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Abstract

This study explored the impact of Six Thinking Hats blended learning program-based Moodle on ESP university students' writing skills and academic flow. Four instruments -designed by the researcher- that included: (a writing skills checklist, a writing skills test, a writing scoring rubric, and an academic flow scale) were used for collecting data. The research adopted the quasi-experimental design using two groups: an experimental group (n = 33), and a control one (n = 33). The researcher taught both groups: the experimental group was taught using Six Thinking Hats blended learning program-based Moodle. In contrast, the control group was taught through the regular teaching method. Research results revealed statistically significant differences between the mean scores of the experimental and the control group students in the writing skills tests and the academic flow scale in favor of the experimental group. Besides, the effect size of the six thinking hats blended learning program-based Moodle was high.

1. Introduction

Nowadays, integrating technologies in the teaching process has become a must since following the traditional method in lecture halls for long hours the method that matched the style of life yesterday- does not work for today's students or tomorrow. Students' lives revolve around laptops, smartphones, educational platforms, and applications. Therefore, teaching should focus on preparing students for digital advances.

During and after their academic life, students practice several forms of writing. Yet, Egyptian ESP university students rarely have opportunities to practice and develop writing in lecture halls during their academic courses. Unlike speaking which is conveyed and made clear through body language, facial expressions, and spoken words besides rhythm, writing is made clear through words. Good writing should have correct structure, logical order, and coherent sentences. For ESP university students, mastering writing skills is the main ingredient for academic progress and passing exams in all faculty courses.

Accordingly, developing writing skills for ESP university students should be given particular consideration. Writing is one of the essential English language skills for academic success as it is the communicative skill used for evaluating students' academic progress. Writing is a planned process that can be developed through proper writing approaches, strategies, and activities. Teaching writing is very significant for students to achieve academic

progress, express themselves, and communicate (McArthur et al., 2008). Students are required to accomplish academic tasks and exams using writing skills. Learners' lack of academic engagement due to the lack of psychological flow results in difficulties during the learning process (Buil et al., 2017). Flow positively impacts students' learning, contentment, determination, and academic achievement (Park et al., 2020; Özhan & Kocadere, 2020).

Research Problem, Purposes, Questions, and Hypotheses

To provide evidence for the current research problem, a pilot study was conducted to determine the ESP university level in writing skills and academic flow. Forty students participated in the pilot study. Results indicated that students' writing skills (word choice, ideas, organization, convention) score percentage (53%) and students' academic flow scale score percentage (48.5%) need development.

Writing has a central role in language production. Yet, it is the most difficult skill to master because students do not write outside classrooms. Students face several difficulties while learning writing skills including a lack of vocabulary, grammar, and academic writing knowledge, and a lack of motivation. (Abdelraouf, 2016; El-Maghraby, 2021). Besides, the effect of Arabic language- students' first language- when writing in English results in misunderstanding because of translating Arabic sentences to English (Gomaa, 2010). Unfortunately, these problems make it difficult for students to develop their writing skills. As for academic flow, Park et al., (2020) and Özhan & Kocadere (2020) agreed that flow positively impacts students' academic immersion and achievement. Yet, many teachers neglect the impact of flow on students' motivation and writing performance. Adas and Bakir (2013) indicated that engaging students in writing tasks in and outside schoolrooms is the leading solution for students' difficulties concerning improving writing skills and academic flow. On the other hand, Zelinskiy (2020) and Mujiono and Siti (2022) recommended using Moodle for several reasons that include: the practicability of using academic resources, feasibility of doing exams, receiving feedback, motivating students to cooperate, improving students' performance and involving students in writing in and outside classrooms.

The current study aimed at using Six Thinking Hats blended learning program-based Moodle to develop students' writing skills and academic flow. The main research question is (What is the impact of using Six Thinking Hats blended learning program-based Moodle in developing ESP university students' writing skills and academic flow?). To answer this question, the following hypotheses were tested:

1. There is a statistically significant difference at the ≤ 0.05 level between the mean scores of the experimental and control group in the writing skills pre-and post-test scores in favor of the experimental group.
2. There is a statistically significant difference at the ≤ 0.05 level between the mean scores of the experimental group in the writing skills pre-and post-test scores in favor of the post-test.
3. There is a statistically significant difference at the ≤ 0.05 level between the mean scores of the experimental and control group in the academic flow pre- and post-scale scores in favor of the experimental group.
4. There is a statistically significant difference at the ≤ 0.05 level between the mean scores of the experimental group in the academic flow pre- and post-scale scores in favor of the post-scale.

Review of Literature

The Significance of Writing Skills

Writing is supposed to be of countless significance as it is the most common assessment tool for evaluating students' academic progress. Students with weak writing abilities face difficulties and struggle to pass exams (Yavuz-Erkan & İflazoğlu-Saban, 2011). According to Harmer (2007), teaching writing supports language learning as it necessitates a good command of grammar, punctuation, vocabulary, structure, coherence, and cohesion.

Writing is essential for transmitting messages and meaning since the English language is written by non-natives in many contexts such as technology, engineering, medicine, tourism, politics, etc. (Khasawneh, 2010). Bagci (2019) explained that the positive impact of developing writing skills on language learners includes: being involved in transmitting ideas into organized and comprehensible sentences activating the mental processes, writing requires practicing reading and listening, writing improves students' ability to choose the proper words and expressions to affect readers' feelings. Writing skill is defined by Nunan (2003) as a thinking process to create, develop, and arrange ideas in clear sentences and paragraphs. Writing skill is operationally defined as ESP university student's ability to use six thinking hats blended learning program-based Moodle to improve writing skills.

ESP University Students Writing Challenges and Difficulties

Writing skills are not easy for students to master. Writing necessitates a convenient level of linguistic, grammar, and vocabulary knowledge. Abdelraouf (2016) and Koura & Zahran (2018) pointed to the challenges Egyptian students face while learning and improving their writing skills. These difficulties include (1) the misuse of vocabulary, word repetition, and ambiguity of meaning as a result of the lack of vocabulary knowledge, (2) the inadequate practice of grammatical rules that led to incorrect sentence structure, (3) the lack of academic writing knowledge that include the proper use of words, transitions and sentence structure and (4) using improper writing approaches and strategies. Harmer (2007) added that native language influences the process of developing writing skills. Gomaa (2010) summarized the writing difficulties that Egyptian students face as a result of the impact of the first language when writing in English:

(1) translating Arabic into English which causes misconstruction and misinterpretation,
(2) the difficulty in using English punctuation as Arabic language punctuation is completely different
(3) organizing writing using the same idea in conclusion as the topic sentence whereas in Arabic there should be a new idea, and
(4) students' difficulties in reading comprehension results in poor writings.

According to Koura & Zahran (2018), reasons for students' weaknesses in writing include:

(1) concentrating on correcting grammatical mistakes and ignoring students' desire to write about their preferred topics,
(2) students' fear of writing since the focus of their teachers is mainly on the final product rather than the

process itself,

(3) pushing students to write for getting grads in the exam rather than learning how to write and

(4) the lack of consistent feedback from teachers, especially in large size classes.

Yavuz-Erkan & İflazoğlu-Saban (2011) added that students' attitudes and beliefs about writing impact their writing performance. Furthermore, Gupta and Woldemariam (2011) investigated the relationship between students' motivation and the development of writing skills. They found that motivation results in a positive attitude toward writing, confidence, and enjoyment which positively impact writing skills.

Academic Flow

Csikszentmihalyi (2014) pointed to the reason behind completing some tasks with interest and motivation and called it flow. Buil et al., (2017) described flow as a motive that causes a state of devotion, commitment, and attention to a task. The state of flow creates a feeling of mindfulness, clarity, fluency, and intelligibility. Individuals feel that time passes quickly. Moreover, they feel immersed in the assigned task and their goals become directed toward completing the task with an intrinsic motivation that causes a feeling of enjoyment. In a state of flow, feedback is undisputable and no attention is given to evaluation since goals are clear. People experience flow when they have a driving factor that motivates them to achieve a certain task and have feelings of well-being and enjoyment (Bakker et al., 2017).

Flow is the motive that drives students to be fully engaged in the learning process. According to Sumaya & Darling (2018), flow impacts academic achievement. Csikszentmihalyi (2014) defined academic flow as a comprehensive feeling of immersion when working on a task and described that the state of flow leads students to forget time, exhaustion, and everything else but the task itself. Bakker et al., (2017) defined academic flow as a feeling of enjoyment, involvement, and inner motive that drives learners to accomplish a certain task. Academic flow can be operationally defined as being fully motivated and immersed in achieving the assigned writing task.

Features and Dimensions of Academic Flow

According to Bakker et al., (2017), the components of academic flow are immersion, enjoyment, and motivation. The academic flow leads learners to be fully motivated and engaged in the assigned task neglecting anything else. The state of flow also makes people feel enjoyment and comfort resulting from achieving their targets. Csikszentmihalyi (2014) and Buil et al., (2017) divided the features of academic flow into nine traits:

(1) setting clear goals that lead to satisfactory results,

(2) receiving feedback for improving performance,

(3) making a balance between actual skills and possible obstacles. This balance enables students to find methods for overcoming challenges which in turn give them a feeling of achieving victory,

(4) making a balance between concentration and accomplishments,

(5) intensive concentration on one task,

(6) controlling any surrounding circumstances,

(7) losing attention to anything else rather than the assigned task,
(8) being unconscious towards time as a result of being fully engaged in accomplishing a certain task,
(9) being interested in reaching a clear goal without expecting or being motivated by a reward.

According to Dörnyei and Ushioda (2011), four dimensions of flow include

(1) a balance between challenge and personal skills while the existence of high challenge with low skills causes anxiety and the existence of high skills with low challenge causes boredom,
(2) attention and intensive concentration when accomplishing tasks to the point of reaching fluency and accuracy as well,
(3) interest that is divided into emotional involvement, curiosity and personal preference for a task and
(4) having control and self-sufficiency.

The Flow Theory in English Language Teaching and Learning

Aubrey (2017) examined the relationship between the state of flow and academic achievement. The author confirmed that the academic flow positively impacts language improvement. Applying the theory of flow in language teaching can positively impact students' motivation and interest. To reach the state of flow, the teaching material and methods should involve students in the learning process. Therefore, designing activities and tasks that are characterized by having clear goals, including technology use, and giving students immediate feedback is very significant. The academic flow impacts students' skills and develops their performance. Reaching the flow state depends on the learners' skills, the assigned task, and the learning environment. Guan (2013) specified the principles that enable teachers to generate the state of academic flow inside language classrooms:

(1) designing interesting, challenging, and achievable tasks with clear goals,
(2) providing students with meaningful tasks that they can achieve without teachers' interference and
(3) designing tasks in a way that enable students to have control over the task.

The Six Thinking Hats Model

De Bono (1999) developed a model that covers several modes of thinking that enable students to consider several viewpoints while writing on a topic. De Bono (1995) stated that the brain is an active thinking system. De Bono established the six thinking hats model based on various thinking styles. According to this model, six modes of thinking are distinguished and identified with a colored hat: white hat represents facts and objective thinking, red hat represents feeling and emotional thinking, black hat represents negative thinking, yellow hat represents logical productive ideas and positive thinking, green hat represents originality in producing new ideas and creative thinking, and blue hat represents critical thinking.

The six hats cover the main moods of thinking. Six Thinking Hats is a thinking model that provides students with a means for planning creative thinking (Aithal & Kumar, 2017a). It is an effective model for developing students writing skills, thinking abilities, and problem-solving (Ren, 2007). The Six Thinking Hats model can be operationally defined as a thinking model that impacts students' creativity, critical thinking, and writing skills.

Moodle E-learning Platform at ESP Higher Education

A modular object-oriented dynamic learning environment (Moodle) is a learning management system with several facilities for the educational process such as blogs, chat, e-content, online quizzes, etc. Moodle is an open e-learning platform designed to promote the teaching and learning process (Moodle, 2018). Moodle is an educational platform with several learning services including hosting files, quizzes, assignments, chat, discussion forums, etc. (Alomari, 2024; Schettini et al., 2020; Yuksel, 2022). It is an interactive and effective E-learning tool to participate, access material, receive feedback, and do quizzes. Moodle provides opportunities for communication between students and lecturers outside schoolrooms and cooperation between groups inside the same class. Furthermore, it motivates students to be responsible for their learning (Gulbinskienė et al., 2017). Moodle can be used for teaching writing whether face-to-face, blended, or online since it is easy to access, has free courses, and is available in different languages (Moodle, 2018). Moreover, the organization and classification of learning help students choose resources according to their needs. Besides, the evaluation tools enable students to follow their academic progress and improve their skills (Rymanova et al., 2015).

In Moodle, the tasks and quizzes are supervised and controlled by lecturers. Additionally, through Moodle log reports lecturers can know the exact time students take for completing an assignment or a quiz and what time their students upload an assigned task. Besides, lecturers can classify, edit, hide, and change their uploaded course materials at any time. Moodle also provides a convenient variety of assessment tools that lecturers can use in designing quizzes to measure students' learning outcomes and stimulate peer evaluation. All these features make Moodle an effective teaching tool (Wang & Vásquez 2012 and Lambda Solutions 2017). The central idea of Moodle is based on the social constructivism philosophy that attempts to offer an educational medium for online communication and cooperation (Tang, 2013). Moodle can be operationally defined as a teaching tool based on online interaction and collaboration to develop ESP university students' writing skills and academic flow.

Six Thinking Hats blended program-based Moodle for Improving Writing Skills and Academic Flow

Students' thinking abilities are needed for comprehending information, analyzing situations, solving problems, and developing knowledge. Writing is a tool for sharing ideas and conveying knowledge. It is the reflection of the thinking process. Several studies (e.g., Swamy et al., 2019; Al-Khataybeh & Al-Tarawneh, 2015; Kivunja, 2015; Al-Bakri, 2011) investigated the impact of the six thinking hats model on students and found that it has a positive effect on developing writing skills, creativity, critical thinking, and problem-solving. The Six Thinking Hats model enables students to practice writing based on different thinking moods. Students practice expressing feelings, creative writing, writing logical thoughts, criticizing, and writing positive and new ideas. Practicing different moods of writing works for students' different needs and learning styles.

Developing writing skills requires being involved in writing in and outside classrooms. It is a process that consists of prewriting, first draft, editing, and proofreading that can be taught and improved. Adas and Baki (2013) investigated the impact of using Moodle on university students writing skills. The authors found that Moodle positively impacted students' writing skills. Moodle has proved to be helpful for learners in the writing phases –

prewriting, revising, editing, and publishing. Additionally, Moodle is an effective tool for self-learning and evaluations of punctuation, grammar, and vocabulary. Ueda et al. (2018) as well as Zelinskiy (2020) agreed that Moodle could be effectively used for improving writing skills in and outside classrooms due to the viability of using teaching resources, doing online exams, giving feedback, and using collaborative tools in Moodle that motivate learners to cooperate in writing and publish their writings. Mujiono and Siti (2022) examined the impact of using Moodle on university students writing skills. They found that Moodle positively impacted students writing skills. It was confirmed that the experimental group in the virtual classroom outperformed the control group. Therefore, the authors recommended using Moodle as a teaching tool to enhance university students' writing skills.

As for the academic flow, Buil et al., (2017) and Bakker et al., (2017) agreed that academic flow is an inner drive that pushes students to complete a task. According to Aubrey (2017), there is a positive relationship between flow and academic performance. Guan (2013) stated that designing interesting and challenging tasks with comprehensible aims creates a state of flow inside schoolrooms. Rymanova et al., (2015) indicated that being accessible, unrestricted, easy to use, a tool for students to reach different learning resources and develop their performance in light of the feedback they receive, Moodle is considered an advantageous platform for blended learning that motivates students to study independently and collaboratively with each other. It enables students to oversee their academic level and increase their language skills and academic performance.

Moreover, Swamy et al., (2019) and Kivunja (2015) confirmed that the six thinking hats model is an instructional thinking model that impacts students' creativity, critical thinking, and problem-solving. The model activates different thinking moods that are reflected in students' writings. Since thinking is an ongoing process, the six thinking hats model can be the driving factor that enables students to experience an academic flow state while enhancing their writing skills. All these features and advantages of Moodle and Six Thinking Hats lead the researcher of the current research to suggest that using Six Thinking Hats blended learning program-based Moodle might have a positive impact on developing ESP university students' writing skills and academic flow as well.

Method

Design

Adopting the quasi-experimental design, the pre-writing skills test and academic flow scale were administered to both groups before the treatment. The experimental group was trained using six thinking hats blended program-based Moodle E-learning platform. In contrast, the control group was taught the regular method. Then the post-writing skills test and academic flow scale were administered to both groups. The results of the pre-posttest and scale were analyzed using a t-test.

Participants

The participants were a sample of ESP Egyptian pharmacy students at Horus University. Students were randomly divided into an experimental group (n =33) and a control group (n=33). Learners' age was between nineteen and

twenty years.

Instruments

For achieving the study purposes, the researcher prepared four instruments that included (a writing skills checklist, a writing skills test, a writing skill scoring rubric, and an academic flow scale). The validity of the instruments was established through jury validation. Cronbach's Alpha was used to measure the internal consistency for the writing test and academic flow scale. The alpha coefficient value for the writing test was 0.695, and the alpha coefficient value for the academic flow scale was 0.680. These values indicate a high value of test and scale reliability.

The Training Program Description, Duration and Content

Based on six thinking hats, the Moodle E-learning platform, the writing skills checklist, and related literature, the program was designed to develop ESP university students writing skills and academic flow. The program was applied through ten sessions. The training program started with an introductory session to explain the general guidelines of the treatment, such as aim, needs, objectives, content, time, tasks, teaching/learning techniques, benefits, and evaluation methods that would be used. The program continued for one semester- 12 weeks (March, April, and May) during the academic year 2022/2023. The four taught types of paragraph writing included descriptive, narrative, expository, and persuasive paragraphs.

The researcher met the experimental group students once a week (5 sessions were virtual through Moodle and 5 face-to-face sessions). The teaching materials were uploaded to Moodle. Students were allowed to download, and upload their tasks at any time. Quizzes were done through Moodle. In contrast, the control group students received face-to-face traditional training at lecture halls for the same types of paragraph writing. Unlike the experimental, the control group did not train using six thinking hats blended program-based Moodle.

Two types of evaluation were applied: formative and summative. The formative evaluation was conducted to assess students' progress in writing skills and academic flow. Formative evaluation took place on three levels; self-evaluation, group evaluation, and the author evaluation according to the writing rubrics. The summative was conducted by measuring the effect size of the six thinking hats blended program-based Moodle on developing ESP university students' writing skills and academic flow by comparing the results of the pre-post writing test and the pre-post academic flow scale.

Results and Discussion

The results are reported in terms of the study hypotheses. The t-test was used to verify the first hypothesis that states a statistically significant difference at the ≤ 0.05 level between the mean score of the experimental group and the control group on the post-administration writing skills test favoring the experimental one. Table 1 shows the differences between the mean scores of students in the experimental and control groups regarding the writing

skills test.

Results in Table 1 indicate that the mean score of the experimental group post-test is higher than that of the control group's mean score.

Table 1. Comparing the Writing Skills of the Control and Experimental Groups on the Post-test

Writing Achievement	Groups	Test	Mean	SD	t value	Sig.
Word Choice	Experimental	Post-test	14.03	1.29	15.2	0.05
	Control	Post-test	9.71	1.67		
Ideas	Experimental	Post-test	15.51	1.32	13.7	
	Control	Post-test	10.43	1.72		
Organization	Experimental	Post-test	16.31	1.78	12.5	
	Control	Post-test	12.19	1.67		
Conventions	Experimental	Post-test	13.95	1.36	14.8	
	Control	Post-test	10.12	1.77		
Total	Experimental	Post-test	59.23	18.34	18.7	
	Control	Post-test	38.13	9.89		

As measured by the pre-post-test scores, there was development in the experimental group due to teaching using the Six Thinking Hats blended learning program-based Moodle. The researcher noticed that the experimental group students had a positive attitude towards using the six thinking hats model. This model enabled students to enhance imagination, creativity, and thoughtful thinking. It improved their ability to use different thinking moods while writing. This result is in line with Swamy et al., (2019) and Al-Khataybeh & Al-Tarawneh, (2015) who confirmed that the six thinking hats model is an effective instructional model for developing writing skills. Using the Six Thinking Hats blended learning program-based Moodle platform enabled students to use the six thinking moods, teaching resources, and online exams, and the feedback they received through the Moodle platform helped students develop their writing skills.

Students could make use of feedback in revising and editing processes. Publishing their writing on Moodle also motivated students to improve their performance. Moreover, both features: (1) the availability of using Moodle in and outside school time, and (2) setting the deadline for tasks and quizzes according to students' choices gave students a feeling of taking control over their learning. Students' sense of controlling their learning created a state of flow which led them towards improving their writing performance. This result is in line with Ueda et al. (2018) and Zelinskiy (2020) who confirmed that Moodle is effective in developing students writing skills.

For the second hypothesis that states a statistically significant difference at the ≤ 0.05 level between the mean score of the experimental group on the pre-and post-administration of writing skills test favoring the post-administration scores, t test was used to compare the differences between the pre-and post-test scores as presented in Table 2.

Table 2. Comparing the Writing Skills of the Experimental Group on the Pre and Post-test

Writing Achievement	Groups	Test	Mean	SD	t value	Sig.
Word Choice	Experimental	Post-test	14.03	1.29	19.8	0.05
		Pre-test	9.45	2.45		
Ideas	Experimental	Post-test	15.51	1.32	22.3	
		Pre-test	8.97	2.63		
Organization	Experimental	Post-test	16.31	1.78	18.5	
		Pre-test	11.82	2.10		
Conventions	Experimental	Post-test	13.95	1.36	18.9	
		Pre-test	8.91	2.71		
Total	Experimental	Post-test	59.23	18.34	30.7	
		Pre-test	48.89	10.13		

Results in Table 2 indicate that the mean score of the experimental group post-test is higher than the pre-test. The increase in students' level is due to using the six thinking hats blended learning program-based Moodle that provided students with opportunities to learn, cooperate, and publish their writings. Unlike the control group, the experimental group students were responsible for learning. Moreover, they were free to log in at any time, do exams, download material, and upload their writings on Moodle. Being responsible for their learning students could develop their writing skills and enhance imagination and creative thinking by using the six thinking hats model.

Table 3 shows the effect size of six thinking hats blended learning program-based Moodle on experimental group students' writing skills.

Table 3. Effect Size of the Training Program on Improving Writing Skills of the Experimental Group Students

Writing Skills	t value	η2	Effect size
Voice/Word Choice	19.8	0.87	High
Ideas	22.3	0.90	
Organization	18.5	0.85	
Conventions	18.9	0.85	
Total	30.7	0.95	

All values exceeded 0.50 indicating a high effect size for all writing skills. This result is in line with Mujiono and Siti (2022) who found a positive relationship between using Moodle and improving university students' writing skills. It is also in line with Swamy et al., (2019) who confirmed the positive impact of using the six thinking hats model on students' writing skills.

To test the validity of the third hypothesis that states there is a statistically significant difference at the ≤ 0.05 level between the mean score of the experimental group and the control group on the post-administration academic flow scale favoring the experimental one, a t-test was used. Table 4 shows the results.

Table 4. Comparing the Academic Flow of the Control and Experimental Group on the Post Scale

	Groups	Scale	Mean	SD	t value	Sig.
Academic Flow Scale	Experimental	Post-scale	133. 6	9.45	19.2	0.05
	control	Post-scale	83.2	10.5		

Table 4 shows that the mean score of the experimental group in the post-scale is higher than that of the control group. Using the six thinking hats blended learning program-based Moodle motivated students to be involved in the writing tasks. Using the teaching material, feedback, online quizzes, and the feasibility of logging into Moodle at any time encouraged students to be engaged in the learning.

The features of both Six Thinking Hats and Moodle created a state of flow among students motivating them to be immersed in accomplishing the target of developing their writing. This result is in line with Aubrey (2017) who assured that flow state positively impacts academic performance. As for the control group, the students did not receive training on six thinking hats-based Moodle as the experimental group. As a result, control group students could not be immersed in the learning process or experience the academic flow. Therefore, the control group students' scores on the academic flow scale were lower than the experimental group.

To test the validity of the fourth hypothesis that states there is a statistically significant difference at the ≤ 0.05 level between the mean score of the experimental group on the pre-and post-administration academic flow scale favoring the post-administration scores, the t-test was used as shown in Table 5.

Table 5. A Comparison of the Experimental Group on the Pre and Post-academic Flow Scale

	Groups	Scale	Mean	SD	t value	Sig.
Academic Flow Scale	Experimental	Pre-scale	81.7	14.8	22. 5	0.05
		Post-scale	133. 6	9.45		

As revealed in Table 5 the higher mean score of the academic flow scale is for the post-scale. The experimental group received training on six thinking hats-based Moodle that enabled students to control their learning, cooperate, and be engaged in writing tasks. Besides, designing challenging and meaningful writing tasks without the lecturer's interference has created a state of flow that motivated students to complete the assigned tasks.

Moreover, students did not give much care to evaluation. Their target was developing their writing and accomplishing their tasks. This result is in line with Guan (2013) who stated that designing challenging and stimulating activities creates a state of academic flow that positively impacts students' academic performance.

Table 6. The Effect Size of Six Thinking Hats Blended Program-based Moodle on the Academic Flow of the Experimental Group Students

Academic Flow Scale	t value	η2	Effect size
Total	22.5	0.86	High

Table 6 shows the effect size of the program on experimental group students' academic flow indicating a high effect size for all scale items.

Conclusion

The relationship between using six thinking hats blended program-based Moodle and developing ESP university students' writing skills and academic flow was investigated in the current research. It was found that the suggested program provided students with several opportunities such as choosing the appropriate time for uploading their writing, doing online exams, receiving feedback, and using online teaching materials. Furthermore, by sharing the different moods of thinking through their writing, students were motivated to develop writing skills and be immersed in completing the required writing tasks. All these educational features and services for both Six Thinking Hats and Moodle platform enabled students to set their learning goals, motivated them, and engaged them in the learning process. Therefore, a state of flow was created that consequently equipped ESP university students with the required skills for developing writing skills.

It was noticed that the Six Thinking Hats program-based Moodle helped students to be immersed in the writing activities without fear of evaluation. Their target was accomplishing the tasks and developing their performance. Moreover, uploading their writings on Moodle encouraged them to write coherent, cohesive, meaningful, and ordered ideas.

To sum up, Six Thinking Hats blended program-based Moodle was effective in developing writing skills and academic flow. Therefore, regarding the current research findings, ESP university academic programs should be designed based on Moodle since it is an effective teaching tool that supports online assessment of students' performance. Furthermore, future research is needed to examine the efficacy of six thinking hats on developing critical reading skills, critical thinking, and problem solving.

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