Using Artificial Intelligence to improve Writing Fluency for The Preparatory Stage Students in Distinguished Governmental Language Schools

A Dissertation
Submitted in Partial Fulfillment of the Requirements for
the Ph.D. Degree in Education
(Curriculum and Instruction - EFL)
By

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Abstract

This study aimed to investigate the effect of using some proposed AI activities on enhancing EFL writing fluency for the preparatory stage students in Distinguished Governmental Language Schools. Participants of the study were 33students in preparatory three from Hassan Abu Bakr governmental language school in the academic year 2021– 2022. The researcher`s instruments included writing fluency components checklist, a rating scoring rubric and a pre/post writing fluency test. Participants were taught through using some relevant AI applications designed by the researcher that included Minecraft game with grammarly mood, Semantris vocabulary AI game and virtual reality in AI mood that enabled the students to practise using English in vivid situations. Participants' scores on the pre and posttest were statistically analyzed using T- test and effect size. The researcher also used a qualitative analysis of the students' writing fluency level. Results of the study revealed the positive effect of using AI applications on enhancing third preparatory stage students` writing fluency.

Keywords: Artificial intelligence, writing fluency.

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Introduction

Learning English is an indispensable process all over the world. People tend to dedicate time, effort, and money to adopt different programs for learning it to be able to communicate, find job opportunities, explore the world and identify different cultures through watching English movies, songs, and programs, in addition to many scholarships that require a high level of mastering the English language.

Despite people`s and countries` awareness of the importance of learning English, learners encounter many challenges throughout the learning process. According to William et al. (2019), these challenges may be due to many reasons, such as the use of old methods in teaching that are not equivalent to current needs, or motivate learners to learn, tend to focus on mere learning grammar and vocabulary away from any natural authentic context. The lack

of chances for learners to practise English, which is restricted to the classroom, does not allow them to use the language sufficiently. Such challenges affect their language fluency. Instead, recent methods regard language as a medium for learners to construct meanings that contribute to students` active participation and interaction with their teachers and mates.

Teaching a foreign language includes many considerable aspects. These aspects could be the learners' reading and writing abilities, or their ability to comprehend grammatical structures. However, there are certain aspects of a language that give a sense of smoothness or could be regarded as effortless. This part can be perceived as fluency.

English language fluency is one of the most important aims of language learning. Most people all over the world depend on using English to communicate with each other, share ideas, find job opportunities, share thoughts and beliefs. According to Jones (2020), fluency can, furthermore, be described as being able to string words together, like pearls on a chain, into sentences and make them comprehensible. In other words, it is a meaningful flow of words. Tavakoli et al., (2020) explained that there has been an increasing amount of research over the past decades on language fluency due to its significant role in developing communication abilities and its significant contributions to the assessment of learners` proficiency.

Van Waes & Leijten(2015), indicate that despite the importance of English fluency in general, there is a lack in writing fluency research. Rouhani, et al., (2016) also explain that writing is a common process of communicating and explaining information in written forms. Being a fluent writer could be an essential factor for success throughout one's life. Writing fluency is necessary for English learners to be successful both in the classroom and in the

workforce. Moreover, being fluent in writing is an essential key factor for progress in learning language, whether in the classroom or in different aspects of life.

Writing fluency definitions differ according to the perspective of researchers. According to Atasoy and Temizkan (2016), fluency is the most distinguishing feature of a well-organized, functional, and comprehended text, so writing fluency can be defined as the ability to write the topic in a well-organized manner that does not affect the reader's perception of the writer's intended meaning. Writing is a way of expressing opinions, ideas, and thoughts. Nevertheless, several researchers such as Gayed et al., (2022) confirm that English learners all over the world face various challenges in achieving this high level of mastering writing activities such as organization and reflection and that the learning process only concentrates on lower-writing activities such as memorizing words and translation.

The world is changing every day and new technologies are replacing methods of reading and writing, so there is a need to search for new methods that motivate students to learn and cope with the new communication and information technologies. Writing fluency represents an essential communicative requirement for any academic discipline. It is crucial for language learners as it allows them to express their opinions and reflect on their own experiences in writing. Nevertheless, many researchers such as Rahimi and Zhang (2018), noticed that many learners suffer from their inability to communicate their thoughts due to their poor writing fluency. This insufficiency of writing fluency affects learners` academic success badly.

1 Artificial Intelligence (AI)

Chassignol et al., (2018) clarified that Digital technologies are clearly considered an essential part of our daily lives. They are effective tools in searching for information, facilitating communication among people, and even between people`s

relationships with one another. Consequently, the educational field has also begun to witness colossal changes. These changes have made the educational process more productive and engaging. Recently, various interactive instructional tools have gained popularity in the educational system. Teachers are becoming more conscious of using alternative learning platforms in learning, such as Google Classroom, Edmodo, Power School, and Moodle. There are also a large number of Massive Open Online Courses (MOOCs) for online studies, such as coursera.com In addition to numerous educational institutions that use Learning Mangement Systems (LMS) such as Moodle. Artificial intelligence (AI) applications are also used as powerful tools to facilitate learning and develop the educational process.

According to Morony et al., 2013; Platsidou & Kantaridou, 2014 , the main purpose of educational strategies in all fields of learning, especially teaching English as a foreign language, is to enhance the learning processes of learners and make learning easier and more productive. As a result, certain motivational outcomes, such as academic self-efficacy and task value, could serve as significant learning outcomes. That is why educational systems are constantly searching for ways to provide learners with the desired motivational outcomes that contribute to involving them in formal and informal educational and learning activities.

Moreover, Borna & Fouladchang (2018), G.H.R (2015), and Rosas & Esquivel (2016) discussed the role of educational approaches as one of the most important elements affecting motivational outcomes. Finally, Prince (2017)) reported that one of the most important outcomes of effective education is to achieve positive motivational production such as academic self-efficacy and task value in learners. One of the most prominent technology applications that help to achieve this target is artificial intelligence.

Recently, many researchers have emphasized the significance of using artificial intelligence systems in learning (e.g., Luckin et al., 2016; Woolf et al., 2014). According to Salas-Pilco et al., (2022), AI has become an integral component of the learning and training

process. This type of technology can make learning English easier and more enjoyable. Nevertheless, it can be regarded as a natural development for computerized media as Karkera (2018), Yoestara, and Putri (2019) explain that learners made several attempts at using various computerized media to improve their language abilities before the widespread usage of AI, such as radio applications, YouTube, and podcasts. AI increased the value of these media, for example, self-correction and contact with human-like native speakers, (humanoids). AI is currently classified as edutainment or educational entertainment.

Intelligent Tutoring Systems (ITS) employ AI applications to simulate one-on-one human tutoring by supplying learning experiences that are best suited to a learner's cognitive needs and affording focused and appropriate feedback, all without the need for a single teacher. ITS enable learners to provide the system with information about their problem step by step in the same way of dealing with paper. Then the system presents feedback based on all the students' answers. Therefore, ITS have ability to interact with learners at the step-level, rather than mere giving feedback after completing the task.

Suh & Prophet (2018) indicate that virtual reality has recently gained a remarkable interest in educational research .It is an effective medium for learning that simulates some features of the real world. This simulating medium allows users to engage in different environments such as dangerous ones or somewhere geographically or historically inaccessible. However, for virtual reality, learners would not have the ability to access such environments or have the feeling of being participants in realistic activities.

Several studies have shown that immersion in intelligent virtual reality can significantly improve educational outcomes for learners. For instance, the study of Khare et al. (2018) asserted the positive effect of artificial intelligence applications on students`

achievement. The study of Tuomi (2018) also emphasized the significance of artificial intelligence in providing rich educational environments and the possibilities of solving common problems of education using artificial intelligence applications.

Moreover, Fryer (2019) asserted the significant role of robots in increasing students` desire to learn other languages. In another related study, Ma and Siau (2018) indicated the positive role of artificial intelligence in developing higher education and replacing the traditional methods of education. In machine learning environments, AI is also being used to assess student attention, feelings, and interaction dynamics, for instance in subject development and monitoring, in an endeavor to create ideal groups for collaborative learning activities and understand trends that predict student drop-out(Rosé et al., 2018). Moreover, these studies showed that this immersion helps learners to experience different situations and environments and enables them to construct their own points of view and their own understanding of these worlds and environments.

AI educational applications such as Chatbots and Duolingo are marvellous AI applications in learning that allow learners to communicate with an application online via text or speech, as they bring dialogue to teaching and provide learners with a naturalistic learning style. They are expected to provide the productive, customized discourse and involvement that language learning requires. In a related study, Kim (2020) asserted that students' writing performance can improve via interactions with Cleverbot. Thus, text with this chatbot can be beneficial for English writing. In a related study by Kim (2020) to investigate the effects of artificial intelligence chatbots on improving Korean college students' English grammar skills. The study included 70 participants for 16 weeks. The results showed that the grammar skills of the participants were remarkably improved after using AI chatbots.

Kukulska-Hulme (2019) asserted that AI Mobile apps, a modern technology, characterized by their high influence on students' learning, and appropriately integrate technology to boost learners' motivation and autonomy. Alamer & Al Khateeb (2021) added that Mobile devices encourage students to have autonomy and freedom in order to expand the amount of time, place, and speed at which they can learn. This broadening of time, place, and pace enables learners to have continual exposure and practise literacy skills and allows learners to receive continuous rather than delayed correction and feedback on their learning topics. Osman (2020) also emphasized that Mobile apps and technology can motivate learners to develop self-control and responsibility. When learners use apps in learning, they are more likely to have the opportunity to do their study activities independently.

Grammarly is an AI-powered app. Taguma et al., (2018) state that is a powerful digital writing tool with more than 20 million international users. Grammarly is also available for tablets, and smartphones with different operating systems. Furthermore, Grammarly can automatically support computers, internet browsers, and social media sites. It is offered in two versions; free version and a premium one. The researcher in the current study used the free one. Minecraft game as an educational tool integrated with Grammarly (AI) application are both being developed as learning tools. Minecraft allows learners to explore a blocky, realistic world and interact with its incidents. The game has two main modes: survival and creative. In the survival mode, players try to survive by having natural resources such as trees, animals, mining, and farming, investing these resources to achieve useful missions. Players can also use blocks to create people or places from their imagination. In the creative mode, players can play freely without any attacks.

According to Roscoe et al. (2014): "One of the exciting aspects of Minecraft as an educational tool, is that it brings with a culture of collaborative learning and knowledge sharing. Mojang, the creators

of Minecraft, have never published instructions for their complex multiplayer game. Instead. Children over the world are using chat, YouTube tutorials, and wikis to teach themselves, and each other… Minecraft encourages creativity, Printcraft's 3D printing option provides a means for teaching fundamental computational, science, technology and engineering concepts".
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The previously mentioned AI applications can be effective in reducing the learners` intimidating feeling of trial and making mistakes which are considered a crucial aspect of learning. Nevertheless, the idea of failing, or the inability to answer questions, is a major hindrance to the learning process. Some learners cannot bear the idea of being put on the spot in front of their mates or authority figures like teachers. An intelligent computer system, developed to help learners in their learning process, is a significantly less intimidating way to deal with trial and error. Additionally, thanks to artificial intelligence applications, students could experiment and learn in a relatively judgment-free context, in particular when AI instructors are able to provide solutions for improvement, such as Grammarly application. In fact, AI is the ideal format for promoting such kind of learning, as AI systems themselves usually learn by a trial-and-error way.

Context of the Problem

Preparatory students often suffer from the problem of not having enough ideas or information to produce organized and cohesive writing. They need to enhance their cognitive and linguistic abilities that negatively affects their writing production.

Throughout the researcher`s experience as an English language teacher, it was noticed that there is a common complaint among preparatory stage Egyptian learners,i.e. inability to find the needed words for their writing or to organize their thoughts cohesively which leads them to give up writing or try to postpone it as much as possible. This could be due to the mechanical way of teaching which causes this fatigue and failure, so there is an urgent need to

aid learners to find ideas, and to increase their ability to express their thoughts in a correct written form, organize these thoughts, and reflect them in their writings.

Boraie et al. (2019) believe that there is a common call all over the world to use alternative methods of teaching and learning English that can achieve effectiveness in providing the learners with real world's requirements such as problem-solving, cooperation, and collaboration.

Numerous studies have investigated the importance of developing learners` language fluency, such as Fellowes and Oakley (2014) who emphasize the necessity of modeling, training, and application and practice to produce spontaneous writing development, arguing that learners need to observe, perceive, interact, and engage with the processes used by an active writer. Therefore the main target of the researcher in this study is not restricted to the learners` writing ability but is expanded to include their writing fluency as well.

The Pilot Study

The researcher designed an unstructured test in writing fluency for a group of preparatory school learners (n = 16), to assess their writing fluency. The researcher measured the learners` logical organization of different ideas, their writing fluency in expressing different thoughts, their feelings, and their ability to build well-structured sentences. The learners were asked to write an introduction about themselves and to answer one of the questions. The results showed a general lack of the learners` writing fluency as follows:

1- 20% were excellent and very good, while 80%of them were between average and weak, as most of them could not write fluently.
2- 80% of the learners could not construct meaning. They could not organize their ideas logically and could not stick to the main topic they were writing about.

3- 92% of the learners made grammatical mistakes that affected the reader`s comprehension of the intended meaning.

4- 88% of the learners had difficulty in expressing their ideas smoothly and kept repeating the same words and ideas.

The researcher should consider the following general aims for teaching English as a Foreign Language in the Preparatory Governmental Language Schools:

- Enhancing the learners` ability to reflect their thoughts and ideas in different ways; orally and in writing.
- Enhancing interaction with each other in various of ways.
- Participation in meaningful discussions.
- Increasing the ability to realize what occurs around them using the English language.

- Increasing pupils' engagement in what goes on among them to be able to communicate in various ways whether face-to-face or in online writing and to be concerned with learning literature.

Several studies investigated the educational implications of artificial intelligence, such as Corvalán (2017), Habeeb (2017), Miailhe (2018), and Ocaña-Fernandez (2019). As a result, it is hoped that the current study will fill a gap in the literature and have possible implications for future educational applications of artificial intelligence to enhance learners` English fluency.

1.4. Statement of the Problem:

Throughout the researcher`s pilot study and observation, it was clear that preparatory three pupils has apparent weakness in their ability to express themselves in various ways, specifically in writing fluency. They also lack the ability to organize their ideas, reflect and construct meaning. This results in having difficulty in using the language as one entity. To overcome this problem and the associated weaknesses, the researcher aims to design a program based on artificial intelligence to increase students` writing fluency.

Study Questions:

The current study tried to answer the following main question:

How can a program based on AI applications in education be designed to enhance EFL students` language writing fluency?

To answer this main question, the researcher tried to answer the following sub-questions:

1- What is the status quo of the third year preparatory stage students' governmental language schools pupils' writing fluency?

2- What is the suggested program based on using AI applications to enhance the students` writing fluency?

3- What is the effectiveness of using AI applications in enhancing the students` writing fluency?

Hypotheses of the study

The researcher in this study tried to verify the following hypothesis:

1-"There is a statistically significant difference at the level of $(0.05 \geq \alpha)$

between the mean scores of the experimental group on the pre and post- writing fluency test administrations for the total degree in favor of the post-test."

2- "There is a statistically significant difference at the level of $(0.05 \geq \alpha)$ between the mean scores of the experimental group on the pre and post -writing fluency test administrations for the sub linguistic components` degree in favor of the post-test."

Significance of the study

The study is significant;

For Learners: emphasizing the importance of artificial intelligence applications in learning that achieved the development of English writing fluency.

For instructors: using the suggested educational artificial intelligence applications on the English learning model to enable them to improve the learners' writing fluency.

For Curricula Developers: putting the results of the research into consideration when they design activities for students.

For Researchers: Drawing researchers' attention to look for, develop and adopt up-to-date strategies that focus on the learner, and the learning environment and assist the learning process.

The Field of EFL:

The study tried to confirm the importance of applying AI in the field of education as it can help to decode students` difficulties and be flexible enough to assist them, to improve the imagination of a collectivity, get an even higher quality of education, and design a new educational experience.

Method:

In this section the researcher indicates the methodology used in the study, the tools, and the experimental procedures. Then it describes the overall study design. It also describes the participants, the duration of the study, the description of the study program, and data statistical treatment.

Study Design

The researcher used the quasi-experimental approach with one-group pre-posttest design along with a mixed research approach combined both quantitative and qualitative assessments.

Participants

The participants of the study included 33 students (boys and girls) (N= 33), aged 15 in preparatory three at Hassan Abubakr governmental language school in Alqaliobia governorate who have been learning English for 11 years .

Instruments of the Study

The instruments of the current study included:

1- The writing fluency components list.

2- A pre-post writing fluency test.

3- The writing fluency rubric.

4- The suggested AI program.

The artificial intelligence program

Purpose of the program. The proposed program was designed to contribute to developing the writing fluency components for preparatory three English learners; through adopting AI applications.

Performance objectives of the program regarding writing fluency. By the end of the program, the learners were expected to:

- Express their thoughts in language in general and in writing fluency in particular, enhance their reflection ability and demonstrate a conscious and thoughtful understanding of the visualized items.
- Demonstrate unity within written sentences, organization, and a clear sequence of events.
- Create a writing sequence, avoid unnecessary ideas repetitions and utilize supplementary ideas.
- Use various coherent sentences in writing naturally and smoothly in addition to having the ability to pinpoint significant ideas with natural rhythm and flow.
- Produce well-written explanations of pictures or videos, showing deep interpretations and producing reasoning links between the ideas and the topic.
- Make correct punctuation, accurate spelling, and maintain using correct grammar rules.

The AI Program included the following:

Twenty-four sessions including two orientation sessions. The purpose of the orientation sessions is to illustrate the concept of AI to the participants, its recent applications in learning, raise their awareness of its importance and efficiency in learning, and motivate their desire for learning.

Twenty-two sessions, one different topic for each, using some activities and applications. The topics were selected precisely to suit the participants' interests in addition to their connection and relationship with their curriculum needs. During the application, the researcher aroused a number of open-ended questions for the

participants to urge them to make interpretations of the AI world to which they are applying its activities.

Each session started with the duration of the session, its objectives, aids, and warm-up activities integrated with information about the topic then the sessions were divided into three stages lead-in, procedures, and consolidation.

Sources.

In order to prepare the program's activities, several sources were used such as the Microsoft store for Minecraft game modded by AI Grammarly program that would assist in holding discussions and posing questions created by the researcher. Moreover, the researcher used Google Play for AI learning applications.

Results

This part presents the results of the study. It is divided into three parts. The first part presents a thorough quantitative data analysis of the pre/post application results through statistical operations and the verification of the research hypotheses. Results are then explained and discussed. The second section presents a qualitative analysis of the results got from some of the participants` writings; supported by the related studies. Finally, it presents general conclusions on both the quantitative and qualitative findings.

Table (1)

Components	Mean		Std. Deviation		T- test value	Sig.	Effect size (η^2)
	pre	post	pre	post			
Reflection	6.68	13.03	5.06	4.65	6.753	0.003	0.595
Organization	10.37	14.09	5.38	4.37	6.021	0.001	0.539
Detecting and producing interpretations,	5.62	12.66	4.77	4.99	8.487	0.006	0.699
Text smoothness	4.87	12.31	4.61	4.94	8.334	0.000	0.691
Mechanics	8.63	14.88	5.64	4.14	8.455	0.000	0.698
Total degree for Writing Fluency	36.19	66.96	23.13	20.71	10.120	0.000	0.768

- Table(1) shows that the significant level is less than 0.01 in the English language writing fluency as a total score and in all its components. This indicates a statistically significant difference at the 0.01 level between the mean scores of the study participants on the pre-posttest for English language writing fluency as a total score and for each component, in favour of the post-test. This means that the HO1 should be refused. Consequently, the alternative hypothesis is to be accepted.

The effect size is calculated by using ETA squared:

Abdul Hamid A., (2016) mentions that the following mathematical formula will do the calculation of the effect size if using the T-test:

Effect size $(\eta2) = t2 / (t2 + df)$

where df = degrees of freedom , T = computed t value

And $(\eta2)$ is interpreted as follows:

• If: $(\eta2) > 0.010$, it indicates a weak effect size.

• If: $0.010 \geq (\eta2) > 0.059$, it indicates a little effect size.

• If: $0.059 \geq (\eta2) > 0.138$, it indicates an average effect size.

• If: $0.138 \geq (\eta2) > 0.232$, it indicates a high effect size.

• If: $0.232 \geq (\eta2)$, it indicates a very high effect size.

From the previous table, it is clear that the value of the effect size expressed in the Eta square for writing fluency equals (0.768), which is greater than (0,232), and this means that the effect size is very high, and this indicates that the use of AI applications has a significant impact and is very effective in developing writing fluency as a total degree for third-year preparatory school students "the research group".
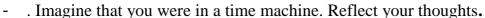
Qualitative Analysis and Discussion

In this part, the researcher will present a discussion of the qualitative data collected from some selections of the participants' writings with regard to writing fluency components and how they were enhanced. The second part of this chapter will deal with qualitative analyses of data acquired from these selections in an attempt to identify the qualitative results and provide further explanations for the findings.

Analysis of the learners' discussions with regard to the targeted WF components.

WF is essential in learning any language so it requires continuous support and improvement. There are numerous components of WF but the researcher in the current study was convinced to tackle some components of WF which are reflection, organization, detecting and producing interpretations, and text smoothness. These components were chosen for the program and developed by the participants. The researcher in this part chose some selections of the learners` writings to analyze qualitatively.

"Reflection" is the first measured component. The researcher is convinced that reflective writing is an evidence of reflective thinking which includes thinking of an idea or a topic, analyzing, illustrating ideas, and connecting them with the learners' prior knowledge. So the researcher chose some topics to stimulate the learners` ability to think reflectively such as:

- Look at the following picture. Introduce yourself and express your future dreams.
- . Imagine that you were in a time machine. Reflect your thoughts**.**

Here are some samples of the participants` writings about the first topic **"**Introduce yourself and express your future dreams" both before and after the application of the program:

- Some responses before applying the program:

"I am Adham Mahmoud. I am in preparatory 3. I am Egyptian. I want be an engineer. My favourite subject is English. I buy a company in the future."

- After applying the program:

"I`m Adham Mahmoud. I am 15 years old. I am from Egypt and I am a student in a preparatory school. My school is called Hassan Abo Bakr distinguished Governmental language school. It is in Alqanater city. I have a good family. My father is a trader and my mother is a housewife. In the future I want to be an engineer because I like building bridges and making important projects. I also hope to have a company and nice car.

Throughout the previous example of the students' writings before and after applying the program, it was noticed that most of them used very brief and few words, they also showed little or no reflection abilities, lack of details or ideas, and no development in their writings whereas after the application of the program, it was clearly noticed that the learners tended to write their answers with more details, support, and evidence which indicated the development they had on their reflection abilities in writing. They reflected their ideas clearly and linked their thoughts and dreams in a coherent way. Most of them also could support their reflection in an organized and developmental way.

The second measured WF component is "organization ".

The ability of learners to organize their thoughts and ideas is an important writing component. The instructor drew the learners` attention to the importance of not only having enough amount of ideas and reflection on these ideas but also to the inevitability of organizing these thoughts and ideas and arranging them in a logical sequence.

The researcher chose two questions that are appropriate to the participants' level as students in preparatory three. These questions were expected to measure their organization ability in writing before and after applying the program.

The first question is:
Read the passage quickly to get the general meaning then fill in the blanks with suitable words.
Foreign – store – helps- computers – subjects- communicate
with – think – uses – about – plants.
(Organization)

We learn a lot of…..1…… at school. Everything we study has some ….2……in our life. We learn Arabic to be able to tell others what we want and understand each other. We learn …….3…….languages to……4…… people from overseas and to know how they …..5……and talk..
….6……are also very important. They can do sums
quickly and…...7….. information. History tells us …...8……our country and people from all over the world. Geography tells us about,…...9….. animals and people and where they live. Exercise…….10…… us to be fit.

Some responses before applying the program:
Answers:
1- subjects   2- helps   3- communicate with
4- foreign   5- think   6-   plants
7- store   8- about   9- Computers   10- uses/benefits

After applying the program:
Answers:
1- subjects   2- helps.   3- foreign   4- communicate with
5- think   6- Computers   7- store   8- about
9- plants   10-   uses/benefits

 2- Read the following sentences and re- arrange them to form an organized paragraph:
(Organization
Someone I'm proud of
- At work, she is respected by all of her friends.
- She is a very good cook.

- I really admire her for her wonderful dishes.
-    She looks much younger than her age with short hair and a beautiful face.
1- Of all the members of my family, my mother is the person I am proud of.
- She is 40 years.
- In the end, I consider my mother the best model for me. I always love her and I will always be proud of her.
- Moreover, She works hard. She is a useful person in society.
- My mother always does the housework well.
- She often spends her free time cooking delicious dishes for us, which makes everyone in my family happy.

One of the learners' samples was as follows:
Before applying the program:

    Of all the members of my family, my mother is the person I am proud of. She is a very good cook. Moreover, She works hard. She is a useful person in society. She often spends her free time cooking delicious dishes for us, which makes everyone in my family happy She is 40 years old. She looks much younger than her age with short hair and a beautiful face. At work, she is respected by all of her friends. I really admire her for her wonderful dishes. At the end, I consider my mother the best model for me. I always love her and I will always be proud of her.

After applying the program

    Of all the members of my family, my mother is the person I am proud of. She is a very good cook. She is 40 years old. She looks much younger than her age with short hair and a beautiful face. At work, she is respected by all of her friends. Moreover, she works hard. She is a useful person in society. She often spends her free time cooking delicious dishes for us, which makes everyone in my family happy, I really admire her for her wonderful dishes. In the end, I consider my mother the best model for me. I always love her and I will always be proud of her.

In the pretest, it is noticed in the answers of the participants in the two questions that test their organization ability, that they could not pay enough attention to the importance of producing a logical sequence and arrangement of the sentences to form a coherent sentence or paragraph whereas, in the posttest, the participants seemed to be more aware of producing an organized paragraph with logical arrangement and reflection of ideas which denotes their development in the organization component after the application of AI program.

The third measured WF component is "Detecting and producing interpretations, ".

Detecting and producing interpretations means identifying and recognizing ideas or topics displayed via pictures, photos, movies, or any other media means and inferring the implicit topics or messages out of these means. They denote the learners` ability to interpret the displayed topics, showing deep interpretations and producing reasoning links between the ideas and the topic. This is expected to occur when the instructor empowers and well engages the learners in the learning process by asking them to use their senses to feel a part of the scene. One of the topics is:

"Look at the following picture.Express and explain interpretations, of what you would do to fight diseases and improve health conditions if you were the minister of health".

One of the learners' samples was as follows:

Before applying the program:

" Health problems very important topic be careful. There is diseases such as the flu and viruses. We must take medicine and go to the doctor help. If I were the minister of health, I will make new hospitals and doctors and nurses work hard to solve problems and give good medicine to ill people to help them.

After applying the program:

"Today the world is facing a lot of health problems because of the existence of many diseases which spread recently. This spread of diseases could be due to pollution, unhealthy food, and WF internet connection. . If I were the minister of health and want to fight diseases, there are many steps I should do. Firstly, I will ask social media means to increase people`s awareness of the importance of eating healthy and fresh food and avoiding eating fast food. Secondly, I will oppose fines and punishment on factories or any place that throws waste into seas or rivers and cause pollution to the environment. Thirdly, I will build more hospitals and train many doctors and nurses to use the latest forms of technology in their work to help patients to get better quickly. In the end, it is very important for everyone in society to take part in fighting diseases to have a better country with healthy people.

In the pretest, the participants responded to the topic entitled "Express and explain interpretations of what you would do to fight diseases and improve health conditions if you were the minister of health." It is noticed how the participants were not able to well explain or think deeply about the displayed short movie. They could not involve their feelings in the topic, deepen their thinking to express the whole idea or produce reasoning links between their ideas and the topic. It is also noticed that the participants did not expand their ideas during their written responses to the topic and produced very limited illustrations of the procedures they would do

to fight diseases if they were ministers of health. They wrote a lot of unclear ideas without organization or support for these ideas.

After the application of AI activities, it is noticed that the participants could think deeply, interpret the scenes they have seen and expanded their ideas. It is also noticed that a lot of the learners could illustrate health problems in an organized way and produce a logical sequence of details that handle ideas and clear vision of presenting effective solutions and suggestions to improve health problems in a case being in the position of the minister of health. Moreover, the participants showed reasoning links between their ideas and the written topic in addition to expanding the vocabulary used in their writings.

- ***The fourth measured WF component is "*Text smoothness *".*** Text smoothness *refers to the learner's ability to use various coherent sentences in writing naturally and smoothly. The learner pinpoints the important and relates ideas with natural rhythm and flow and avoids unnecessary repetitions.*

   The learner utilizes supplementary ideas which are not digressed from the topic. **The instructor posed two topics, to measure "Text smoothness ".** The first was ***Write the first impression that comes up to your mind when you read the coming phrase:***
"Covid 19 is a legend and has no effect on man`s life"
The following lines indicated one of the learners' responses before and after applying the program.
Before applying the program
   It`s wrong because there are a lot of people dead because the virus is killing them. The news on TV and radio told the people daily about the bad effect of this virus and how it caused many deaths among a lot of people all over the world.
After applying the program
   Many people have different opinions about Covid 19. Some believe that it is just a legend and there is nothing called Covid19 and has no effect on man`s life and others believe that it is a true disease that kills many people. The first impression that comes up to

my mind when I read the phrase that it is a legend and has no effect on man's life is that it is impossible to be true because a lot of people are having this virus daily and also doctors and scientists could prove that it is already existent and affects man`s life. There are also a lot of science experiments and vaccines that help to stop the spread of this killer virus. In the end, I think that Covid 19 is a real virus that can kill many people so everyone should be careful and wear face masks to be safe from this disease.

In the pretest, as clearly indicated in the previous sample, all of the learners had generally one general focused central with few relevant details and illustrations. Some students attempted to use more ideas to support the topic but still lacked coherence and smoothness in writing.

After the post-test, the learners showed a clear focused central idea. In addition to demonstrating effective use of high-quality, relevant ideas written in coherence and smoothly.

The learners responded to the second topic: Think about what would happen if robots such as Sophia had spread among our lives? Do you think they can destroy humans and replace them? Why? Why not?

Before applying the program
'' if robots such as Sophia had spread among our lives, I think they will be very dangerous and can destroy our life. They can do all the work and make people jobless and they even can kill people and destroy life on Earth so I think it`s not a good idea."

After applying the program:
'' if robots such as Sophia had spread among our lives, I think that will be a double-edged weapon. On the good side, they can do a lot of important and hard work which humans cannot do easily and thus

saving effort, time and money. Moreover, they can be a strong defense for countries against enemies. On the other hand, the spread of robots can be very dangerous and can be a threat to people`s lives if they have the willingness and the ability to create more robots and replace themselves with humans. They will also cause a lot of unemployment for many people because they will do most work instead of them. So I think the spread of robots such as Sophia can be dangerous and may destroy life on Earth.

The fifth measured WF component is "Mechanics"

The term "Mechanics" generally refers to the technical rules that form syntax and grammar. It is the norm regulating writing's techniques, such as capitalization, punctuation, and abbreviations.

Throughout all the previously mentioned samples of the learners`writing, it was clear that learners did not pay due attention to the importance of maintain well mechanics writing work. Most of them neglected using capitalization, punctuation marks and keeping the unity of tenses in writing topics.

After applying AI program, there was a remarkable improvement in their carefulness to use correct grammar forms suitable to the topics they were writing in addition to paying attention to using correct punctuation marks that regulate writing techniques.

The previous samples show the participants' deep ambitions and enthusiasm to learn through applying new strategies such as AI. It is also noticed that they had a great interest in acquiring fluency; in all of the English language abilities such as speaking, listening, reading, and writing, or in other words learning the language as on entity, through the application of new strategies. Collaborative work affected the participants` involvement in thinking deeply and visually. Supporting and competitive learning environment contributed greatly to developing the participants' acquired skills and knowledge.

Discussion of results:

Throughout the previous statistical analysis, it was clear that the proposed AI applications have a positive effect on enhancing the English WF and its components. The previous table also clarified the significant difference between the mean scores of the study participants on the pre and post-WF test and the effect size.

For calculating the internal consistency of the whole test, Alpha Cronbach and re-correction by other tutors were used. Using the T-test to detect the significance of the students' degrees between the pre-posttest for measuring the English language writing fluency as a total score and the score of each component, the effect size was calculated too by using ETA squared.

Conclusions:

The current study aimed at investigating the impact of using artificial Intelligence on Enhancing EFL Language Fluency in general, writing fluency in particular, for Preparatory Stage students. Based on the study results, it can be concluded that:

- Using AI was obviously effective in enhancing English fluency in general and each component of writing fluency in particular.
- The AI program proved its effectiveness in enhancing the learning process through engaging learners in an enjoyable active learning environment where they feel the importance of learning English in their life.
- AI will not replace teachers or their social interaction with their students via traditional teaching but it should be a part of the learning process as gamifications, VR and AR technologies.

Recommendations

According to the previous results and conclusion, the study recommends the following :

Instructors should provide their learners with more opportunities and encouragement to improve their writing fluency.

- Using a supportive learning environment has a significant impact on the learning process as it affords an enjoyable and preferable

atmosphere where learners can learn in a relaxing and successful way.

- There is obvious evidence that using AI in learning can positively affect learners` language fluency in general, and writing fluency in particular.

- AI enhances rapport among learners and more effort and ideas should be afforded to enhance rapport in the whole learning environment.

- Instructors need to explore up-to-date AI applications that contribute to the reinforcement of the learning process.

- AI learning applications should be used to develop all aspects of language fluency.

Suggestions for further research

Researchers may further put into consideration the following suggestions to explore the efficiency of AI applications in enhancing learners` writing fluency:

- Language fluency in general in the preparatory stage needs focused attention.

- Tending to use AI educational applications in the EFL learning process is very significant and should be put into consideration for creating a motivating learning environment.

- Instructors should be aware of selecting suitable and efficient types of chatbots that fulfill the needs of their learners and their pedagogical goals.

- Writing fluency could be successfully integrated with oral activities through AI applications.

- AI applications achieve great results in developing different aspects especially speaking and listening fluency so they are highly recommended to be used in further research for developing these language components.

- AI allows students with difficulties such as dyslexia or other health problems to study more effectively so it will be beneficial to implement AI tools in learning content, teaching methods and assessment.

References

- Abdel Latif, M. M.M (2013). What do we mean by writing fuency and how can it be validly measured? Applied Linguistics, 34(1), 99–105. https://doi.org/10.1093/applin/ams073

- Abolfotouh, M. (2020). Using animated films *to develop the speaking skills of student teachers of English in the light of the communicative approach* [Unpublished master's thesis]. Ain Shams University.

- Alamer, A., & Al Khateeb, A. (2021). Effects of using the WhatsApp application on language learners motivation: a controlled investigation using structural equation modelling. Computer Assisted Language Learning, 1-27. https://doi.org/10.1080/09588221.2021.1903042

- Atasoy, A., & Temizkan, M. (2016). Evaluation of secondary school students' writing fluency skills. Retrieved 18 March 2020.

- Borna, M., & Fouladchang2, M. (2018). *The Motivational Outcomes Of Connectivism Theory In EFL*. Mjltm.org. Retrieved 19 July 2022, from http://mjltm.org/files/site1/user_files_a9608a/admin-A-10-1-214-7ffc52b.pdf.

- Boraie, D., El Badry, E., & Habashy, M. (2019). Task-based learning and teaching in Egypt. In H. Reinders, C. Coombe, A. Littlejohn, & D. Tafazoli (Eds.), *Innovation in language learning and teaching* (pp. 61-83). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-13413-6_4

- Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial Intelligence trends in education: a narrative overview. *Procedia Computer Science*, *136*, 16-24. https://doi.org/10.1016/j.procs.2018.08.233

- Elaish, M. M., Shuib, L., Ghani, N. A., & Yadegaridehkordi, E. (2019). *Mobile English Language Learning (MELL): A literature review. Educational Review*, *71*(2), 257-276.

- El Sayed, E. (2020). Using a task-based program taught through the discussion method to improve secondary stage students' argumentative paragraph writing skills and self-steam. *Journal of Educational Sciences, 42*(42), 1-40.

- Fryer, L. K, Nakao, K & Thompson, A (2019). Chatbot learning partners: connecting learning experiences, interests and competence. Computers in human behaviors, (93), 279- 289

- Gayed, J.M. *et al.* (2022) "Exploring an AI-based writing assistant's impact on English language learners," *Computers and Education: Artificial Intelligence*, 3, p. 100055. Available at: https://doi.org/10.1016/j.caeai.2022.100055.
- Goel AK, Polepeddi L (2017) Jill Watson: a virtual teaching assistant for online education. Georgia Tech, Atlanta, GA.
- Jones, C. (2020). What is fluency, and how can it be taught? World of Better Learning. https://www.cambridge.org/elt/blog/2020/01/22/fluency-can-it-be-taught/
- Karkera, S., & Chamundeshawari, C. (2018). YouTube: A teaching tool to improve listening skills. *International Journal of Creative Research Thoughts (IJCRT),* 6(2), 1311-1316. https://ijcrt.org/papers/IJCRT1813041.pdf
- Khare, K., Stewart, B. & Khare, A. (2018). *Artificial intelligence and the student experience: An institutional perspective*. The International Academic Forum (IAFOR).
- Kukulska-Hulme, A. (2019). Mobile Language Learning Innovation Inspired by Migrants. *Journal Of Learning For Development*, *6*(2). https://doi.org/10.56059/jl4d.v6i2.349
- Luckin R. et al. Intelligence Unsleashed. An argument for AI in Education . Pearson. 2016.
- Ma, Yizhi & Siau, Keng L. (2018). *Artificial Intelligence Impacts on Higher Education. MWAIS 2018 Proceedings. 42.* Proceedings of the Thirteenth Midwest Association for Information Systems Conference, Saint Louis, Missouri May 17-18, 2018
- -Morony, S., Kleitman, S., Lee, Y. P., & Stankov, L. (2013). Predicting achievement: Confidence vs self-efficacy, anxiety, and self-concept in Confucian and European countries. International Journal of Educational Research, 58(2), 79–96. https://doi.org/10.1016/j.ijer.2012.11.002 [Crossref], [Web of Science ®], [Google Scholar]
- Osman, R. (2020). Mobile ESL Apps and Students Motivation: A Case Study. Retrieved 11 October 2022, from https://www.researchgate.net/publication/343821901_Mobile_ESL_Apps_and_Students_Motivation_A_Case_Study.
- Platsidou, M., & Kantaridou, Z. (2014). The role of attitudes and learning strategy use in predicting perceived competence in school-

aged foreign language learners. *Journal of Language and Literature, 5*(3), 253–260. https://doi.org/10.7813/jll.2014/5-3/43 [Crossref], [Google Scholar]

- Prince, B. (2017). Improving the self-efficacy of math learners using a direct and focused Approach to vocabulary clarification. A Project Submitted to the School of Graduate Studies of the University of Lethbridge in Partial Fulfillment of the Requirements for the Degree master of education. Propósitosy Representaciones, 7(2), 536-568.

- Rahimi, M., Zhang, L.J., 2018. Writing task complexity, students' motivational beliefs, anxiety and their writing production in English as a second language. Read. Writ. 32 (3), 761- 786.

- Rao, P. (2019). The importance of teaching language skills to the second or foreign language learners of English: A comprehensive study. *ACADEMICIA: An International Multidisciplinary Research Journal*, *9*(4), 6. https://doi.org/10.5958/2249-7137.2019.00061.2

- Rouhani, Y., Nafchi∗, A., & Ziaee, S. (2016). Applying Different Interventions to Teach Writing to Students with Disabilities: A Review Study. *Theory And Practice In Language Studies*, *6*(4), 733. https://doi.org/10.17507/tpls.0604.10

- Salas-Pilco, S., Xiao, K., & Hu, X. (2022). Artificial Intelligence and Learning Analytics in Teacher Education: A Systematic Review. *Education Sciences*, *12*(8), 569. https://doi.org/10.3390/educsci12080569

- Sánchez-Rosas, J. & Esquivel, S. (2016). Instructional Teaching Quality, Task Value, Self-Efficacy, and Boredom: A Model of Attention in Class. Revista de Psicología, 25(2), 1-20. http://dx.doi.org/10.5354/0719- 0581.2017.44966

- Suh, A., & Prophet, J. (2018). The state of immersive technology research: A literature analysis. Computers in Human Behavior, 86, 77–90. https://doi.org/10.1016/j.chb.2018.04.019

  The Internet and Higher Education, 12(1), 1–6. Barnard-Brak, L., Lan, W. Y.,

- Taguma M., Senior Analyst M., Feron E., Meow Hwee L.I.M. 2018. Future of education and skills 2030: conceptual learning framework. November. [Google Scholar]

- TAVAKOLI, P., NAKATSUHARA, F., & HUNTER, A. (2020). Aspects of Fluency Across Assessed Levels of Speaking Proficiency. *The Modern Language Journal*, *104*(1), 169-191. https://doi.org/10.1111/modl.12620
- https://doi.org/10.51817/jpdr.v2i1.203
- Tuomi, I. (2018). The impact of artificial intelligence on learning, teaching, and education. Policies for the future, available at: http://publications. jrc. ec. europa. eu/repository/bitstream/JRC113226/jrc113226_jrcb4_the_impact_of_artificial_intelligence_on_learning_final_ 2. pdf.
- Williams, M., Tang, K., & Won, M. (2019). ELL's science meaning making in multimodal inquiry: A case-study in a Hong Kong bilingual school. *Asia-Pacific Science Education*, *5*(3), 1-35. https://doi.org/10.1186/s41029-019-0031-1
- Woolf, B. P., Lane, H. C., Chaudhri, V.k., & Kolodner, J.L.(2014).AlGrand Challenges for Education. AlMagazine,34(4),66-84.doi: http://dx.doi.org/10.1609/aimag.v34i4.2490
- Van Waes, L., & Leijten, M. (2015). Fluency in writing: A multidimensional perspective on writing fuency applied to L1 and L2. Computers and Composition, 38, 79–95. https://doi.org/10.1016/j.compc om.2015.09.012
- Yoestara, M., & Putri, Z. (2019). Podcast: *An alternative way to improve EFL students' listening and speaking performance. Englisia Journal, 6*(1), 15. https://doi.org/10.22373/ej.v6i1.3805

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