The Effectiveness of ChatGPT Independent Learning in Enhancing Physiotherapy Students' Academic Writing Skills

فاعلية التعلم المستقل باستخدامChatGPT في تطوير مهارات الكتابة الأكاديمية لطلاب العلاج الطبيعي

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ABSTRACT:

Purpose: This paper investigates the effectiveness of ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills English for Physiotherapy course, first year. The aim of this study is to determine the impact of ChatGPT Independent Learning, Egyptian Chinese university Physiotherapy students' in enhancing their academic writing skills. This study was conducted in a quantitative design with many participants, first year physiotherapy students (English for academic purpose).

Methodology: The study used a quantitative approach. a survey, a pre and a posttest were used to collect data.

Findings: The results revealed that ChatGPT Independent Learning was effective for physiotherapy students' (English for academic purpose students) in enhancing their academic writing skills.

Practical implications: ChatGPT Independent Learning was approved for academic writing skills.

Keywords: ChatGPT, Independent Learning, English for academic purposes, academic writing skills

1-Introduction:

Writing is an essential skill to acquire while learning a foreign academic language because it is a necessary skill to be used in both academic and professional lives (Walsh, 2010). Kli mova (2012) summarized the significance of writing skills in her article as writing assists in promoting communication, expanding thinking skills, allowing reflecting, providing feedback, and getting ready for both academic and professional life. According to the previous studies, writing is the most needed skill in English for academic purposes. The researcher investigated that writing skills according to the student needs is the most needed skill to be developed through technology. The association of Artificial Intelligence (AI) and education has attracted researchers. The demand for EAP courses continues to grow in higher education institutions worldwide, educators are exploring innovative ways to support students' language-learning needs. The integration of AI tools like ChatGPT into EAP curricula has the potential to offer learners enhanced opportunities for practice and personalized support which is very beneficial for learners affecting the whole teaching procedure. Chat GPT, became very popular in teaching procedures. Researchers have already explored and acknowledged the affordances of ChatGPT for language learning and teaching. In this context, the study aimed to examine the effectiveness of ChatGPT independent learning as a feedback tool on academic language writing, the study results were promising, indicating that ChatGPT could act as a language learning tool and support the teaching procedure, especially for English for academic purposes students independent learning, to enhance physiotherapy students' academic writing.

2-Literature Review.

2.1.ChatGPT:

The introduction of ChatGPT has triggered significant interest in the field of language education due to its potential to facilitate learning and offer individualized experiences for students. the latest offspring of technology, in education has been investigated by researchers, indicating a wide range of capabilities. In particular, in mathematics, Pardos and Bhandari (2023) explored ChatGPT's effectiveness in producing hints compared to those made by human tutors in algebra. They revealed that both human tutors and ChatGPT had positive learning outcomes, highlighting that only the human tutor-generated hints resulted in statistically significant gains. Simultaneously, Frieder et al. (2023) examined its potential in

mathematical problems, indicating that ChatGPT's math skills are much lower than those of a typical graduate student in mathematics. As an AI language model, broader language uses of ChatGPT have been explored. For instance, Feng et al. (2023) studied ChatGPT as a sentence simplification tool and found that the results were close to the simplified sentences produced by humans. Advances in Mobile Learning Educational Research (SyncSci Publishing 819 of 824 Volume 3 Issue 2, August 30, 2023 Stavros Athanassopoulos, Polyxeni Manoli, Maria Gouvi, et al. Moreover, Jiao et al. (2023)) investigated the ability of ChatGPT to translate. They indicated that it performed similarly to commercial translation products, such as Google Translate, for more widespread European languages but struggled with less widespread ones. They suggested using the source sentence into a more widespread pivot language before translating it into the target language. Mitrovic et al. (2023) probed into the way ChatGPT could answer different questions by using specific patterns and found that it tended to describe experiences rather than express feelings, use uncommon (unusual) words while refraining from using personal pronouns, aggressive and rude language, which are usually attributed to human-generated texts. Furthermore, Zhai (2022) investigated

whether the ChatGPT could write an academic paper, revealing that ChatGPT could assist researchers in academic writing while reducing the time to complete the whole writing process within 2-3 hours. Another line of research (Khalil & Er, 2023) investigated whether essays produced by ChatGPT could be detected for plagiarism through the use of two popular plagiarism detection tools and showed that ChatGPT written productions avoided detection by plagiarism detection software while having a high potential for producing sophisticated text outputs

2.2. ChatGPT and language learning:

Kohnke et al. (2023) discussed its affordances and indicated some uses in language learning by providing examples of learning tasks produced by ChatGPT, such as text production of various genres, text translation, grammar and content correction, vocabulary explanation in multiple ways, production of reading comprehension questions (De La Cruz et al., 2023), which could be used by teachers and learners arguing that AI-driven digital tools, like ChatGPT, are becoming increasingly important in language education. Kim et al. (2023) explored its effectiveness in designing course content based on Task-Based Language Teaching (TBLT). They indicated promising results, suggesting that ChatGPT has the potential to act as a language-learning tool. Yan (2023) examined the use of ChatGPT in an L2 writing practicum, finding that it had the potential to improve efficiency in writing and contribute to L2 writing pedagogy, expressing, at the same time, concerns about threats to academic honesty and educational equity. Hong (2023) explored the potential benefits of ChatGPT for foreign language teachers and the issues and risks associated with its use, arguing that ChatGPT offers significant opportunities for teachers and educational institutions to improve language teaching and assessment (Sholekah et al., 2022). Despite some drawbacks,

mainly focusing on ethical implications, ChatGPT has been seen as a versatile and valuable tool with significant potential to support learners and promote engaging and adaptive language learning. At the same time, simultaneously, researchers encourage language teachers to explore its pedagogical affordances. In English language teaching, learning, and assessment, Nation (2007) describes a framework that outlines the conditions that can ensure meaningful and productive L2 learning. This framework is divided into four strands namely: 1) meaning-focused input; 2) meaning focused output; 3) language-focused learning; and 4) fluency development. The meaning-focused input strand involves learning the language receptively. In this strand, Language learners receive language input (usually through reading and listening). They try to focus on trying to find the meaning of the inputs which must be "comprehensible" or not too hard to understand. In the meaning-focused output strand, L2 learners learn the language productively. They are pushed to produce language (e.g. by speaking, writing, or representing) and focus on getting the message (meaning) across. The language-focused learning strand involves the deliberate learning of language features such as pronunciation, spelling, vocabulary, grammar, and discourse. Language learners focus on using the language accurately. In the fluency development strand, Language learners engage with all four skills of listening, speaking, reading, and writing without too much difficulty. In this strand, the learners are helped to make the best use of what they already know. They focus on using the language more productively without worrying much about accuracy. AI assistance and the cultivation of autonomous writing skills (Shiohira, 2021). Dos Santos et al. (2023) underscore the imperative of guiding learners to perceive AI, like ChatGPT, as a supplementary tool while preserving their agency and creativity in

the writing process. This calibrated approach advocates for incremental skill development and nurtures self–sufficiency in writing. Efficient integration of ChatGPT necessitates the employment of effective educational strategies. Gertenbach (2023) and West (2023) advocate for the deployment of tailored writing prompts, strategically designed to elicit specific language structures and foster engagement. Additionally, they propose a phased release model, enabling learners to transition from AI–assisted writing to autonomous composition. These strategies empower educators to harness ChatGPT effectively within the English for academic purposes. The research exploring the integration of ChatGPT as a writing aid in English for academic purposes potential to significantly enhance writing proficiency, grammatical accuracy, and lexical richness. Striking a delicate equilibrium between AI assistance and the nurturing of autonomous writing skills emerges as a full potential of ChatGPT integration in English for academic purposes and also through adopting independent learning process.

2.3. Independent learning:

The concept of 'independent learning' is associated with, or part of, a number of other educational concepts and wider policy agenda of contemporary relevance such as 'personalized learning', 'student-centered learning' and 'ownership' of learning. It has been seen as one of the essential elements of 'personalized learning' and as vital to the continuing development of a system of education that promotes high quality and lifelong learning and social equity and cohesion. The concept of 'independent learning' is associated with, or part of, a number of other educational concepts and wider policy agenda of contemporary relevance such as 'personalization', 'student-centered learning' and 'ownership' of learning. It is a feature of important issues such as pupil–teacher roles and

relationships and the role of information and communications technology (ICT) in learning. Theoretical study and practical application of the principles of independent learning are perhaps most advanced in the U.S., but the concept is of increasing significance in the UK. It is one of the essential elements of 'personalized learning', and has been seen as vital to the continuing development of a system of school education that promotes high quality and lifelong learning and social equity and cohesion (DfES,2006)

Independent learning is presentedas something of value that is expected to take place at university (North edge, 2005:19; Cottrell: 2003:11; Gow and Kember: 1990) yet recent reports highlight the fact that now undergraduates, 'struggle to cope with the independent and self-directed style of learning

expected by higher education tutors' (Wilde, et al 2006: 2). However, for Knight, 'the implication is misleading. Independence is a goal, not a starting point' (1996: 35). To help students achieve this goal Race (1996) identifies a range of independent learning practices, both formal and informal that could take place specifically at university, but then concedes 'essentially most learning is, when we really think about it, independent learning'. It appears, therefore, that at a time when students in higher education are being criticized for failing to be 'independent' learners (Shepherd, 2006) there is a need to reflect upon the terms of reference and ask what is meant by the term 'independent learning' in the context

of university study.In turning to the discourse of adult education to analyse independent learning there is t he opportunity to draw upon a conceptual tradition in which the role of the educator has always been, 'to facilitate, selfdirected, reflective and critical learning on the part of individual learners' (Jarvis et al, 2003: 90) and a great deal of research has been carried as to how this might be achieved in practice (Brockett & Hiemstra, 1991). In particular, the

literature of adragogy has a proven record of contesting the term 'independent learning', favoring

instead use of the terms 'selfdirected' and autonomous learning (Knowles, 1975, 1984; Boud, 1988)

2.4. English for Academic Purposes and Independent Learning:

English for Academic Purposes (EAP) is a large part and subdivision of English for Specific Purposes (ESP) which includes two dynamic domains, named English for Specific Academic Purposes (ESAP) and English for General Academic Purposes (EGAP). The aim of students in ESAP courses is learning English so that they can work on relevant specific targets such as economics, social sciences and mathematics. On the other hand, in formal education systems, more general academic English skills are specified for EGAP courses. The four English skills and studying skills such as note-taking, asking questions and time managing are contents taught in EGAP courses (Jordan, 1997). As a result, the aim of learning EAP is that students can use English in their professional or academic lives to meet their academic needs in a particular educational context (Gillett & Wray, 2006). Having the ability to read efficiently is necessary for EAP students because second language reading is the most required academic skill. Therefore, students' success in EAP contexts is extremely dependent on what they gain. The aim of EAP practice is to 'enable independence' or nurture 'instruction-independent students' (deChazal, 2014). EAP writing instruction aims to develop autonomous and 'strategic writers who will be equipped to manage their own learning and writing processes beyond their language/writing class' (Ferris, 2018: 89). It is only recently that second language (L2) writing has become 'less about what exactly L2 writing teachers should do for their students and more about how to facilitate learner autonomy' (Belcher, 2013: 438). It is only recently that second language (L2) writing has become 'less about

what exactly L2 writing teachers should do for their students and more about how to facilitate learner autonomy' (Belcher, 2013: 438). The emphasis has been mainly on students' ability to independently manage the academic writing process but not their language learning, need to emphasize autonomy in terms of language development (cf. Little, 2007; Little et al., 2017). Academic Language Learner Autonomy (ALLA) in EAP writing (Kostopoulou, 2020), can be understood as student writers' ability to:

● manage the processes involved in academic writing

● research the written academic discourse of their chosen discipline and shape their texts according to genre and rhetorical expectations

● address their academic language needs and take control of their linguistic development

● develop their metacognitive and metalinguistic awareness to further improve their academic writing and language skills. 'Metacognitive knowledge includes all facts learners acquire about their own cognitive processes as they are applied and used to gain knowledge and acquire skills in varied situations' (Wenden, 1998: 34) (e.g. planning learning, self-monitoring, self- evaluation, self-reinforcement, etc.) Metalinguistic awareness: "the ability to focus attention on language as an object in itself or to think abstractly about language and, consequently, to play with or manipulate language" (Jessner, 2006: 42).

2.5. Independent learning and ChatGPT

Self-regulated learning (SRL) theory AND Independent learning will guide this study]. SRL processes such as goal setting, monitoring for understanding, strategies, and the phases (forethought, performance, and reflection) are used as heuristics to describe AI–student interactions. Although the concept of

'monitoring for understanding' in computer programming behavior has a long history], Many researches has indicated that computer assistance, in general, shows great promise. "Computer-Assisted Learning Systems" can not only support instruction but also the development of self-regulated learning skills.

Ahistorical review of these systems demonstrates a clear progression of capabilities and impact that mirror advances in computing in general and AI in particular. The integration of technology, self-regulated learning and independent learning has been studied extensively in online learning environments with encouraging results. With the dramatic uptick in generative AI tools, researchers have recently begun toconsider design principles to support self-regulated learning broadly. A recent meta-analysis of AI research concluded that there is a need to identify the pedagogical affordances of AI. This work focuses on the capabilities of the most recent and widely used general AI tools, ChatGPT and Google's Bard, to support student learning. In particular, we delineate how these new AI tools can centralize many devices, systems, and processes in one place. Much like how the smartphone has eliminated the need for separate cameras, scanners, and GPS systems, ChatGPT and Bard have effectively consolidated the tools necessary for learning. Chat GPT may not only encourage learners' autonomy but also improve the learning experiences. ChatGPT helps to improve student learning outcomes and learning experiences. Artificial Intelligence uses students' characteristics and needs to provide personalized educational services. It can provide customized learning services for each learner based on characteristics such as the learner's cognitive level, learning style, interests, and learning goals. When the learner's characteristics are unclear or the learning effect is poor, AI can make use of various types of knowledge bases through intelligent algorithms and data analysis to make inferences and provide instant feedback to correct deficiencies and improve

personalized services (Wu Yonghe, Liu Bowen & Ma Xiaoling. (2017). First of all, ChatGPT can customize personalized learning plans and resources for students based on their interests, learning styles, and academic levels. A complete personalized independent learning system should include the following modules: personalized knowledge teaching system, personalized skills training system, comprehensive evaluation system, and personalized learning suggestion system. The system can intelligently push learning resources, target intensive training, guide learners to make learning plans, regulate learners' emotions to reach learning goals and track and evaluate learners' learning effects. (Lin Shule. Development and Design of Personalized Self-Study System Based on Artificial Intelligence Technology, China Educational Technology & Equipmen,2023) Second, it allows students to adapt to different learning rhythms. Different students learn at different paces and in different ways. ChatGPT can adjust the recommended learning resources according to the student's learning pace so that each student can learn at their most comfortable pace, avoiding confusion or a sense of loss caused by a mismatch in learning pace. Finally, it can also help students fill individual knowledge gaps, which can be significant across disciplines and topics. ChatGPT can identify gaps in students' knowledge and recommend supplemental materials targeted to help them fill the gaps in their knowledge and improve their academic achievement Tongtong Ma1(2023),

2.6.Writing Skills

English language is the academics and students at the tertiary institutions, especially at universities. Their needs are now being described in terms of 'English for Academic Purposes'. This category of people uses English to write assignments, reports, and various other writing pieces, all of different nature in English. In other words, they have to read a lot in English and also have to use the language orally at seminars, conferences, in presentations, and

face to face communications like interviews, discussion, etc. Therefore, their requirements are manifold and they cannot be satisfied merely by learning a few numbers of sentences, structures and a certain amount of vocabulary in English. Writing skill are important in English for Specific Purposes(ESP) because they are essential communicative skills in various professional domains (Alshayban, 2022; Risan et al., 2020). Effective and skilled writing enables individuals to convey messages appropriately and efficiently to their intended audience, demonstrates a deep understanding of the topics discussed, and builds a strong professional image (Politton & Hadiyanti, 2019; Tuan, 2010). Kolomiets and friends (2020) emphasize that good writing skill are indispensable in ESP, given the specific and complex demands of written communication in fields such as business, science, engineering, and other professional sectors. Additionally, Klimova (2012) highlight theimportance of writing skill in achieving academic and professional success. In the context of ESP, good writing skill involves organising and conveying information and mastering aspects of language and text structure according to the desired genre and communicative purpose.

2.7.ChatGPT and Writing Skills:

It has been reported that smarter techniques must replace traditional ways to offer personalized dialogic feedback to students (Kohnke et al., 2023). With the proliferation of AI-driven tools such as Grammarly, QuillBot, Copy.ai, WordTune, ChatGPT, and others, it has become easier for students to obtain feedback on their writing (Marzuki et al., 2023; Zhao, 2022). They have advanced automated writing evaluation (AWE) and feedback in writing (Gayed et al., 2022). While the literature on Grammarly as a feedback tool in the writing classroom is well-established (Fitriana & Nurazani, 2022; Koltovskaia, 2020; Thi & Nikolov, 2022) and its positive impact on writing has been investigated empirically (Chang et al., 2021), the

use of AI chatbots like ChatGPT for leveraging feedback in writing classes is a relatively new area and requires further investigation (Barrot, 2023). Since ChatGPT is a large generative language model, its potential to help students with writing is immense. It is more student-friendly and can provide more need- based assistance than other AWE tools, as suggested by Guo et al. (2022) and Rudolph et al. (2023). It can support student writing by providing appropriate directions related to content and organization as they write (Allagui, 2023). Since it can automatically train itself and learn from previous conversations (Chan & Hu, 2023), students can receive tailored feedback suitable for individual needs Like earlier AI chatbots, ChatGPT can be used for generating ideas and brainstorming (Lingard, 2023). Recently, it has been accepted that ChatGPT can make writing easier and faster (Stokel-Walker, 2022). This potential, when exploited by teachers, can be converted into a dependable feedback tool. Wang and Guo (2023) discuss ChatGPT supporting students with learning grammar and vocabulary. As pointed out by Rudolph et al. (2023), irrespective of students' ability to use language accurately to ask questions, ChatGPT can provide feedback and information. In another study by Dai et al. (2023), students received corrective feedback from ChatGPT. Mizumoto and Eguchi (2023) also highlight similar findings when they tried ChatGPT as an AWE tool. In a study conducted in Saudi Arabia, Ali et al. (2023) discuss the positive impact of its use on learners' motivation. It could be due to its ability to provide reliable explanations (Kohnke et al., 2023) without the student having to go through the anxiety of asking the query in a classroom (Su et al., 2023). Since coming into existence in the last part of 2022(OpenAI, 2022), ChatGPT has gained immense popularity among language educators. It has been reported as capable of producing high-quality texts (Gao et al., 2022), offering feedback on text organization, language use and recommending corrections (Ohio University, 2023), logically organizing content, adding appropriate supporting

details and conclusion (Fitria, 2023). While Yan (2023) has reported benefits to students' writing skills through its use, he has also warned that its use can threaten academic honesty and ethicality in writing.

3. Problem identification

3.1. Purpose of the Study:

The purpose of the study was to investigate the ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills English, first year. The aim of this study is to determine the impact of ChatGPT Independent Learning, Egyptian Chinese university Physiotherapy students' in enhancing their academic writing skills.

3.2. Objectives of the Study:

1-Enhancing and promoting first year, physiotherapy students 'academic writing skills.

2-Developing ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills English for, first year.

3.3. Statement of the Problem:

The problem of the present study was that first year at the faculty of the physiotherapy, Egyptian Chinese university are weak in their academic writing skills, so the researcher made an attempt to investigate the effectiveness of ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills English for, first year.

-What is the effectiveness ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills?

This question can be divided into the following sub questions:

1-What are the ChatGPT Independent Learning strategies needed for physiotherapy students 'to foster their academic writing skills?

2-What are the academic writing skills needed for physiotherapy students?

How far do ESP physiotherapy students acquire their academic writing skills?

3-What is the effect of the ChatGPT Independent Learning strategies in fostering the first year, physiotherapy students' academic writing skills?

3.4.Limitations of the Study:

The present research limits first year students', ESP students, Faculty of physiotherapy, Egyptian Chinese University. Students were assigned to two groups randomly; one group was considered as an experimental group and the other one is considered a control group. each group consisted of 100 students.

4.Methodology

4.1.Research Design:

This study was conducted quantitatively to collect data from a large number of participants according to Heale and Twycross (2015), a quantitative research design allows researchers to generalize the findings from vast data. For this current study which includes 100 participants, participants in this current study: ESP students, Faculty of physiotherapy, Egyptian Chinese University. Students were assigned to two groups randomly; one group was considered as an experimental group and the other one is considered as a control group. each group consisted of 100 students.

4.2.Research Tools and Data collection procedures:

Research tools which are used to collect data can be considered as follows:

1-Academic writing Skills Questionnaire. (Appendix 2).

2-Pre-and post-academic writing Skills Test. (Appendix 3).

4.3.Instrument and Experiment:

The study had a pre -post groups design. An experimental and a control group were pre- posttests "pre and post speaking skills test". The experimental group was instructed and trained in an ESP ChatGPT independent learning, while the control group received no such training. Pre academic writing skills questionnaire was used to measure the students' selected writing skills which are needed for their academic life. Pre-post academic writing skills exam is used to measure their writing skills needed for their academic life before and after the experiment.

4.4.Academic writing Skills Questionnaire. :(Appendix 2).

4.4.A The Objective

The questionnaire was designed for the purpose of:

-Surveying the physiotherapy students' needs for the most needed academic writing skills

4.4.B. Design

In order to design the questionnaire, the researcher did the following:

-Reviewing the ESP literature that focused on English for academic purposes ChatGPT independent learning.

-Reviewing the previous studies that already developed the academic writing skills.

4.4.C. Administration

The questionnaire was administrated to the first year, physiotherapy students' Egyptian Chinese university, through

Microsoft teams (online), to be filled calculated online, the researcher explained the purpose of the questionnaire through Microsoft teams.

4.4.D. Description

The questionnaire consists of 25 items representing the target academic writing skills to the English for academic purposes students' according to the previous studies. The students selected the most important needed writing skills in the field of physiotherapy as follows:

Improving sentence structure
Using correct punctuation (e.g., full stops, commas)
Expanding vocabulary and word choice
Writing clear and concise sentences
Organizing ideas logically in an essay
Improving coherence and cohesion in writing
Writing strong topic sentences
Supporting arguments with evidence
Avoiding common grammar mistakes
Writing effective summaries and paraphrasing
Understanding how to self-edit and proofread
Avoiding plagiarism and properly citing sources
Learning how to generate ideas for writing topics
Practicing time management for writing assignments
Using transition words effectively
Learning how to write a strong thesis statement
Developing a compelling introduction
Strengthening conclusion writing skills
Writing engaging narratives and storytelling
Enhancing critical thinking in writing

4.4.E. Validity

The questionnaire was validated by jury members (appendix 1), English language professors and instructors who are specialized in English methodology and ESP COURSE design. Based on the jury members' recommendation, the researcher made the suggested changes and modification to reach to its final form

Validity of the for Academic Writing Skills among Physical Therapy Students:

To ensure the validity of the questionnaire, the researcher presented it to jury of experts form field of curriculum and teaching methods, Appendix No. (1); In order to explore their opinions about the validity of this questionnaire, the researcher asked them to express their opinion on the questionnaire in terms of the suitability of the skills for what they were developed for, and the extent of the students' needs for them, in addition to determining the extent of their suitability to the level of the students of the research sample, and the clarity of its linguistic formulation, as well as adding, deleting, or Reframing what they see as skills.

4.4.F. Reliability of for Academic Writing Skills among Physical Therapy Students:

To verify the reliability of the questionnaire, the researcher used the Cooper equation to calculate the percentage of agreement between the arbitrators. The percentage of agreement between the arbitrators was (90.40%), meaning the reliability value was (0.904); this indicates a high reliability rate.

4.4.G. Results of for Academic Writing Skills among Physical Therapy Students:

The researcher calculated the percentage of agreement among students on the questionnaire. This is to determine the extent of

students' needs for Academic Writing Skills, which is evident in the following table (1):

Table (1)
Percentage of Agreement between students on Needs Analysis Questionnaire for Academic Writing Skills among Physical Therapy Students
(N=100)

No.	Writing Skill	Percentage of Students	Ranking
1	Improving sentence structure	98%	3
2	Using correct punctuation (e.g., full stops, commas)	99%	1
3	Expanding vocabulary and word choice	96%	7
4	Writing clear and concise sentences	96%	8
5	Organizing ideas logically in an essay	96%	9

No.	Writing Skill	Percentage of Students	Ranking
6	Improving coherence and cohesion in writing	91%	16
7	Writing strong topic sentences	90%	18
8	Supporting arguments with evidence	91%	17

No.	Writing Skill	Percentage of Students	Ranking
9	Avoiding common grammar mistakes	98%	4
10	Writing effective summaries and paraphrasing	99%	2
11	Understanding how to self-edit and proofread	97%	5
12	Avoiding plagiarism and properly citing sources	96%	10
13	Learning how to generate ideas for writing topics	95%	12
14	Practicing time management for writing assignments	96%	11
15	Using transition words effectively	97%	6
16	Learning how to write a strong thesis statement	90%	19
17	Developing a compelling introduction	90%	20

No.	Writing Skill	Percentage of Students	Ranking

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المجلد الحادي والثلاثون   العدد مايو ٢٠٢٥م

18	Strengthening conclusion writing skills	92%	14
19	Writing engaging narratives and storytelling	92%	15
20	Enhancing critical thinking in writing	93%	13
21	Understanding paragraph structure	60%	25
22	Avoiding run-on sentences and fragments	65%	23
23	Writing different types of essays (e.g., descriptive, persuasive)	75%	21
24	Using active and passive voice correctly	65%	24
25	Enhancing critical thinking in writing	70%	22

It is clear from the results of the previous table (1) that:

The skills agreed to be needed by students were maintained at a rate of (80.00%) and more, and the following is an explanation of those skills:

- **First Rank:** the skill of Using **correct punctuation (e.g., full stops, commas)** came in first rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (99.0%).

- **Second Rank:** the skill of Writing **effective summaries and paraphrasing** came in Second rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (99.0%).

- **Third Rank:** the skill of Improving **sentence structure** came in Third rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (98.0%).

- **Fourth Rank:** the skill of Avoiding **common grammar mistakes** came in Fourth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (98.0%).

- **Fifth Rank:** the skill of Avoiding **common grammar Understanding how to self-edit and proofread** came in Fifth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (97.0%).

- **Sixth Rank:** the skill of Using **transition words effectively** came in Sixth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (97.0%).

- **Seventh Rank:** the skill of Expanding **vocabulary and word choice** came in Seventh rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (96.0%).

- **Eighth Rank:** the skill of Writing **clear and concise sentences** came in Eighth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (96.0%).

- **Ninth Rank:** the skill of Organizing **ideas logically in an essay** came in Ninth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (96.0%).

- **Tenth Rank:** the skill of Avoiding **plagiarism and properly citing sources** came in Tenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (96.0%).

- **Eleventh Rank:** the skill of Practicing **time management for writing assignments** came in Eleventh rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (96.0%).

- **Twelfth Rank:** the skill of Learning **how to generate ideas for writing topics** came in Twelfth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (95.0%).

- **Thirteenth Rank:** the skill of Enhancing **critical thinking in writing** came in Thirteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (93.0%).

- **Fourteenth Rank:** the skill of Strengthening **conclusion writing skills** came in Fourteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (92.0%).

- **Fifteenth Rank:** the skill of Writing **engaging narratives and storytelling** came in Fifteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (92.0%).

- **Sixteenth Rank:** the skill of Improving **coherence and cohesion in writing** came in Sixteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (91.0%).

- **Seventeenth Rank:** the skill of Supporting **arguments with evidence** came in Seventeenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (91.0%).

- **Eighteenth Rank:** the skill of Writing **strong topic sentences** came in Eighteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (90.0%).

- **Nineteenth Rank:** the skill of Learning **how to write a strong thesis statement** came in Nineteenth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (90.0%).
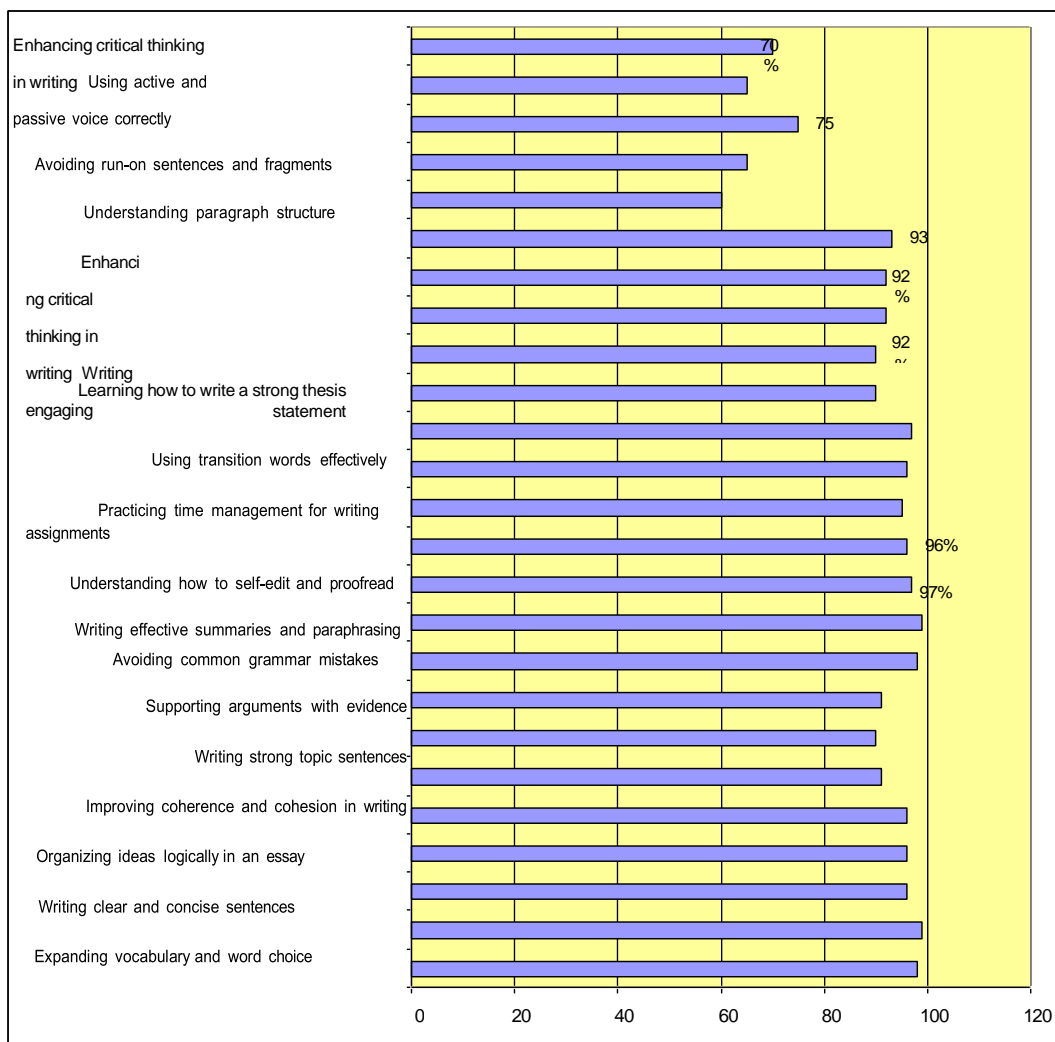
- **Twentieth Rank:** the skill of Developing **a compelling introduction** came in Twentieth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (90.0%).

- **Twenty-first Rank:** the skill of Writing **different types of essays (e.g., descriptive, persuasive)** came in Twenty-first rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (75.0%).

- **Twenty-second Rank:** the skill of Enhancing **critical thinking in writing skills** came in Twenty-second rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (70.0%).

- **Twenty-third Rank:** the skill of **Avoiding run-on sentences and fragments** came in Twenty-third rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (65.0%).

- **Twenty-fourth Rank:** the skill of Using active and passive voice correctly came in Twenty-fourth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (65.0%).

- **Twenty-fifth Rank:** the skill of Understanding paragraph structure came in Twenty-fifth rank in the Questionnaire of Academic Writing Skills among Physical Therapy Students; the percentage of students' agreement on their need for it reached (60.0%).

- **This result can be illustrated by the following figure (1):**

Figure (1)

A graph showing of agreement percentage between students

on needs analysis questionnaire for academic writing skills

Chart categories (top to bottom):
- Enhancing critical thinking in writing Using active and passive voice correctly — 70%
- passive voice correctly — 75
- Avoiding run-on sentences and fragments
- Understanding paragraph structure
- Enhancing critical thinking in writing Writing engaging — 93
- — 92%
- — 92%
- Learning how to write a strong thesis statement
- Using transition words effectively
- Practicing time management for writing assignments
- — 96%
- Understanding how to self-edit and proofread — 97%
- Writing effective summaries and paraphrasing
- Avoiding common grammar mistakes
- Supporting arguments with evidence
- Writing strong topic sentences
- Improving coherence and cohesion in writing
- Organizing ideas logically in an essay
- Writing clear and concise sentences
- Expanding vocabulary and word choice

X-axis: 0 20 40 60 80 100 120

4.5- Pre-and post-academic writing Skills Test. (Appendix 3)

4.5.A The objective:

The Writing test was designed for the purpose of:

-Surveying the physiotherapy students' acquisition *for* their academic writing skills.

٤.٥.B Design:

In order to design the test, the researcher did the following:

-Reviewing the ESP literature that focused on English for academic purposes writing skills test.

-Reviewing the previous studies for designing writing tests that already developed the writing skills for academic purposes.

٤.٦.C validity

The test was validated by jury members (appendix 1), English language professors and instructors who are specialized in English methodology and Esp course design. Based on the jury members' recommendation, the researcher made the suggested changes and modification to reach to its final form.

٤.٦.D. Administration

The test was administrated to the first year (the control and the experimental groups), physiotherapy students, Egyptian Chinese university, pre and post teaching the EAP content for the control group through the normal content and for the experimental group through the new designed ChatGPT independent learning, the researcher explained the purpose of the test, pre -posttest was administrated for both control and experimental groups to calculate the results.

٤.٦.E. Description

The test consisted of writing a detailed essay, incorporating all the selected 20 skills according to the questionnaire. The test was out of 100 marks.

Skill	Max Marks	Details
1. Clear Explanation of Topic	5 marks	Clearly explains the importance of medical terminology for healthcare professionals.

Skill	Max Marks	Details
2. Use of Appropriate Terminology	5 marks	Correct and accurate medical terms are used throughout the writing.
3. Capitalization of Medical Terms	5 marks	All medical terms and proper nouns are correctly capitalized.
4. Sentence Structure and Variety	5 marks	Use of a mix of short and long sentences to create engaging writing.
5. Proper Use of Full Stops	5 marks	Full stops are used correctly at the end of sentences.
6. Introduction of the Topic	5 marks	Strong and clear introduction to the topic, setting the stage for the discussion.
7. Logical Flow of Ideas	5 marks	Ideas and arguments flow logically from one point to the next.
8. Use of Subheadings or Paragraphs	5 marks	Well-organized with appropriate use of subheadings or distinct paragraphs.
9. Relevance of Examples	5 marks	Relevant, well-explained examples are included to support arguments.
10. Correct Use of Commas	5 marks	Commas are correctly placed to separate clauses and enhance the clarity of the writing.
11. Conclusion	5 marks	Effective conclusion summarizing the main points of the essay.
12. Clear Thesis Statement	5 marks	The thesis is clear and outlines the focus of the essay.

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13. Cohesion Between Paragraphs	5 marks	Transitions between paragraphs are smooth and logical.
14. Use of Active Voice	5 marks	Active voice is predominantly used to create clear, direct writing.
15. Use of Correct Verb Tenses	5 marks	Consistent and appropriate use of verb tenses throughout.
16. Avoiding Run- on Sentences	5 marks	Sentences are well-constructed and avoid being too long or run-on.
17. Grammar and Syntax	5 marks	Correct grammar and sentence structure, with proper word order.

Skill	Max Marks	Details
18. Correct Usage of Pronouns	5 marks	Pronouns are used clearly and correctly to avoid confusion.
19. Use of Citations (if needed)	5 marks	Correct citations and references are included, if applicable.
20. Clarity of Expression	5 marks	The writing is clear and straightforward, avoiding overly complex words or phrases.

Psychometric Properties of Academic Writing Skills Test for students in the faculty of Physical Therapy:

The researcher verified the availability of the psychometric Properties (validity, reliability, coefficient of difficulty and ease, discrimination coefficient) of the test as follows:

First: Validity

In this research, the researcher relied on the validity of the jury members to emphasize the validity of the content, also the internal consistency, and Intrinsic Validity, The following is an explanation for this

A. Content validity:

The researcher presented the test in its initial on jury of experts form field of curriculum and teaching methods to express their opinions on the appropriateness of items of the test, Based on the viewpoints agreed upon by the jury members, the researcher has done the modifications agreed upon by the jury of experts (80.00% and more). Cooper's equation has been used to calculate the percentage of agreement among the jury members.

The rate of agreement among the jurors on skills of test ranged between (80.00% - 100.00%), as the percentage of agreement on the test as a whole reached (92.00%), which is a high percentage indicating the validity of the test, after making the modifications approved by the jury members, which included an amendment to the formulation of some of the questions of the test, The researcher made the modifications referred to by the jury members, which included modifying the wording of test.

B. Internal consistency validity:

Internal consistency was calculated through the application of the test on (46) student during the pilot study as follows:

Calculation of the correlation coefficients among the test skills and total test as follows

Table (2)
Correlation coefficients between skills of Academic writing skills test and total test (N=46)

Skills	Correlation Coefficient	Skills	Correlation Coefficient
1	0.400**	11	0.865**
2	0.816**	12	0.407**
3	0.759**	13	0.811**
4	0.830**	14	0.739**
5	0.377**	15	0.850**
6	0.581**	16	0.860**
7	0.446**	17	0.863**
8	0.777**	18	0.780**
9	0.803**	19	0.819**
10	0.825**	20	0.784**

** Correlation is significant at the at level (0.01)

The previous table (2) shows the correlation coefficients between the total test and skills of the test have ranged between (0.377) and (0.865), all of which are a statistically significant at the level of (0.01); this indicates the correlation and coherence of the test skills, and the test as a whole, which indicates that the test It has internal consistency.

C.Intrinsic Validity

Intrinsic validity of the test was also obtained by using the following formula:

$$\text{Intrinsic validity} = \sqrt{\text{Reliability item}}$$

Intrinsic validity = $\sqrt{0.838}$ = 0.915 Intrinsic validity = 0.915

Intrinsic validity equal (0.92); which confirms that the test is validity.

Second: Reliability

The reliability of the test was calculated in a number of ways, the Cronbach's Alpha, and Test-retest, as follows:

A. Cronbach's Alpha: The researcher used this method to calculate the reliability of the test by applying it to a sample of (46) student. The Cronbach's Alpha coefficients for the value of the Cronbach's Alpha for the overall test was (0.838).

Table (3)
Results of the reliability coefficient value For the academic writing skills test

Test	Cronbach's Alpha Coefficient
The test as a whole	0.838

These values indicate that the test has an appropriate degree of reliability.

B. Test-Retest: this study assessed the reliability of academic writing skills test using a test-retest

approach. A pilot sample of (46) students completed the test, and retook it (21) days later. The resulting reliability coefficient (r = 0.901) demonstrated high test reliability.

These values indicate that the test has an appropriate degree of reliability, and this means that the values are appropriate to be reliable and indicate the validity of the test for application.

Third: The Difficulty Coefficient Calculation

The researcher calculated the difficulty coefficient of the skills of test. The following table shows the difficulty coefficient of the skills as follows:

Table (4)
Values of difficulty coefficient of
Academic writing skills test
(N=46)

Skills	Coefficients of difficulty	Skills	Coefficients of difficulty
1	0.51	11	0.48
2	0.50	12	0.52
3	0.52	13	0.50
4	0.47	14	0.51

Skills	Coefficients of difficulty	Skills	Coefficients of difficulty
5	0.49	15	0.50
6	0.50	16	0.53

7	0.55	17	0.50
8	0.51	18	0.49
9	0.49	19	0.48
10	0.47	20	0.50

It is clear from the previous table (4) that the difficulty coefficients ranged between (0.47 - 0.55), which are good difficulty coefficients, and the difficulty coefficient for the test as a whole was (0.50). These results indicate the validity of the test for use.

Fourth: Discrimination Coefficient Calculation

The discrimination is the test's ability to discriminate between the high- ability students and low- ability students. The following table shows the discrimination coefficients of the test:

Table (5)
Values of discrimination coefficients of Academic writing skills test
(N=46)

Skills	Discrimination Coefficients	Skills	Discrimination Coefficients
1	0.68	11	0.72

Skills	Discrimination Coefficients	Skills	Discrimination Coefficients
2	0.71	12	0.70

3	0.72	13	0.66
4	0.60	14	0.67
5	0.65	15	0.69
6	0.69	16	0.64
7	0.65	17	0.68
8	0.59	18	0.66
9	0.63	19	0.70
10	0.66	20	0.70

From the previous table (5) , it is found that the values ranged from (0.59 to 0.72) , which are acceptable values and indicate the ability of the test to distinguish between the students. Then the test became in its final form after the adjustments. The test as a whole discrimination coefficient was (0.67). These results indicate the validity of the test for use.

By verifying the psychometric properties of the academic writing skills test, it was confirmed that the test is reliable for application to the main sample of students from the faculty of physical therapy.

The Statistical Methods:

The Social Sciences Statistical Package SPSS ver.27 was used to perform statistical analyzes, and the methods used in this research are:

- Cooper's equation to find agreement ratios among jurors of experts.

- Cronbach's Alpha, and test-retest to calculate Reliability of the test.

- Intrinsic Validity to calculate Reliability of the test.

- Pearson correlation coefficient to estimate internal consistency of the test.

- The difficulty coefficient calculation, and discrimination coefficient calculation for the test.

- "t-test" for the independent groups to examine the equivalence in academic writing skills test between experimental students' group & control students' group, and its significance was verified by the value of (t).

- "t-test" for the independent groups to examine the significance of the differences between the degrees of students (experimental students' group & control students' group) to determine the difference in the level of the academic writing skills test in both groups, and its significance was verified by the value of (t).

- "t-test" for the paired groups to examine the significance of the differences between the degrees of students (experimental students' group) to determine the difference in the level of the academic writing skills test in pre and post application, and its significance was verified by the value of (t).

- Effect size scale "η^2" to demonstrate the impact of the experimental treatment on academic writing skills test.

- The ratio of Blake to verify of effectiveness.

4.6. Hypotheses of the Study: –

In the light of the results of the theoretical background, the following hypotheses can be stated:

1. There is a statistically significant difference between the mean scores of the experimental and control groups in the post administration of the academic writing skills test favoring the experimental group.

2. There is a statistically significant difference between the mean scores of the experimental group students in the pre and post administrations of academic writing skills test favoring the post administration.

3. ChatGPT independent learning are effect in enhancing physiotherapy students' academic writing skills.

4.7. Results and Discussion

After the research sample was chosen, the actual implementation of the research experiment has started, and this was represented in the following:

Applying the academic writing skills test was prior applied to the research sample students as follows:

● **Pre-test of the academic writing skills test:**

The aim of the prior application of the academic writing skills test is to ensure the equality of the two groups in the level of academic writing skills before teaching. The prior application of the test was done on the students of the experimental and control groups, and the results were monitored and statistically processed using the (t) test for two independent samples.

the value of (t) was calculated for two independent groups and their significance for the difference between the mean scores of

experimental students' group and control students' group in the total degree of the academic writing skills test, and a table (6) shows that:

Table (6)
The value of "t" test and the level of its significance for the difference between experimental group and control group in pre-test of academic writing skills test

Variable	Groups	N	Mean	Std. Deviation	df	T	Sig.
Academic writing skills	Experimental Group	110	28.64	1.179	218	0.661	0.509
	Control Group	110	28.53	1.269			

It is shown from the previous table (6):

- The great Convergence between the mean scores of experimental group students and the mean score of control group students in total of the academic writing skills test, where experimental group students got an mean (28.64) with a standard deviation (1.179), while control group students got an mean (28.53) with a standard deviation (1.269), and the calculated value of (t) for the significance of the difference between the mean scores of experimental group and control group students in total of the academic writing skills test, which reached (0.661) and the significance level is (0.509) which is greater than the level of significance (0.05); Thus, there is no statistically significant difference at the level of significance (0.05) between responses for students of experimental group and

control group in pre- application to total of the academic writing skills test .

- This means that the two groups (experimental & control) are equal in the academic writing skills test as a whole, and this indicates that there is no difference in scores of academic writing skills test as a whole among experimental group and control group in pre-test to the academic writing skills test

- **This result can be illustrated by the following figure (2):**

Figure (2)
A graph showing of mean scores of experimental group
and control group in pre-test to the academic writing skills test

4.7.A. Results

In this section, the researcher presents the results of the study by answering the research questions and testing the validity of each research hypothesis, and then the results are interpreted and

discussed in the light of the theoretical framework for the research and previous studies.

- **First hypothesis of the research**

The first hypothesis Stated that " There is a statistically significant difference between the mean scores of the experimental and control groups in the post administration of the academic writing skills test favoring the experimental group ".

To test the validity of this hypothesis, the (t) test was employed to two independent groups the experimental students group and the control students group in post-test of the academic writing skills test

. The results are shown in the following table (7):

Table (7)
The value of "t" test and the level of its significance for the difference between experimental group and control group in post-test of the academic writing skills test

Variable	Groups	N	Mean	Std. Deviation	df	T	Sig.
Academic writing skills	Experimental Group	110	78.81	1.835	218	232.775	.000
	Control Group	110	29.20	1.276			

**It is shown from the previous table (7):**

- High of mean scores for experimental group students than mean score of control group students in total of the academic writing skills test, where experimental group students got a mean (78.81) with a standard deviation (1.835), while control group students got a mean (29.20) with a standard deviation (1.276). it's mean the average scores of experimental group students was higher than the mean scores of

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control group students in the post-test of total of the academic writing skills test.

- The calculated value of (t) for the significance of the difference between the mean scores of experimental group and control group students in total of the academic writing skills test, which reached (232.775) and the significance level is (0.000) which is lower than the level of significance (0.05); Thus, there is statistically significant difference at the level of significance (0.05) between responses for students of experimental group and control group in post- application to total of the academic writing skills test in favor of experimental group.

- **This result can be illustrated by the following figure (3):**

Figure (3)
A graph showing of mean scores of experimental group and control group in post-test of the academic writing skills test
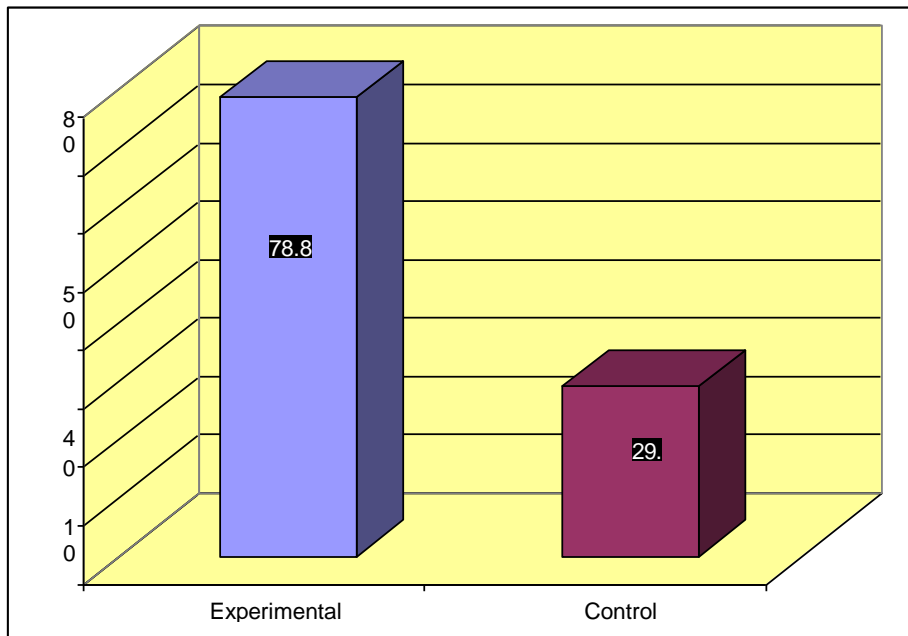
-This means accepting the first hypothesis of research, and this indicates that there is difference at the level of (0.05)

between the experimental and control group in the post- test of the academic writing skills test in favor of experimental group.

- ## The Second hypothesis of the research

The Second hypothesis Stated that " There is a statistically significant difference between the mean scores of the experimental group students in the pre and post administrations of the academic writing skills test favoring the post administration ".

To test the validity of this hypothesis, the (t) test was employed to two paired groups in pre and post-test of the academic writing skills test for the experimental students group. The results are shown in the following table ( ):

Table (8)
The value of "t" test and the level of its significance for the difference between the experimental group in the pre and post test of the academic writing skills test

| Variable	Test	N	Mean	Mean paired differences	Std. Deviation	Std. Deviation paired differences	df	T	Sig
Academic writing skills	Pre- test	110	28.64	50.17	1.179	1.981	109	265.643	.000
	Post- test	110	78.81		1.835				

It is shown from the previous table (8):

- High of mean scores for post-test about mean score of pre-test for experimental group students in total test of the academic writing skills, where experimental group students got an mean (28.64) in pre-test of total test, while got a mean (78.81) in post-test of the academic writing skills test. it's mean the mean scores in post-test of the academic writing

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skills test for experimental group students was higher than the mean scores in pre-test of the academic writing skills test.

- Mean paired differences between the mean scores of the pre-test and post-test of the academic writing skills test was reached (50.17).

- also the calculated value of (t) for the significance of the difference between the mean scores of the pre-test and post-test of the academic writing skills test, which reached (265.643) and the significance level is (0.000) which is lower than the level of significance (0.05); Thus, there is statistically significant difference at the level of significance (0.05) between responses of experimental students in the pre-test and post-test of total the academic writing skills test in favor of the post test

- This result can be illustrated by the following figure (4):

Figure (4)
A graph showing of mean scores for pre and post test
In the academic writing skills test for experimental group
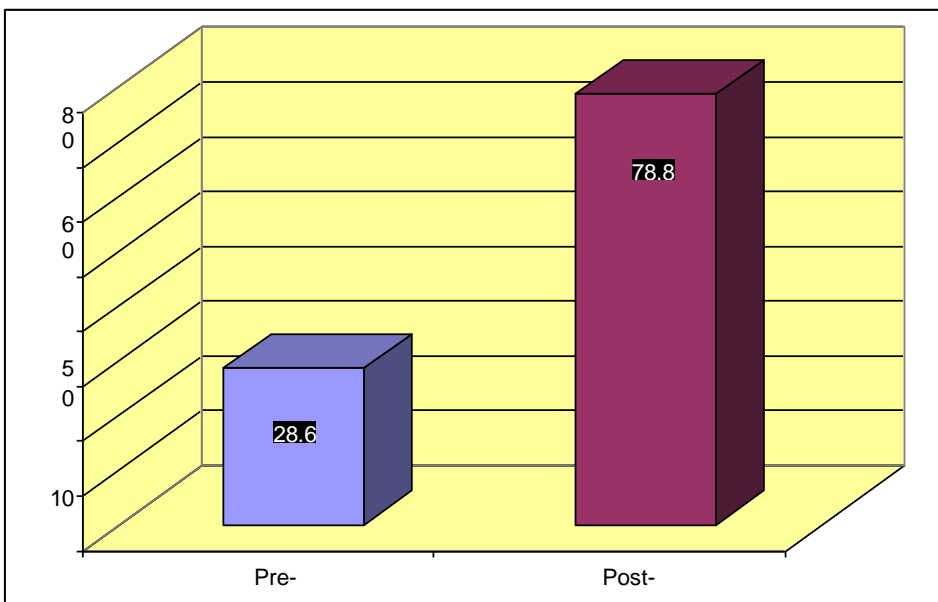
- This means accepting the second hypothesis of research, and this indicates that there is difference at the level of (0.05) between the mean scores of the experimental group in the pre-test and post-test of the academic writing skills test in favor of the posttest.

Third hypothesis of the research

The third hypothesis Stated that " ChatGPT independent learning are effect in enhancing physiotherapy students' academic writing skills ".

To test the validity of this hypothesis, the effect size of the ChatGPT independent learning on enhancing the physiotherapy students' academic writing skills .

The following table (9) illustrates the effect size of the ChatGPT independent learning on developing the academic writing skills.

Table (9)
Value of (η^2) and the level of effect size

The Independent Variable	The Dependent Variable	Implementation	t	η^2	Effective Size	d	The Effective
ChatGPT independent learning	academic writing skills	Experimental Group - Control Group	232.775	0.996	99.6%	31.531	High
		Pre test - Post test	265.643	0.994	99.4%	25.328	High

The previous table (9) shows the following:

- The value of Eta-square (η^2) for experimental group - control group in academic writing skills was (0.996).

This means that (99.6%) of variance in the level of academic writing skills is due to use the

ChatGPT independent learning, The value of (d) equal (31.531) means the effect size of using the ChatGPT independent learning on students' academic writing skills is large, because the value of (d) is higher than (0.8).

• The value of Eta-square (η^2) for Pre test - Post test in academic writing skills was (0.994). This means

that (99.4%) of variance in the level of academic writing skills is due to use the ChatGPT independent learning, The value of (d) equal (25.328) means the effect size of using the ChatGPT independent learning on students' academic writing skills is large, because the value of (d) is higher than (0.8).

• This means accepting the third hypothesis of research, and this indicates that the ChatGPT independent learning are effect in enhancing physiotherapy students' academic writing skills .

In order to verify the effectiveness of teaching by using the ChatGPT independent learning, the modified earning ratio of Blake and its significance was applied for developing academic writing

• skills for Physiotherapy Students'. the results were as shown in the following table ( ):

Table (10)
Blake's modified ratio and its significance for Developing Academic writing skills for Physiotherapy Students'

| Variable	Final Grade	Pre Mean	Post Mean	Ratio of Blake	Significance
Academic writing skills for Physiotherapy Students'	100	28.64	78.81	1.205	Acceptable

It is clear from the previous table (10) that:

- Teaching by Using the ChatGPT independent learning effectiveness in developing academic writing skills for physiotherapy students', as the earning rate reached (1.205), which is considered an

acceptable percentage; This indicates that the use of Teaching by Using the ChatGPT independent learning are effective in developing the academic writing skills for physiotherapy students'(the research sample).

- This result can be illustrated by the following figure (5):

Figure (5)

A graph showing of mean scores for experimental group In the academic writing skills test
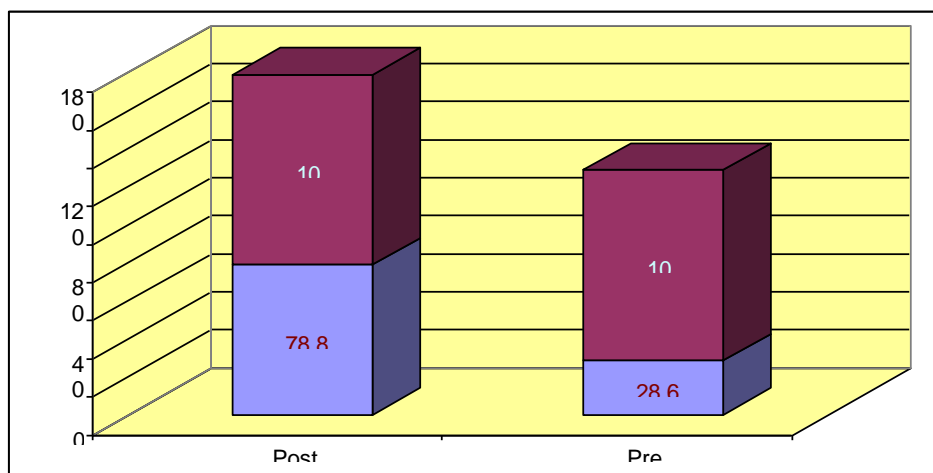
5-Interpretation, Recommendations and Suggestions:

Throughout the discussion of the previous results, it has become clear that ChatGPT Independent Learning in Enhancing Physiotherapy Students' academic writing skills. Through these results, a number of conclusions can be made:

1. The students tend to be more proficient academic writer through using ChatGPT Independent Learning

2. ChatGPT Independent Learning were effective in enhancing physiotherapy students' academic writing skills.

3. Academic learning language with their target skills can be effectively enhanced through using technology and computer assisted language learning.

4. ChatGPT Independent Learning provided the students with positive teaching and learning environment.

5. ChatGPT Independent Learning helped the students in being more active, initiative and creative.

6. ChatGPT Independent Learning connected the students with academic real-life situations of language use and thus, this made learning more realistic to them.

5.1.Recommendation:

In the light of the results and conclusions of the present study, the following recommendation are recommended:

1. Students enrolled in the first year, faculty of physiotherapy should be trained in an effective ESP ChatGPT Independent Learning.

2. ESP instructors in the faculty of the Physiotherapy should receive training in using effective ChatGPT

Independent Learning to improve the students 'academic writing skills.

3. It is recommended that curriculum designers should depend on developing academic writing skills through using technology.

4. During performing the program, students should be provided with a relaxing and effective environment.

5.2. Suggestion for further researches:

-Out of the study results, conclusions and recommendations, the following areas of the study may be suggested for further research:

1. Developing a program through using ChatGPT Independent Learning for developing other skills are not dealt with in the present research and then it is needed to investigate its effect on the other communicative language skills.

2. Designing an effective ChatGPT Independent Learning for developing students' writing skills in the pre-university stage.

3. Developing EAP ChatGPT Independent Learning language programs in different faculties.

4. Determing the long-term effect of using the ChatGPT Learning in effective different strategies.

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