet ESP students' interests and expectations.

Explore

According to the 7E instructional model, ESP students will fall into two learning styles: (1) accommodating learner who learns by searching and discovering and (2) converging learner who learns by thinking and doing. At the beginning of the explore phase, the researcher starts to assign various tasks for ESP students to enhance their learning by searching and discovering abilities. For instance, ESP students are required to access the internet searching about similar articles and essays as those presented in the "engage" stage. Then the students should discuss their brought articles with their peers. This phase focuses on student-student classroom interaction. During students' discussions, the instructor monitors and provides immediate positive feedbacks. Students' discussions allow ESP students' to develop positive and negative insights about the topic of the session that will help them prepare a first draft about the discussed points from different perspectives following academic writing features and aspects.

Explain

The explain phase is the only teacher-centered phase in the suggested program. In this phase, the instructor explains in details the academic writing skill that was previously illustrated within the given written materials. Keeping in mind to illustrate examples about the previously presented academic writing skills and relate them to the new given skill. This phase enhances ESP abilities to build knowledge and concepts.

Elaborate

This is the stage where ESP students are encouraged to write independently in light of the academic aspects and sub-skills illustrated in the explain stage. As ESP students start to create their own writings,

the instructor walks among them to support interaction through exchanging ideas among the instructor and the students as well as provide immediate positive feedbacks. In this phase, ESP students prepare their first drafts on the given topic applying the academic writing sub-skill of the session.

Evaluate

In the evaluate phase, the three types of feedback are included. The first type is peer's correction and it takes place when ESP students are asked to share their writings with their peers. This type of correction is useful for converging students that can learn from the mistakes of their peers before writing their final drafts. The second type of feedback is self-correction. It gives the opportunity for ESP students to find out their own mistakes and techniques for improving them. To achieve an ultimate benefit of the self-correction type of evaluation the researcher has adopted the Grammark an AWE systems tool (available at <https://grammar.org/dist/#/overview>). In the orientation session, the researcher presented a tutorial video about Grammark, illustrating its usage and techniques. The researcher has selected this tool due to its ease to access without any obstacles or restrictions. ESP Students were simply asked to write their first drafts in word-processing program, copy and upload them to be automatically corrected by the AWE tool. This tool as indicated in the homepage helps students with: academic style, transitions, wordiness, grammar traps, run-on sentences and passive voice. On the other hand, Grammark does not help students with: subject-verb agreement, fragment or incomplete sentences, tense shifts, comma splices, apostrophe errors and idiotic ideas.

The researcher has found this AWE tool effective in helping ESP students fill in the self-correction type of evaluation through getting suggested improvements to their first writing drafts without being totally dependent on the tool to improve each single aspect of their writings. Grammark helps ESP students in certain areas but it does not automatically help them with everything related to academic writing features and aspects. This assures their complete progression and academic writing development. After ESP students use Grammark for self-correction and apply the recommended improvements provided by the AWE tool or by their own evaluation, they should start writing their final writings. By the end of this stage, the instructor collects ESP

students' writings and evaluates them using the academic writing rating scale to provide recommendations and feedbacks next session.

Extend

In the "extend" phase, ESP students are encouraged to extend or apply the recently acquired academic writing sub-skills as well as the newly acquired concepts and knowledge in new situations from their own choice.

The ESP academic writing test

The ESP academic writing test was used as a pre-post-test. It consisted of two parts that were developed to measure some academic writing skills (avoiding jargon, slang and abbreviations, using third-person rather than first-person perspectives, making precise word choice, leaving spaces between words, writing, introduction, body and conclusion, writing coherent paragraphs, employing relevant sentences, applying correct grammatical rules, utilizing correct punctuation marks, eluding spelling mistakes, applying correct word order, manipulating appropriate formats of in-text citation, and applying appropriate reference page form of citation). Part one was divided into two questions. While part two consisted of only one question. Time allocated for the test was 60 minutes (40 minutes for part one and 20 minutes for part two).

Test validity

As for test validity, face validity was determined by two TEFL specialists. Moreover, validity of the test internal consistency seeks to determine the value of the correlation between the scores of each of the test items separately and the test as a whole, using the Spearman Brown equation to calculate the correlation coefficient, and the results are shown in the following table:

Table (2)
the values of the correlational validity coefficients for the test items

	Aspect two	Aspect three	Aspect four	Aspect five	The overall test
Aspect one	0.72**	0.68**	0.83**	0.76**	0.87**
Aspect two	---	0.64**	0.79**	0.75**	0.60**
Aspect three	---	---	0.89**	0.93**	0.78**
Aspect four	---	---	---	0.81**	0.73**
Aspect five	---	---	---	---	0.66**

** Significant at (0.01)

As illustrated in the previous table, all the test items are related to the test as a whole, at the level of (0.01), which indicates that the test has a high degree of validity of internal consistency which means that all the test items were in the same context to achieve the main aim of the test.

Test reliability

The coefficient of Cronbach's Alpha was used to determine the reliability of the ESP academic writing test. To calculate the value of the reliability factor for the test, the calculation of the value of the coefficient of Cronbach's Alpha was calculated through using the Statistical Package for Social Sciences (SPSS) program. And the results were shown in the table below:

Table (3)
The reliability of the ESP academic writing test

No.	Aspect	Reliability coefficient value	Sig.
1	Writing in a formal style and manner	0.71	High
2	Organization	0.89	High
3	Content and language	0.81	High
4	Mechanics	0.90	High
5	Conducting good research skills	0.84	High
6	The overall test	0.76	High

Rating scale for correcting the ESP academic writing test (appendix four)

The test was corrected using a rating scale prepared by the researcher to ensure the scoring objectivity. It was conducted to assess the research participants' academic writing skills (avoiding jargon, slang and abbreviations, using third-person rather than first-person perspectives, making precise word choice, writing introduction, body and conclusion, writing coherent paragraphs, employing relevant sentences, and eluding spelling mistakes). The rating scale included items distributed through the ESP academic writing checklist. Each previously mentioned sub-skill was scored on five-point Likert scale basis of a scoring scale from "5" to "1". "5" represented the highest level, while "1" represented the lowest level.

Findings and discussion

In order to answer the current research questions and in light of the quantitative results of the pre-post administration of the ESP academic writing test on the research participants, this section deals with the findings in terms of the research hypotheses.

Findings of hypothesis (1):

The main hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in the overall ESP academic writing test on the pre- and post- administration of the academic writing test in favor of the post-administration." By applying t-test to compare the mean scores of the research participants in the pre- and post-administration of the ESP academic writing test and determining the statistical significance of the difference between them, the results were as shown in the following table (4):

Table (4)
t- test differences between the participants' mean scores in the pre-post administration of ESP academic writing test

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	26.6	4.8	29	41.9	Sig.	0.01
Post-administration		75.4	4.1				

In light of the results of the previous table, it is clear that the calculated t-value of is 41.9 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicate that there is a real difference between the mean scores of the research participants in the pre and post administration of the ESP academic writing test in favor of the post-administration. Accordingly, it was confirmed that the research participants' academic writing skills were developed after the implementation of the program that was based on the 7E instructional model and AWE systems. In addition, the effect size of the program in developing ESP faculty of education, second year ESP students' academic writing skills and the gain ratio for Blake were calculated for the research group in the pre- and post-administration of the ESP academic writing skills as follows:

Table (5)
Effect size and Blake modified gain ratio for the suggested program on the overall ESP academic writing test

Administration	D.F	t- value	η^2 value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	41.9	0.98	Sig.	15.6	large	1.15	Sig.
Post								

Based on the previous results, it becomes clear that the value of the ETA square for the results of the participants of the research group in the pre- and post-administration of the ESP academic writing test exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this indicates the positive effect of the suggested program based on the 7E instructional model and AWE systems on developing ESP academic writing skills. Further, The effect size also reached (15.6), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8), which also indicates the practical and educational significance of the results of the research and the high impact of the independent variables on the development of the dependent variable. Further, Blake modified gain ratio (Hassan, 2011, p. 343) in the previous table was 1.15 exceeding the reference ratio which is (1). This ratio also emphasized the positive effect of the suggested program on developing academic writing skills among faculty of education, second year ESP students. Accordingly, the first hypothesis was verified. The result of the first hypothesis is consistent with the findings of the studies of Abbadi (2013); Al Zahrani (2014); Al-Mansour (2015); Alqiawi (2015); Aberg, Stahle, Engdahl & Knutes-Nyqvist (2016).

Findings of the first sub-hypothesis:

The first sub-hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in writing in a formal style and manner aspect on the pre- and post- administration of the academic writing test in favor of the post-administration. Writing in a formal style and manner aspect reflects faculty of education ESP students' ability to avoid using jargon, slang and abbreviations when writing academically. It also shows their skills to apply the third-person rather than first-person perspective when writing in addition to measuring how ESP students' background knowledge can affect their word choice to write sentences that can cover a certain topic and insight. By applying t-test to compare the mean scores of the research participants in writing in a formal style and manner aspect determining the statistical significance of the difference between them, the results were as shown in the following table:

Table (6)

t- test differences between the participants' mean scores in the pre-post administration of writing in a formal style and manner aspect

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	4.9	1.8	29	16.0	Sig.	0.01
Post-administration		11.3	1.0				

In light of the results of the previous table, it is clear that the calculated t-value of is 16.0 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicate that there is a real difference between the mean scores of the research participants in the pre and post administration in writing in a formal style and manner aspect in favor of the post-administration. Accordingly, it was confirmed that the research participants' writing in a formal style and manner aspect were developed after the implementation of the suggested program that was based on the 7E instructional model and AWE systems. In addition, the effect size of the program in developing ESP faculty of education, second year ESP students' writing in a formal style and manner aspect and the gain ratio for Blake were calculated and presented in the following table:

Table (7)

Effect size and Blake modified gain ratio for the suggested program on writing in a formal style and manner aspect

Administration	D.F	t-value	η ² value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	16.0	0.89	Sig.	5.94	large	1.03	Sig.
Post								

Based on the previous results, it becomes clear that the value of the ETA square for the results of the participants of the research group in the pre- and post-assessment of writing in a formal style and manner aspect, exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this indicates the positive effect of the suggested program based on 7E instructional model and AWE systems on developing the aspect of writing in a formal style and manner. Further, The effect size also reached (5.94), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8),

which also indicates the practical and educational significance of the results of the research and the high impact of the independent variables on the development of the dependent variable. Blake modified gain ratio in the previous table was 1.03 exceeding the reference ratio which is (1). This ratio also emphasized the positive effect of the suggested program on developing the aspect of writing in a formal style and manner among faculty of education, second year ESP students. Accordingly, the first sub-hypothesis was verified.

Findings of the second sub-hypothesis:

The second sub-hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in the organization aspect on the pre- and post-administration of the ESP academic writing test in favor of the post-administration. The organization aspect illustrates ESP students' abilities to leave spaces between words and estimate the suitable length of sentences to form an introduction, a body and a conclusion for their writings. Organization aspect scores are shown in the table below:

Table (8)

t- test differences between the participants' mean scores in the pre-post administration of the organization aspect

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	3.7	1.3	29	11.8	Sig.	0.01
Post-administration		7.3	0.8				

In light of the results of the previous table, it is clear that the calculated t-value of is 11.8 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicate that there is a real difference between the mean scores of the research participants in the pre and post administration in organization skills in favor of the post-administration. Accordingly, it was confirmed that the research participants' academic writing organization aspect was developed after the implementation of the suggested program based on the 7E instructional model and AWE systems. Thus, the second sub-hypothesis is verified. In addition, the effect size of the program on developing ESP faculty of education, second year students' organization aspect and the gain ratio for Blake were calculated and presented in the following table:

Table (9)

Effect size and Blake modified gain ratio for the suggested program on the organization aspect

Administration	D.F	t-value	η ² value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	11.8	0.83	Sig.	4.38	large	1.0	Sig.
Post								

Based on the previous results, it becomes clear that the value of the ETA square for the results of the participants of the research group in the pre- and post-assessment of the organization aspect, exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this indicates the positive effect of the suggested program on developing faculty of education, second year ESP students' organization sub-skills. Further, The effect size also reached (4.38), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8), which also indicates the practical and educational significance of the results of the research and the high impact of the independent variables on the development of the dependent variable. Further, Blake modified gain ratio in the previous table was (1.0). This ratio also emphasized the positive effect of the suggested program on developing the organization aspect among faculty of education, second year ESP students.

Findings of the third sub-hypothesis:

The third sub-hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in content and language aspect on the pre- and post-administration of the ESP academic writing test in favor of the post-administration. The content and language aspect of academic writing focuses on measuring ESP students' abilities to use parallel structure, repetition and transitional expressions to write well unified and coherent paragraphs. In the same way, the content and language aspect of academic writing focuses on ESP students' abilities to avoid writing sentences that do not support the main idea of the topic and committing grammatical mistakes while writing. Scores of the content and language aspect of academic writing are illustrated in table 10:

Table (10)

t- test differences between the participants' mean scores in the pre-post administration of content and language aspect

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	6.1	2.4	29	10.6	Sig.	0.01
Post-administration		14.2	2.5				

The results of the previous table, clarified that the calculated t-value of is 10.6 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicated that there is a real difference between the mean scores of the research participants in the pre- and post- administration in content and language aspect in favor of the post-administration. Thus, it was confirmed that the research participants' content and language aspect was developed after the implementation of the suggested program. Accordingly, the third sub-hypothesis was verified. Besides, the effect size of the suggested program on developing ESP faculty of education, second year students' content and language aspect and the gain ratio for Blake were calculated and illustrated in the following table:

Table (11)

Effect size and Blake modified gain ratio for the suggested program on content and language aspect

Administration	D.F	t- value	η2 value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	10.6	0.79	Sig.	3.94	large	1.0	sig.
Post								

Based on the results in table (11), the value of the ETA square for the results of the participants of the research group in the pre- and post-assessment of the content and language aspect, exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this highly emphasized the positive effect of the suggested program on developing faculty of education, second year ESP students' content and language aspect. The effect size has reached (3.94), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8), which also indicates the practical and educational significance of the results of the research and the high

impact of the independent variables on the development of the dependent variable. Likewise, Blake modified gain ratio in the previous table was (1.0) and was significant. This has indicated that positive effect of the suggested program on developing the content and language aspect among faculty of education, second year ESP students.

Findings of the fourth sub-hypothesis:

The fourth sub-hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in mechanics aspect on the pre- and post-administration of the ESP academic writing test in favor of the post-administration. Mechanics skills are very technical as they are highly related to writing appearance and writing accuracy. They include (utilizing correct punctuation marks and applying correct word order). These sub-skills have been taught to ESP students since the primary stage. Conversely, ESP students were found to frequently ignore these sub-skills when writing. Thus, the researcher kept reminding them of the importance of applying those sub-skills for making effective sentences. By applying t-test to compare the mean scores of the research participants in mechanics skills determining the statistical significance of the difference between them, the results were illustrated in the following table:

Table (12)

t- test differences between the participants' mean scores in the pre-post administration of mechanics aspect

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	6.0	1.7	29	12.2	Sig.	0.01
Post-administration		9.8	1.4				

Table (12) has showed that the calculated t-value of is 12.2 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicated that there is a real difference between the mean scores of the research participants in the pre- and post-administration in mechanics aspect in favor of the post-administration. Thus, it was confirmed that the research participants' mechanics sub-skills were developed after the implementation of the suggested program and the fourth sub-hypothesis was confirmed. Moreover, the effect size of the suggested program on developing ESP faculty of education,

second year students' mechanics skills and the gain ratio for Blake were calculated and illustrated in the following table:

Table (13)

Effect size and Blake modified gain ratio for the suggested program on mechanics aspect

Administration	D.F	t-value	η ² value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	12.2	0.84	Sig.	4.53	large	0.66	Not Sig.
Post								

Based on the results in table (13), the value of the ETA square for the results of the participants of the research group in the pre- and post-assessment of the mechanics skills, exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this highly emphasized the positive effect of the suggested program on developing faculty of education, second year ESP students' mechanics sub-skills. The effect size has reached (3.94), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8), which also indicates the practical and educational significance of the results of the research and the high impact of the independent variables on the development of the dependent variable.

However, Blake modified gain ratio in the previous table was 0.66 and has not exceeded the reference ratio which is (1). Blake modified gain ratio was not significant indicating that there were some extraneous variables rather than the suggested program that have positively affected the development of the mechanics sub-skills (utilizing correct punctuation marks, eluding spelling mistakes, and applying correct word order) among ESP students as:

- Digital technologies (Dhanya & Alamelu, 2019, p. 260).
- Students' different background knowledge.
- Students' self-learning practices.

Findings of the fifth sub-hypothesis:

The fifth sub-hypothesis states that "there is a statistically significant difference ($\alpha \leq 0.01$) level between the mean scores of the research participants in conducting good research skills aspect on the pre- and

post- administration of the ESP academic writing test in favor of the post-administration. Conducting good research skills cannot be separated from academic writing aspects. They represent a milestone in achieving progress in academic writing. In like manner, ESP students need to improve the research skills to be able to complete their research assignments in a proper way. They also need to master these skills to be able to communicate with others in same majors to exchange data and results. Thus, conducting good research skills aspect deals with students' abilities to manipulate appropriate formats of in-text and reference list citation to avoid plagiarism. By applying t-test to compare the mean scores of the research participants in conducting good research skills aspect determining the statistical significance of the difference between them, the results were as shown in the following table:

Table (14)

t- test differences between the participants' mean scores in the pre-post administration of conducting good research skills aspect

Administration	No.	Mean	S.D	D.F	t-value	Sig.	Level of sig.
Pre-administration	30	5.5	1.6	29	43.5	Sig.	0.01
Post-administration		32.7	2.9				

The results of the previous table, clarified that the calculated t-value of is 43.5 exceeding its tabular value of 2.76 at a degree of freedom 29 at a level of statistical significance (0.01), these results indicated that there is a great difference between the mean scores of the research participants in the pre- and post- administration in conducting good research skills in favor of the post-administration. Thus, it was confirmed that the research participants' conducting good research skills were developed after the implementation of the suggested program. Besides, the effect size of the suggested program on developing ESP faculty of education, second year students' conducting good research skills and the gain ratio for Blake were calculated and illustrated in the following table:

Table (15)

Effect size and Blake modified gain ratio for the suggested program on conducting good skills aspect

Administration	D.F	t- value	η2 value		Effect size		Blake modified gain ratio	Sig.
			Value	Sig.	Value	Sig.		
Pre	29	43.5	0.98	Sig.	16.2	large	1.47	Sig.
Post								

Based on the results in table (15), the value of the ETA square for the results of the participants of the research group in the pre- and post-assessment of conducting good research skills, exceeds the value indicating the educational importance of the statistical results in educational and psychological research, which is estimated at (0.15), this vastly emphasized the positive effect of the suggested program on developing faculty of education, second year ESP students' conducting good research skills. The effect size has reached (16.2), which is a large (high) level of influence, as the size of the effect is considered large if its value is greater than or equal to (0.8), which also indicates the practical and educational significance of the results of the research and the high impact of the independent variables on the development of the dependent variable. Besides, Blake modified gain ratio in the previous table was 1.47 and has exceeded the reference ratio which is (1). This ratio has emphasized the positive effect of the suggested program on developing conducting good research skills among the research group. Thus, the fifth sub-hypothesis was verified.

Discussion

Academic writing is essential and a plausible expectation of higher education students. Today's post or undergraduate students in all majors and fields need to be well prepared to effectively share their ideas and findings with various audiences. A number of studies have indicated the importance of academic writing as (Giridharan, 2012; Chittum & Bryant, 2014; Zaki and Yunus, 2015; Kumari, 2016; David, Burns, Danyluk & Ulmer-Krol, 2018; Chitez & Bercuci 2019). This research draws on a suggested program based on 7E instructional model and AWE Systems to develop faculty of education ESP students' academic Writing. This program was undertaken at Faculty of Education, University of Sadat City and was able to pinpoint aspects of academic writing that can be developed among ESP students. The adoption of the 7E instructional model along with the Grammark as an AWE tool has positively affected the academic writing course through including PowerPoint presentations, various activities, different authentic writing topics, hand-outs, some related research papers and a variety of electronic and face to face evaluation methods. The adoption of such methodical procedures and techniques has added value and entertainment to the program and helped ESP students getting engaged in academic writing traditions. The suggested program offers many possibilities and opportunities for ESP

students as a student-oriented program. It helps students learn according to their own paces and interests and be less dependent on their instructors.

The findings of the research indicate that the suggested program had the potential to support: (1) engagement during the initial phase of the program, (2) face-to-face and online monitoring and guidance, (3) collaboration and active participation, (4) authentic and situational learning and (5) electronic and on campus evaluation. Eventually, ESP students have become enthusiastic and active in implementing academic writing tasks. The students have illuminated that they were not able to fulfill neither their research assignments nor their writing tasks before getting involved in the academic writing course. In addition, they have added that they did not know about "plagiarism", various citation formats or "electronic advanced writing techniques" before the course. They explained that they did not actually realize the importance of documenting other works, words, results or even figures and diagrams. Later, the students indicated that they appreciated getting involved in the sequenced systematic phases of the 7E instructional model with its clear steps and directions. Besides, they added that Grammarly was so interesting and it added to their writing abilities and experiences. They were eager to search for other AWE tools to help them improve their writing.

The positive effect of the suggested program is related to six possible indicators. The first indicator is the use of the 7E instructional model that relies on constructivism theory and the student-oriented approach. The second indicator is using online learning formats and tools throughout the implementation of the suggested program so as to engage ESP students in up to date and authentic learning situation. The third indicator is using content-based writing topics related to current global issues and students' fields of interest. The fourth indicator is the incorporation of Grammarly as an advanced writing technique to help ESP students foster their academic writing skills. The fifth indicator is the use of different types of feedback as self-correction (using Grammarly), peer's correction, and instructors' feedback. The final possible indicator is the different teaching and learning environment that has motivated ESP to get rid of their foreign language anxiety and unwillingness to write and turn into active learners.

On the other hand, ESP students at faculty of education were thinking that they would automatically develop their academic writing skills after fulfilling their university courses and the courses actually had little to do with the students' academic writing progress. Even some ESP instructors lacked knowledge in academic writing aspects (Xu & Li, 2018, p. 15). During the implementation of the program some challenges were encountered and the researcher has summarized them as follows. The first was a technical problem related to unstable internet connection that hindered the progression of some sessions. But this problem was handled through applying extra online sessions using Zoom application. Second, at the beginning of the program, some students were not motivated to get involved in academic writing tasks and they showed unwillingness to present and discuss their ideas and drafts in front of their peers or their instructor due to foreign language anxiety, academic stress or little competency. But later and after being used to the steps and techniques of the program, they have indicated that the course has become more enjoyable and different in procedures and techniques than other courses based on regular instruction methods and approaches. Third, some students did not properly use the Grammar tool due to some problems related to inability to use Microsoft word for writing their drafts. In some cases some ESP students were in fact unable to use this program. To solve this problem some tutorials videos about how to use Microsoft word were presented and sent to the students to enhance their writing progression. Finally, irregular or erratic attendance of some students due COVID-19 pandemic has negatively affected students' achievement. But this problem was solved through online Zoom regular meetings.

Conclusions

Academic writing skills are not only essential for ESP and EFL students but also for EFL instructors for achieving academic success. The results of the current research have revealed that ESP students' academic writing skills have been developed to a great extent when they received academic writing instruction based on the integration of 7E instructional model and AWE systems. The development of academic writing skills leads to foster ESP students' personal development, communicative skills and self-esteem. After developing their academic writing skills, ESP students feel motivated to present their original ideas and communicate confidently with other students and experts of their major. The 7E instructional model based on AWE systems program has

boosted ESP students' motivation to write as writing classes have become more enjoyable and flexible to the degree that has reduced ESP students' foreign language anxiety and unwillingness to write. For these reasons, academic writing courses can be integrated within faculty of education ESP undergraduate courses.

Recommendations

In the light of the findings of the research, the researcher recommends that: (1) Faculty of education ESP students must be enrolled in compulsory undergraduate academic writing courses with formalized evaluation structures to be able to fulfill their instructional assignments and research activities and (2) Technology-based tools and applications that include "academic writing techniques" should be included in academic writing courses and ESP students should be well equipped and trained to apply these tools.

Suggestions for further research

The researcher suggests the following implications as potential areas for further research: (1) investigating academic writing in different higher education levels to diagnose both students' and instructors' problems, (2) investigating the effect of applying 7E instructional model on developing other language skills such as speaking and reading (3) investigating the effect of integrating AWE systems on developing other language skills, and (4) investigating the effect of incorporating other instructional models and technology-based systems on developing faculty of education ESP students' academic writing skills.

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