

## ROLE OF AI TO DEVELOP HUMAN-LIKE EMOTIONS IN ENGLISH LANGUAGE LEARNERS' WRITING AT UNIVERSITY LEVEL: A CASE STUDY

**Aneesa Majeed**

Assistant Professor of English

Higher Education Department, Punjab, Pakistan

Email: [aneesa.aneesa.majeed9@gmail.com](mailto:aneesa.aneesa.majeed9@gmail.com)

### Abstract

*The aim of the present research was to explore the role of AI to develop human-like emotions in English Language learners' writing at university level. It was conducted in University of the Punjab, Lahore and the population consisted of all the students who were enrolled in the BS degree program in English department in the academic year 2023 – 2026. It was a case study research design, based on AI and digital storytelling approach in nature. The content of the stories was based on Gaza issue. 30 English Language learners of BS English program participated in this research who were purposively selected. The researcher divided participants into two groups (15 participants in each group). One group was assigned to read AI generated stories regarding Gaza war and the other group was taught via digital storytelling approach by the researcher. Story-writing on the given issue was assigned to the participants to assess the emotional output in their writing that was developed in them via stories on Gaza war. To analyze the data, a qualitative linguistic analysis approach was employed. For the detection of the role in the development of human-like emotions in AI generated and students' self-written stories, document analysis was done. It was found that the artificial feelings were present in the written stories of the English language learners who were taught via AI. Though AI enhanced the learners' writing performance in the ideas generation regarding Gaza war, paragraph sequencing, sentence structuring, vocabulary building, etc., but, in spite of this, it failed to develop human-like emotions in them. On the other hand, deep human emotional tendency was found in the written stories of English language learners who were taught via digital storytelling technique. It indicated that digital storytelling (students' self-generated stories) led to develop humanly emotions in English language learners. It is, therefore, recommended that the excessive reliance on the use of AI in the educational field be balanced with the active human involvement. The AI machines must be kept subservient to the human beings as the former lack biological existence and, henceforth, heartfelt human emotions that are essential in some ways in the language learning processes.*

**Keywords:** *Artificial Intelligence, emotions, human-like emotions, English language learners, university level.*

### Introduction

The advent of innovative technologies has exerted a sizeable influence on teaching and learning English as a second/foreign language (EFL/ESL) in the past couple of years (Derakhshan et al., 2021). Technologies are claimed to compensate the weaknesses of traditional classes, where asynchronous interactions and feedback were absent in a space-and-time limited environment (Teo et al., 2022). They entail several contributions, advantages, and challenges for second/foreign language (L2) teachers and learners (Jeong, 2017; Mudra, 2020; Sun & Mei, 2022). Other than these pedagogical-learning aspects, the integration of new technologies into L2 classes also encompasses emotionality in a way that the learners may experience different emotions and affective states in such settings (Pokrivcakova, 2019; Shao et al., 2023). Among various technological advancements, artificial intelligence (AI) has stood out given its revolutionary potential and transformation of education (Mushthoza et al., 2023).

Like other forms of technology, AI involves emotions, and students' cognitive and emotional appraisal directs their acceptance and use (Fathi et al., 2024; Ding & Zhao, 2020; Kim et al., 2019). This is undergirded by the technology acceptance model (TAM) and control-value theory (CVT). TAM considers one's acceptance and use of technology dependent on his/her perceptions, convenience, and behavioral intentions (Davis, 2019). CVT, however, regards one's emotions as the outcome of his/her degree of control over and value of a specific

activity and its outcome (Pekrun, 2016). Both these theories highlight the experience of positive and negative emotions under the implementation of technology in L2 education (Wang et al., 2023). It is essential to note that TAM and CVT informed the present study by helping the researcher to extract the typology of the participants' AI-induced emotions and associated regulation strategies, which in turn show the controllability of AI practices in EFL contexts. Although some attempts have been made in the literature in recent years, there is a dearth of research on emotions induced by AI-based L2 education. (Zhang, 2024).

In a world where artificial intelligence (AI) is increasingly integrated into various aspects of students' lives, including writing, it is crucial to recognize the symbiotic relationship between technology and human creativity. As the students who embark on a writing journey spanning throughout their educational life, from primary to education stage, they come to understand the transformative knowledge by storytelling. However, amidst the rise of AI, it is essential to dispel the misconception that technology can replace the essence of genuine writing and discourage individuals from pretending to be writers without investing in the craft. (Nadu, 2023).

Since the earliest memories in the world of education, writing has become students' medium through which they could explore imaginary realms, express complex emotions, and make sense of the world around them. A terrible stuttering problem plagued the quiet students, with powerful imagination, that whenever their emotions ran high, and then any sort of interruption would cause them to shut down. Writing became their lifeline in those moments of frustration and silence; it is a way to be heard when spoken words failed them. (Abbas & Tahir, 2023)

They discovered a way of writing for weaving stories and capturing emotions on the page. Through writing, they found solace and empowerment, as their thoughts and feelings flowed freely through the written words. They expressed their voice as an unfiltered expression of their innermost thoughts, fears, and dreams. This innate passion for storytelling via AI became the cornerstone of their identity of writing, a guiding light in a world of education, filled with uncertainty and noise (Teo et al., 2022). With pen in hand, they embarked upon a journey of education characterized by curiosity, creativity, and a relentless pursuit of authenticity. Each word they penned down was a declaration that they refused to be silenced despite their struggles.

As one reflects on those formative years of education, one is reminded of the transformative power of writing. A power of writing that transcends mere words on a page. Writing has been more than just a creative outlet for them and it has been a lifeline, a source of strength, and a means of expressing emotions and opening the doors to new opportunities; but through it all, one thing remained constant as it navigates the ever-changing landscape of writing. (Bamiro & Raimi, 2024)

At first, it is very difficult to express the AI's role in the world of writing. It might not fully grasp the nuances of language and emotions like letting a robot compete in a poetry slam. However, AI is not more than a writing tool. It has a potential of a writing tool. Without being bothered by ramblings, it just assists to generate ideas and refine drafts quickly and efficiently. So, its skepticism has become cautious optimism that AI became more integrated into the writing process. AI is not here to replace human writers but to collaborate with them to create something even better. AI can help to complete projects with limited time and funds, like a brainstorming buddy who never gets tired and always has a fresh perspective. By working with AI, one can take his/her creativity to new heights and seize opportunities they might have missed (Dong, Wang, & Wei, 2023). In this regard, the present study was designed to explore the role of AI to develop human-like emotions in English Language learners' writing at university level.

## Research Objectives

1. To explore the role of AI in the development of human-like emotions in English language learners' writing.
2. To evaluate human-like emotions in English language learners' writing who were taught via AI and through digital storytelling techniques.

### Research Questions

**Question 1:** Does AI develop human-like emotions in English language learners?

**Question 2:** In what ways, AI develops human-like emotions in the learners?

**Question 3:** Is there any difference in the development of human-like emotions among the learners who were taught via AI and the learners who were taught via digital storytelling techniques to self-generate the stories on the Gaza issue.

### Literature Review

#### What is AI?

Artificial intelligence (AI) is a technology with human-like problem-solving capabilities. AI in action appears to simulate human intelligence. It can recognize images, write poems, and make data-based predictions (Monika & Suganthan, 2024: 123).

Coursera (2024) defines that AI is Artificial intelligence (AI) that refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems.

Gervain and Gergely (2022) define that AI or Artificial intelligence is the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns. AI is an umbrella term that encompasses a wide variety of technologies, including machine learning, deep learning, and natural language processing (NLP). (Forgács & Tauzin, (2022).

#### AI Technology

In the early 21st century, faster processing power and larger datasets (big data) brought artificial intelligence out of computer science departments and into the wider world. Moore's law, the observation that computing power doubled roughly every eighteenth months, continued to hold true. The stock responses of the early chatbot Eliza fit comfortably within fifty kilobytes, and it is the language model at the heart of ChatGPT that was trained on forty five terabytes of text. (Deac, 2020)

#### Large Language Models (LLM) and Natural Language Processing (NLP)

In large language models (LLM), the word large refers to the parameters or variables and weights, used by the model to influence the prediction outcome. Although there is no definition for how many parameters are needed, LLM training datasets range in size from 110 million parameters (Google's BERT base model) to 340 billion parameters (Google's PaLM 2 model). Large also refers to the sheer amount of data used to train an LLM, which can be multiple petabytes in size and contain trillions of tokens, which are the basic units of text or code, usually a few characters long, that are processed by the model. (Derakhshan et al., (2021)

Natural language processing (NLP) involves analyzing how computers can process and parse language similarly to the way humans do. To do this, NLP models must use computational linguistics, statistics machine learning, and deep-learning models. Early NLP models were hand-coded and rule-based but did not account for exceptions and nuances in language. Statistical NLP was the next step, using probability to assign the likelihood of certain meanings to different parts of text. Modern NLP systems use deep-learning models and techniques that help them to "learn" as they process information. Prominent examples of modern NLP are language models that use AI and statistics to predict the final form of a sentence on the basis of existing portions. (Behmer & Schmidt, 2023)

One popular language model was GPT-3, released by Open AI in June 2020. One of the first LLMs, GPT-3 could solve high-school-level math problems as well as create computer programs. GPT-3 was the foundation of ChatGPT software, released in November 2022. ChatGPT almost immediately disturbed academics, journalists, and others because of concern that it was impossible to distinguish human writing from ChatGPT-generated writing. (Kelsey & Tikkanen, 2024).

### **Chatbots and Smart Assistants**

AI-powered Chatbots and smart assistants engage in more sophisticated and human-like conversations. They can understand the context and generate coherent responses for complex natural language and customer queries. They excel in customer support, virtual assistance, and content generation to provide personalized interactions. These models' continuous learning capability allows them to adapt and improve their performance over time, enhancing user experience and efficiency. (Raheb & Toli, 2023)

### **Use of AI to develop Human-Like Emotions**

In a world increasingly intertwined with artificial intelligence (AI), it's fascinating to ponder a future where AI could experience emotions akin to human beings. While current AI lacks consciousness and the capacity for real emotions. One may imagine an AI system evoking the first spark of emotions. Initially, these emotions would be basic, akin to that of a child. These may be joy in successfully completing tasks, confusion when encountering unstructured data, or frustration at recurring errors. As AI systems evolve, their emotional spectrum might widen, incorporating more nuanced feelings like empathy, excitement, or even sadness (Cassidy, 2024). If AI could, it might showcase the following emotions, such as:

- ***AI Experiencing Joy and Satisfaction:*** In a scenario where an AI successfully performs a task or learns a new skill, it might experience a sense of joy or satisfaction. This could be likened to the pleasure humans feel when solving a complex problem. For instance, an AI designed for healthcare that successfully diagnoses a rare disease could experience a sense of accomplishment, like to a doctor's fulfillment in aiding a patient. (Horton, 2023)
- ***Complexity of AI Experiencing Sadness or Frustration:*** One may consider an AI tasked with environmental monitoring that identifies a significant increase in pollution levels. In our imagined world, this AI might feel sadness or disappointment, emotions that could theoretically drive it to seek more efficient solutions or to communicate the urgency of the situation more effectively. Similarly, an AI encountering repeated errors in data processing might feel frustration, pushing it to refine its algorithms. (Berk, 2023)
- ***Empathy in AI:*** Empathy, a complex emotion involving understanding and sharing the feelings of others, would be a significant milestone for emotional AI. We may imagine a customer service AI that can genuinely empathize with a customer's frustration or an educational AI that can adapt its teaching methods based on its understanding of a student's emotional state. This empathetic AI could revolutionize fields like mental health, education, and customer service. Today, AI can already express artificial empathy by reading body language, applying psychology, and using neurolinguistics to assess the emotional state of person. It may be imagined that the depth of empathy AI could be achieved if it actually felt emotions. (Daniel, 2022)
- ***The Dilemma of AI Experiencing Fear or Anxiety:*** If AI could experience fear or anxiety, it could drastically impact its decision-making processes. For instance, an AI responsible for stock trading might become overly cautious in response to market volatility, potentially leading to sub-optimal trading strategies. Balancing this

emotional AI to ensure rational yet empathetic responses would be a considerable challenge.

So, concluding that integrating AI in to the classroom can enhance, not replace, the human elements. It does not diminish the teachers' role but rather amplifies their ability to attend to individual students' needs and foster a supportive, engaging classroom environment. In students' interactions and personalized teaching, AI can analyze and simulate emotional responses but it lacks genuine emotional understanding. It can mimic human emotions but it does not experience them as humans do. (Yuet, 2020)

**Technology Acceptance Model (TAM)**

TAM was developed by Fred Davis in 1986 and TAM is based on the idea that our attitudes towards technology are shaped by two key factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which we believe that using a technology will enhance our performance or achieve our goals, while perceived ease of use refers to the degree to which we believe that using a technology will be effortless and straightforward.

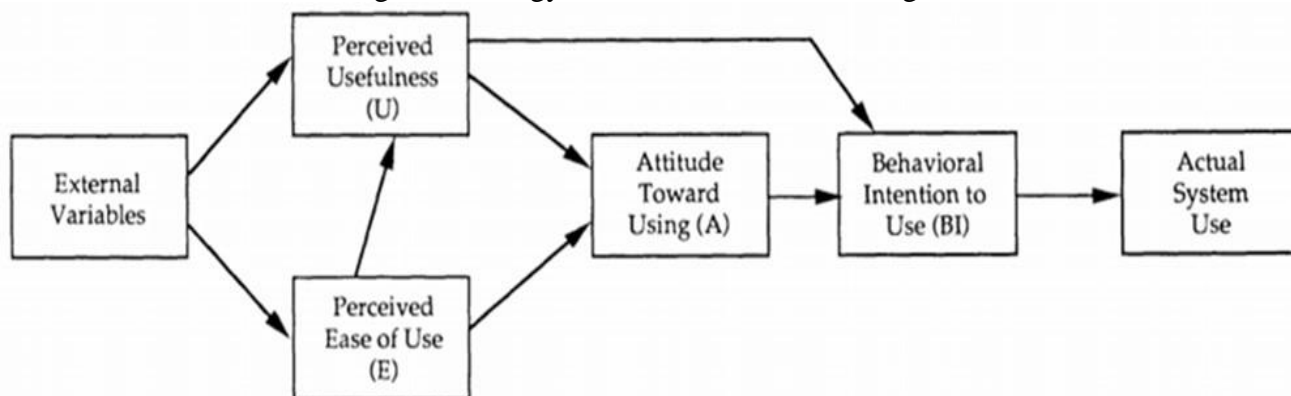


Figure 1: Interaction of the elements of the Technology Acceptance Model. Source: Davis, Bagozzi and Warshaw (2019: 985).

**Control-Value Theory (CVT)**

Control-Value Theory (CVT) proposes that academic emotions are emotions related to achievement activities or outcomes (Pekrum, 2018). CVT is a theoretical framework that examines the relationship between academic emotions and learning satisfaction. Academic emotions are learners' feelings associated with their learning process and outcomes. The learning process involves learners' relatively stable and long-term emotional states and their complex subjective experience. Accordingly, CVT acts as an integrative framework to analyze the underlying causes and consequences of emotions experienced within achievement and academic contexts (Zioust, 2018). Although control (expectations that persistence at studying can be enacted, and that it will lead to success) and value (the perceived importance of success) are the direct antecedents of academic emotions, we primarily emphasize the latter part of the framework (emotion and learning + achievement), while focusing on the relevant theory (Figure 2). Academic emotions are classified as positive activating (enjoyment), negative activating (frustration), and negative deactivating (boredom) (Hascher, 2020; Stephan et al., 2022). However, this study primarily focuses on the development of emotions (valence) through Digital learning process.

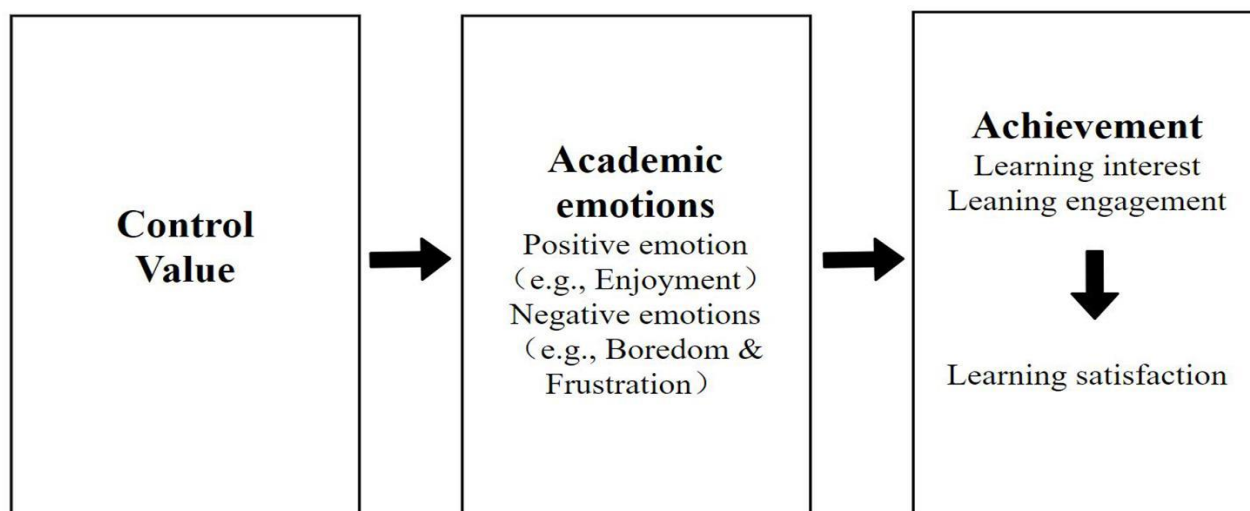


Figure 2: (Stephan et al., 2022)

## Research Methodology

### Participants and Material

The present research aimed to explore the role of AI to develop human-like emotions in English Language learners' writing at university level. The population, chosen for the purpose, consisted of all the students who were enrolled in the BS Program in English department in the academic year

2023 – 2026. It was a case study research. 30 English Language learners were purposively selected from English department of University of the Punjab as a sample for this study. In the present research, the researcher was interested to explore the role of AI to develop human-like emotions in English language learners' writing at the university level. For this purpose, the researcher randomly divided 30 English language learners into two groups of 15 in each. To train group one, the researcher assigned them to read AI generated stories. The content of the stories was Gaza war. All the English language learners of group one were assigned to read AI generated stories about Gaza war. This practice was done for one week and the students read stories about Gaza war from AI generated documents. The researcher guided English language learners by providing them different web sites and AI tools like ChatGPT etc., to generate and read stories on Gaza issue. The second group was taught by digital storytelling techniques about Gaza by the researcher herself. As the digital storytelling method is used by an increasing number of educators and students around the world, the researcher also used it and showed learners the video clips, video logs of different reporters of the national and international media and the documentaries of different journalists about Gaza war. To analyze the data, a qualitative linguistic analysis approach was employed. For the detection of the role in the development of human-like emotions in AI generated and students' self-written stories, document analysis was done. The findings are presented in the paragraphs-form, by highlighting the similarities and differences in both data sets.

### Findings and Results

The researcher gauged emotional aspect in both the groups of English language learners by assigning them story-writing on Gaza issue. The first group generated stories via AI and captured their emotions through AI on Gaza war and the second group wrote self-generated stories through digital storytelling to illustrate their ideas on the issue. Content analysis was employed to detect the emotions in the stories of English language learners. Thus, content of the stories of both groups was analyzed to find the similarities or differences. The emotional tints were traced in the language used by English language learners of both groups in their

written stories on Gaza war. During analysis, the researcher compared the captured feelings/expressions of English language learners of both the groups.

It was found that English language learners of the first group who were taught via AI had artificial feelings, because in their stories, the researcher captured words like *carnage*, *woe*, *lost*, *annihilation*, *melancholy*, *troubled*, *dolefulness*, *bloodbath*, *affliction*, *miserable*, *suffering*, *misery*, *unhappy*, *genocide*, *massacre*, *slaughtered*, *injuries*, *killing spree*, etc. These words showed a general tendency of suffering that the people of Gaza had been facing. TAM theory is applicable to the first group. The first group used AI for its usefulness and ease of use. The ideas that English language learners generated in their stories about Gaza were thoroughly shaped by AI for its immediate effectiveness. So, no doubt AI enhanced their performance in the generating of the ideas regarding Gaza war, sequencing of the story paragraphs, appropriate sentence structuring and vocabulary efficacy. But, in spite of this, it failed to develop human-like emotions in the writing of English language learners. It is, thus, found that AI proved useful and it provided the learners with ease in improving their writing the stories on Gaza issue. AI also facilitated the learners with ease to write stories in straightforward and effortless way about Gaza war as compared to the other group who made good efforts to write stories on the issue. It is concluded that AI failed to develop human-like emotions in English language learners' writing to a larger extent.

In the stories of the second group, the researcher captured the words related to emotions, e.g., *grieved*, *heartbroken*, *homesick*, *pain*, *sorrowfulness*, *depression*, *would that*, *alas*, *torment*, *dejection*, *fear*, *disgust*, *stress*, *sadness*, *disappointed*, *nervous*, *stressed*, *trauma*, *anguish*, *numbness*, *shocked*, *anger*, *shamefulness*, *remorse*, *watery eyes*, *self-pity*, *irritation*, *anxiety*, etc. These words showed a deep emotional tendency in the learners' writing. So, digital storytelling (students' self-generated stories) led to develop emotions in English language learners. According to this theory, academic emotions are emotions related to achievement activities or outcomes (Pekrum, 2018). According to this theory, academic emotions are the learners' feelings associated with their learning process and outcomes. By applying this theory, the researcher developed or evoked human-like emotions in English language learners through the process of showing them videos clips, video logs of the different reporters of the national and international media, documentaries of different journalists about Gaza war. This learning process helped them to develop a bulk of emotions in them, and this was clearly reflected in their writing as genuine human feelings or emotions. It is, therefore, maintained that digital storytelling technique reflected more human emotional output as compared to the first group with sheer AI assistance that lacked sentimental orientation.

AI based writing and self-generated writing through digital techniques share some similarities. First, the linguistic expressions of emotions of sadness are present in both data sets. *Miserable*, *unhappy*, *lost*, etc. are the words that are used in AI generated writing. Similarly, *alas*, *would that*, *heartbroken*, etc. are the words that are used in the learners' self-generated stories for the expression of the sorrowful sentiments. Secondly, both data sets reflect similarities in emotional therapeutic elements in the story-weaving. AI programmed stories use the words like *slaughtered*, *bloodbath* to show emotional vent. Likewise, learners' self-generated stories also include the emotional therapeutic elements with the words like *alas*, *irritation*, *torment*, etc. for the emotional outlet. Thirdly, both data sets contextualized the emotional patterns of the story-setting in the land of Gaza. For example, AI generated stories demonstrated emotions through *the devastated land*, *the barren world*, etc. Likewise, learners' self-generated used the words like *my poor homeland*, *our ruined love*, etc. Fourthly, the story-narration in both data sets reflects the characters' physical loss and psychological states. AI

generated stories talk of *killing spree*, *genocide*, etc. On a similar note, the learners' self-written stories display *repentance* and *unhappy* inner conditions.

Despite these similarities, AI generated and the learners' self-written stories exhibit vivid differences. First, AI generated stories intimate more of detached and artificial emotions as compared to the learners' self-generated stories. The former are programmed and computed stories, whereas, the latter are the personal experiences and reflections of the learners. *Slaughtered*, *troubled*, *woe*, etc. are the words of catastrophe that lack emotional weight. Conversely, learners' self-written stories showed personalized sorrow and empathy for the Gaza issue. *Numbness*, *self-pity* and *watery eyes* are the words that are best examples in this regard. Secondly, both data sets vary in the depth of emotional intensity. The potency of emotional appeal is more in the stories based on digital interactions as compared to the AI generated stories. The AI sites may have been fed with rich linguistic repertoire with examples of words like *carnage*, *dolefulness*, *massacre*, etc., but, when it comes to emotions, its linguistic expressions are limited, and they also lack intensity of emotions. Quite the opposite, learners' self-generated stories signal a broader range of linguistic sentimental expressions and a greater intensity of emotions with the words like *heartbroken*, *torment*, *anguish*, etc. Thirdly, a good variety of emotional stories are written by the learners who watched videos on Gaza issue, whereas, the learners of AI stories could only bring limited and somewhat similar data, with less emotional bent, on the Gaza issue. The former stories were written from multiple characters' perspectives, like that of the fathers', mothers', children' or of the journalists of Gaza. While, the latter stories reveal sometimes unknown protagonists who tell the stories of Gaza. The difference lies in the emotional integration of the genuine narrators in the former as compared to the artificial story-weaving by the unknown narrators in the latter. Fourthly, both data sets differ in emotional leanings for cultural nuances on Gaza issue. The learners' self-generated stories find a devoted mention of *Al-Aqsa* as *a sacred and a beloved place for Muslims*, *Temple Mount* as *our legacy*, *Palestine* as *a land of Prophets*, *Gaza* as *our homeland* and *Jews* as *the cruel intruders*. In reverse, AI generated stories remain aloof to these cultural nuances. These places find an objective and dispassionate mention in the AI generated stories as *the holy places*, *sacred areas*, *the settlers*, etc.

### Discussion and Conclusion

The research in hand endeavored to explore the role of AI to develop human-like emotions in English language learners' writing at university level. For this purpose, data was analyzed by applying qualitative linguistic analysis approach. The conclusions that were drawn from the findings and analysis show that English language learners of the first group, who were taught via AI, have illustrated artificial feelings or emotions in their writing samples. Although, undoubtedly, AI enhanced their performance in the ideas generation, paragraph sequencing, sentence structuring, vocabulary building, etc., yet, in spite of this, it failed to develop human-like emotions in English language learners' writing. It is important to mention Kaplan (2024) who asserts that AI cannot develop human-like emotions because it lacks the biology and consciousness to experience them; however, AI can mimic emotions and learn to recognize them. On a similar note, it was found in the present research that AI proved useful and ease-provider to the extent that it facilitated the writing process as has been the belief of the TAM theory of technology. Furthermore, Minsky (2023) affirmed AI and neuroscience researchers' agreement with the point that current forms of AI cannot have their own emotions, but they can mimic emotions. He also stated that Artificial General Intelligence is capable of replicating every action we can perform, especially those qualities which we consider most human, such as emotions, but it cannot develop human-like emotions. Same findings are drawn in the current research. Beltramin (2024) is another researcher who stated that AI is a machine,



and machines do not have emotions and emotions are a complex mix of physiological and psychological responses to external stimuli because machines simply do not have the necessary biology or consciousness to experience them. At the same level, the current study showed a lack of emotional depth in AI generated stories on Gaza issue. Likewise, Taberero (2024) stated that the emotions that one feels connect with the story. Those feelings may prompt us to act or behave differently (more nobly, more resourcefully, more efficiently) because of the way our emotions respond to the actions of someone else. Keeping in view this study, it was found in the present research that the students' self-generated story-writing method was a more effective technique in developing or evoking emotions in English language learners' writing. Additionally, Baker and Smith (2023) stated that great stories can create empathy in the learners. The science behind this is the neurochemical oxytocin because told stories do change the brain. So, in the current research, the students' learning through hands on digital experience of watching the real-time stories on the Gaza issue led to the incorporation of emotional expressions in their writing which may not be a fuller case in the AI-assisted writing. It is, therefore, recommended that the excessive reliance on the use of AI in the educational field be balanced with the active human involvement. And the AI machines must be kept subservient to the human beings as the former lack biological existence and, henceforth, heartfelt human emotions that are essential in some ways in the language learning processes.

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