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REVIEW ARTICLE

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The role of artificial intelligence in generating Arabic neologisms: A study of gaming localization

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ABSTRACT

This study examines the use of Arabic neologisms in the Arab gaming community. It analyzes Personal Computer (PC) and console games such as Fortnite, Call of Duty, and Minecraft to shed light on the application of Artificial Intelligence (AI). It focuses on introducing, promoting, and determining Arabized neologisms in gaming terminology. The study shows the nature and size of this linguistic transformation, as well as the types of word-formation processes which contribute to it. The data for this research were collected from two sources: (1) the responses of 400 school and university (undergraduate and postgraduate) students to a limited set of questions. (2) live and interactive conversational exchange with the gaming community. The study shows that gamers use these neologisms for practicality and convenience, accuracy and relevance, trendiness and internationalization, and the lack of equivalence in the Arabic language system. Further, the following processes, which mark the integration of neologisms into the Arabic language system, are identified namely, loan blends, syntactic changes, morpho-syntactic changes, phonemic changes, abbreviations, and clipping. This study aims to provide an understanding of how contemporary language, particularly in the AI gaming community, is modified and to serve as a template for future research.

KEYWORDS: artificial intelligence (AI), lexical semantics, neologism, word formation process

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1. Introduction

The expansion of Artificial Intelligence (AI) has influenced language processing, localization and reshaping, especially in gaming communities. Creating and shaping neologisms is not new; it is a continuous process. It continuously arises out of many areas, history and sociocultural factors which motivate the expansion of language terms. While possible new coinages fall the wayside, others gain ground with popular acceptance (Crystal, 2006; Aitchison, 2012). With the emergence of video games, specifically the social networking feature updates, connection, interaction and communication between youth are constantly experienced. Regardless of their demographic distance, communication is achieved. The recent updates in AI gaming allow players to engage for collaborative play, which results in community building. Such games, such as virtual world ones and chats, function as a social platform that intends to permit interactions. Therefore, new words and expressions appear through such an innovative feature. The younger generation adapts to these new words and rise for it trendiness and ear-catchiness.

Some of these terms may have entered the mainstream language, but due to the slow speed of change, these changes likely took generational areas (Álvarez De Mon Rego; Álvarez-Bolado Sánchez, 2013). Active and adaptable languages integrate lexical entries emerging from technological innovation and scientific advancement (Cangelosi, Metta, Sagerer, Nolfi, Nehaniv, Fischer, Tani, Belpaeme, Sandini, Nori, Fadiga, 2010). Languages maintain adaptaion through the following methods through the following methods to align with progression and stay relevant in science and technology: (1) coining their own lexical and functional equivalents of foreign language terms, (2) incorporating the new source language in their lexical system as a neologism, with some minor phonemic, morphological, or syntactic changes to be customized to the TL linguistic norms (Pepper, 2020).

According to Moore (1998), his law establishes a law that the quantity of data thrown by an AI model is approximately doubled every two years. Video games are AI models, and one of their most influential subdivisions. It allows players to interact with a closed system through predefined rules involving a competitive or recreational (either alone or collectively) goal. AI-driven video games apply artificial intelligence to improve gameplay by creating intelligent non-player characters (NPCs) and environments that are interactive. This interactivity allows for more immersive and responsive gaming experiences (AI in Video Games Columbia University, 2022). AI-driven video games are integrated into both single-player and multiplayer, which helps to adapt their flexibility and impact on modern gaming. In the former, AI is often used to create adaptable and realistic experiences, such as dynamic enemy behavior, procedural generation, and lifelike NPC interactions. In the latter, AI enhances training modes, simulates human-like opponents, and manages dynamic in-game events, improving both player experience and skill development. This study focuses on the former modal.

The present study investigates the effect of AI-driven video games on discourse. It attempts to (1) come up with a sample of the most common English terms integrated into the Arabic system 'neologisms', (2) probe into the nature of such terms and what makes them distinct, and (3) identify the morphophonemic changes that the neologisms have undergone once being integrated into the Arabic language lexical inventory.

2. Literature Review

In recent years, AI has become one of the most leading resources of entertainment, knowledge achievement, creating ideology and neologism shaping. While few studies have obviously explored the connection between AI neologisms and language evolution, a sustainable body of research pointed towards literature as a starting point for a large number of coinages and word formation to understand how new terms emerge and gain control (Bauer, 1983).

Johnston (2021) explored the adoption and spreading of neologisms within online gaming communities, analysing terms such as pog, scuffed, cracked, grief, inting, and bidet. He investigated their integration into everyday language. His study highlighted the evolution of gaming culture and technology across three generations: console gaming, computer gaming and mobile gaming. Rego E Sánchez (2013) analyzed five Spanish gaming terms, such as sense neologisms and existing words with meanings in gaming. Their study examined their specialized usage and collocations. It revealed how these terms developed different meanings in the video game context.

Other studies have also looked at many aspects of word formation; they focused on how technology

influences language expansion and creates of new terms. For example, Ahmed (2000) studied new science dictionaries that highlighted the impact of science and technology on language. He focused on the expansion of new words and grammatical changes. He claimed that affixation is and essential tool for forming new words. Lehrer (2003) noted that new words are entering the English language at an increasing rate, driven by the need to name new concepts and the emergence of trendy terms that attract attention. Zhang E Zhang (2013) highlighted that as a result of the use of the internet, the combination of words generates new meanings of hadiths. They considered that the semantic variables formed by digital societies stem from the dynamic growth of linguistic energy. The advent of new science on the internet has led to diverse and creative word formation processes, which reflect the dynamic and adaptable nature of language, specifically in digital communication. Liu E Liu (2014) observed that the most common word-formation process of netspeak neologism is compounding, blending, applying affixation, old words with new meanings, acronyms, conversion, and clipping. Nkhata E Jimaima (2020) discussed the processes of new word creation on social media, particularly in Facebook posts. They stated that neologism is structured by features of such context. Crystal (2003) explained that new contexts in situations related to technology result in the new words and expressions formation. Since this phenomenon is apparent in the context of gaming, new expressions are being borrowed and adaptedforming neologisms. Netizens, as Hauben and Hauben (1997) referred to internet users and given the community the name Netizens. Apparently, Netizens and gamers come up with expressions to convey their intended meanings more effectively. These linguistic innovations fulfill their communicative function (Gerrig & Gibbs, 1988).

Research into language in digital communities offers crucial knowledge concerning the formation of identity. As Borg (2003) explained, discourse communities are groups that share common goals and purposes and rely on communication to achieve them. The rapid growth of digital communication has significantly influenced the use of Arabic, particularly on social media. Many studies have examined how neologisms expand in Arabic. Hamdan (2021) analyzed social media tools and conducted a survey on university students. His purpose was to identify the common words that are used throughout social media platforms. He found clear word formation processes such as loan blends, syntactic shifts, morphosyntactic changes and phonemic adaptations. Thawabteh (2017) considered the translation of English word used in similar situations into Arabic. He focused on the need to be familiar with the new terminology to bridge communicative and cultural gaps. Khrisat and Mohamad (2014) focused on the syntactic and semantic transformation that occurs as foreign words are integrated into Arabic. These studies illustrate the importance of language adaptation. AL-Momani and Maabreh (2024) examined how the students' academic achievement was influenced by students' technological inventions and trends. They stated that digital platforms address the growing linguistic landscape, which is shaped by technology and gaming culture.

This study is significant for its different method to neologisms used AI-driven gaming. This study is the first report to consider the terms that are newly evolving ecosystems included in interactive, AI-driven game situations. A Mixed-Method Research method was employed for collecting and analyzing data modes through a questionnaire and interview study, which gives a solid basis for the findings to be interpreted. The findings offer a detailed perspective on how players create and perceive neologism, particularly in the frame of AI, which played a prominent role. Although the research presented in Johnston only includes linguistic results for the swayed level of the growing loser, the subject of AI-driven influence is not juxtaposed in the study. The present study seeks to find answers to the following questions:

1. What are the most commonly used AI-driven video game neologisms among Arab gamers?
2. Why do Arab gamers adopt and use AI-driven neologisms?
3. What are the most common morpho-syntactic changes and word formation processes affecting these neologisms?

3. Methodology

The study applies a mixed-method research design. First, the study involved 400 participants (gamers) who provided 2,941 responses. They were Arab gamers enrolled in different academic levels in educational institutions. The participants (males and females) were aged between 9 and 24. The participants were selected randomly, regardless of gender. The selection of the participants was based on the researchers' belief that, at

this age, they would contribute to the study's objective, as it has been observed that these age groups spend the most time playing video games, particularly games powered by AI. The participants provided data through a questionnaire form.

The questionnaire consisted of two parts. The first part of the questionnaire collected demographic information, namely, age and whether the participants played and interacted with video games. This was done to confirm that participants possess the relevant knowledge for the study. The second part involved asking them to provide game-specific terms and requesting participants to use them in context, indicating their meaning. Additionally, the researcher requested participants to list their preferred video games, ensuring that these choices were interactive and aligned with the study's focus on examining terminology within AI-driven games (see Appendix).

The list was developed by compiling all the responses and removing any duplicate entries. Moreover, some of the terms were included in this list according to what the researcher observed during live PC and console game environments. Once this step took place, a total of 140 refined terms were obtained where no single term was repeated. Validation of the Refined List The refined list was presented to 20 other participants of the same age group and characteristics as that of the first group, who were all gamers in advanced levels, in order to cross check its validity. This was an important step to cross check the terms for their validity, accuracy and reliability and to m~~ake sure they are relevant to the context of experienced gaming participants. The researcher then conducted individual interviews with each of those participants. During these interviews, each word from the refined list was revised. Each interview lasted for approximately 2-3 hours. The meaning of the term in the game context was inquired, and further, the possible usage or relevance of the term in daily life was discussed, if applicable. Through~~ this approach, the researcher was able to gather a detailed understanding of each term, thereby making sure that the participant's interpretation and usage of each term were fully explored and accurately recorded.

4. Data Analysis

The data consisted of 140 neologisms collected from 400 responses from the participants (gaming audience). The participants' responses were provided in a list representing the most commonly and frequently used neologisms among the gaming audience. As mentioned earlier, the participants' responses were mainly utilized as a control group for cross-checking and verification purposes to maintain the validity and authenticity of the data collected from AI-driven video games. This is in addition to seeking answers to the two research questions mentioned above. Quantitively and qualitatively, the current study is delegated to answer the two questions that guided research in this work.

The cross-checking method of comparing the two databases was fundamental in ensuring the results' reliability and validity. The results showed that near-perfect identification of neologisms was detected when analyzing the data. For example, videogames-based terms such as AFK. aura, chillax, pro, nerf, among many others, have been shared by both groups, especially the ones that are socially used terms which were so frequent in the participants' responses were detected in the lists of the two data collection sources, as the word lists in the subsequent sections will show.

The set of data collected from students focused on neologisms in the field of AI-driven video games as one package. The data were then divided into two subcategories: (1) emotional and social context terms and (2) technical and performance-based context terms. Although the boundaries between the two are often fuzzy, the author was interested in exploring the effect of the relatively AI-driven video game terms in subcategories, adding to the already existing and perhaps more established video game-based neologisms which have been recent research interest.

5. Results and Discussion

The analysis exposed significant trends in the development of Arabic neologisms. Data analysis was based on both quantitative and qualitative methods. Data consisted of 2,941 responses from 400 participants, where repetition was considered in the raw data. After compiling the raw data into a single list, it was refined by eliminating duplicate entries to yield an inventory of 140 terms. Regarding the first research question, an overall analysis of gaming terms is done, which intends to identify the most frequent AI video game terms. Table 1 shows the refined list with frequencies. This should provide a structured overview of the most common neologisms as used within PC and console gaming. Refined data thus constitute a valid point of reference that helps underscore

the patterns of lexical innovation and adaptation observed in Arabic, especially with regard to the latest trends in gaming and AI technology. Frequency Distribution: Frequency refers to the occurrence frequency of certain terms. Apparently, it sheds light on how Arabic speakers deal with and adopt new vocabulary in response to the continuously changing technological context.

Table 1. Frequency Distribution of Terms in AI-driven Video Games

No.	Term	Freq.	No.	Term	Freq.	No.	Term	Freq.	No.	Term	Freq.
1	Glitch	57	**36**	Side quest	27	**71**	Fragment	19	**106**	Lobby	14
2	Respawn	51	**37**	Squad Wipe	27	**72**	menace	19	**107**	Rush	14
3	Spawn	51	**38**	Flanking	26	**73**	Ned	19	**108**	Scammed	14
4	Ping	50	**39**	Legend	26	**74**	Ban	18	**109**	Cracked	13
5	Zoning	49	**40**	Peek	25	**75**	Block	18	**110**	Hatrick	13
6	Nerf	46	**41**	Agility	24	**76**	Boost	18	**111**	Scammer	13
7	AFK	45	**42**	Close fight	24	**77**	Cap	18	**112**	Wipe	13
8	Mobs	44	**43**	Loot	24	**78**	on-site	18	**113**	PVP	12
9	revive	44	**44**	Pawned	24	**79**	pro	18	**114**	Diamond	11
10	Rage	43	**45**	Trade	24	**80**	Raid	18	**115**	Unbelievable	11
11	Lag	40	**46**	Clans	23	**81**	Restart	18	**116**	1 V 1	10
12	Noob	38	**47**	Cringe	23	**82**	Role	18	**117**	BRB	10
13	Aim	37	**48**	Mining	23	**83**	Beta	17	**118**	craft	10
14	Heal	37	**49**	NPC	23	**84**	Clutch	17	**119**	Unreal	10
15	Smoke	37	**50**	Quest	23	**85**	Drop	17	**120**	Carry	9
16	Items	36	**51**	FF	22	**86**	FPS	17	**121**	Cheesing	9
17	MVP	36	**52**	Troll	22	**87**	HP-Health point	17	**122**	Contract	9
18	Ace	34	**53**	Furnace	21	**88**	lane	17	**123**	Insane	9
19	Peak	34	**54**	Hacker	21	**89**	Scout	17	**124**	coal	8
20	Rank	33	**55**	Open	21	**90**	Aimbot	16	**125**	Dungeon	8
21	Aura	32	**56**	Overpowered- OP	21	**91**	Bot	16	**126**	Grinding	8
22	Damage	32	**57**	Biome	20	**92**	Potential	16	**127**	Store	8
23	Skin	32	**58**	Camper	20	**93**	Survival Mode	16	**128**	Format	7
24	Toxic	32	**59**	Easter Egg	20	**94**	Trap	16	**129**	iron	7
25	Buff	31	**60**	eliminated	20	**95**	Combo	15	**130**	Stack	7
26	Terminate	31	**61**	error	20	**96**	Fatality	15	**131**	Battle Pass	6
27	Leader	30	**62**	Quick scope	20	**97**	fence	15	**132**	INC	6
28	Rage quit	30	**63**	Server	20	**98**	Knocked	15	**133**	LOL	6
29	League	29	**64**	Shuffle	20	**99**	Nasty	15	**134**	One shot	6
30	Aggres-sive	28	**65**	WP - Well played	20	**100**	nice shot	15	**135**	Equip	5
31	Nock	28	**66**	Avatar	19	**101**	Adds	14	**136**	survive	5
32	XP-experi-ence point	28	**67**	Boss	19	**102**	Chill	14	**137**	Wallhack	5
33	Camp	27	**68**	Cheat	19	**103**	cover	14	**138**	Low	4
34	Game Mode	27	**69**	enemy	19	**104**	GG	14	**139**	Tarnab	4
35	Negative aura	27	**70**	finish	19	**105**	Headshot	14	**140**	Sniper	4
										Total=	**2,941**

Figure 1: Frequency Distribution of Terms in AI-driven Video Games

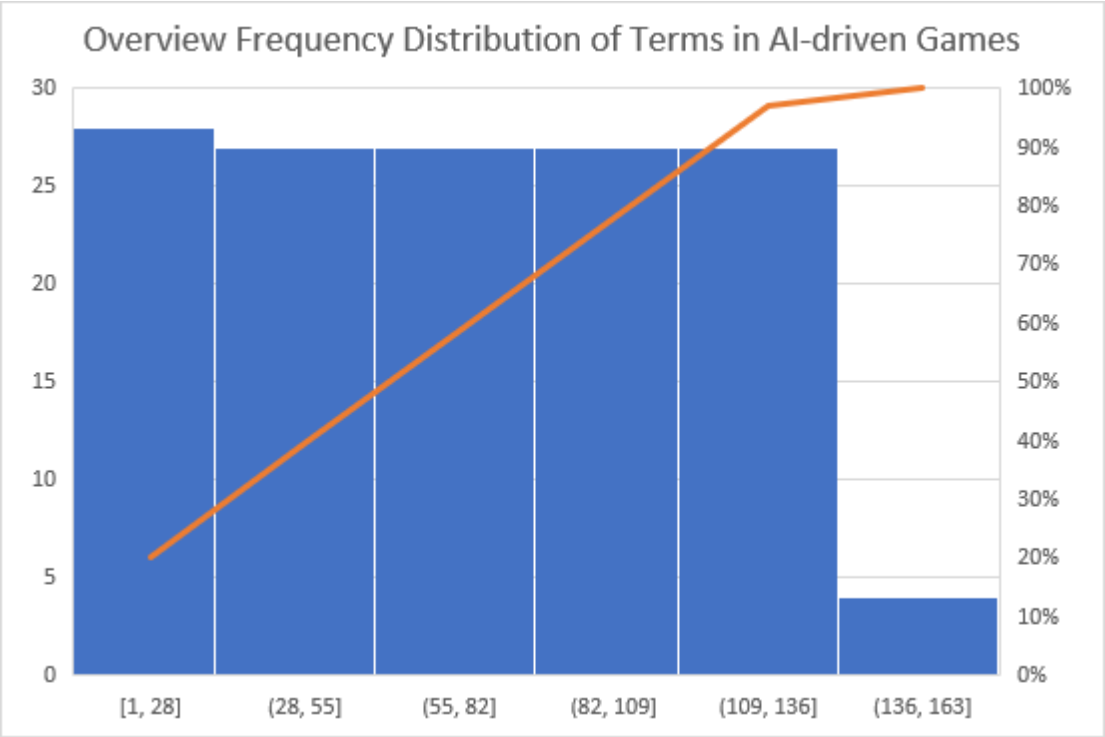

Figure 1 clearly illustrates the frequency distribution. The frequency analysis of terms related to gaming community offers a deeper look into the acceptance and usage of the terms within the Arabic gaming community: *glitch, respawn, spawn, ping, zoning, nerf, AFK, mobs, revive, rage, lag, and noob* were among those that had come out as the most used. This is evidence that they have been well integrated into the Arabic gaming vocabulary. With middle-range frequencies, such as *aura, nock, camp, flanking, furnace, FF, avatar, mining, buff, agility, loot, easter egg, and league*, usage is regular. It underlines the role of these words in playing games and communicating while gaming. The low-frequency ones included Stack, wallhack, bot, lane, clutch, frame, bets, potential, HP, fatality, combo, chill, adds, and GG. They would be used in more specialized or context-specific ways, or may simply reflect that Arabic alternatives are sought in certain situations. Notably, they have social and behavioral implications, drawing on the Arabic use of gaming culture in relation to human relationships and thus expanding further on how Arabic is used to express specific and complicated ideas.

The frequency distribution reveals validation and confirmation clear preference for loanwords, particularly for technical and gameplay-specific terminology, emphasizing the challenges of creating Arabic equivalents for rapidly evolving gaming concepts.

The list was then divided into two subcategories according to electronic social-emotional and technical dynamics, namely emotional and social contexts and technical and performance-based contexts, while acknowledging and stressing the boundaries' fuzziness. The two categories are closely linked through a relationship of entailment and inclusion. This implies that the items in the two lists are not entirely distinct, as they inherently overlap and influence each other. There is no- clear-cut separation between the items in the two lists, as they inherently depend on and include one another. Table 2 presents the AI-driven video game terms in emotional and social contexts. This category appeared to follow the sub-categories: 1.1 Emotional Expressions: 1.2 Player-AI Emotional Interactions: 1.3 Social Interaction.

Table 2: Emotional and social terms

#	**1. Emotional and Social Contexts**				
1.1	**Emotional Expressions**	18	camper	36	close fight
1	cheesing	19	glitch	37	fence
2	chill	20	hacker	38	furnace
3	clutch	21	negative aura	39	GG
4	cracked	22	nasty	40	legend
5	cringe	23	scammed	41	LOL

6	hatrick	24	scammer	42	low
7	insane	25	shuffle	43	menace
8	nice shot	26	squad wipe	44	ned
9	potential	27	survive	45	nock
10	pro	28	troll	46	on-site
11	rage	**1.3**	**Social Interaction**	47	open
12	rage quit	29	aura	48	peak
13	toxic	30	avatar	49	pawned
14	unbelievable	31	ban	50	coal
15	unreal	32	battle pass	51	iron
16	well played – WP	33	beta	52	finish
1.2	**Player-AI Emotional Interactions**	34	bot	53	error
17	camp	35	BRB	54	Inc

Table 2, which shows all 54 terms, comprises a good collection of terms used by Arab gamers, primarily terms related to emotional and social preferences categorized into three groups based on their context. The first group comprises emotional terms expressed to another online player, such as *insane, child, cringe, toxic, nice shot, unbelievable, unreal, well-played, cheesing, clutch, hatrick, etc.* The second group comprises player-AI emotional interactional terms such as *camp glitch, nasty, scammed, scammer, shuffle, squid wipe, etc.* The third group includes social interaction terms that do not carry emotions, such as *Aura, avatar, ban, battle pass, beta, bot, GG, error, pawned*, etc. Arab gamers use the 54 terms presented in Table 2, although most do not have Arabic equivalents. This is due to the inability of the Arabic equivalents, such as *cheesing, chill, clutch, close fight, coal, hatrick, GG, lane, LOL, low, menace, nasty, ned, aura, mobs, open, rage, scammer, squad wipe, shuffle, troll, toxic, unbelievable, WP, XP, etc.* in other words, it is the original English term and not its Arabic equivalent, if any, that was the right option for the gamers (sample members). This is due to the inaccessibility of the Arabic equivalents, such as *glitch, beta, cringe, etc., to replace* with the Arabic equivalent and even words like /had'di/, /majnu:n/, /qudra/, etc., which are usually common in daily interactions, were used, respectively, chill, insane, potential in the gaming community. Similarly, Table 3 presents the AI-driven video game terms in technical and performance-based Contexts 2.1 Debugging and Errors, 2.2 Resource Management, 2.3 Security and Integrity)

Table 3: Technical and performance-based

#	**2. Technical and Performance-based Contexts**				
2.1	**Debugging and Errors**	29	easter egg	59	raid
1	adds	30	eliminated	60	rank
2	AFK	31	enemy	61	respawn
3	FF	32	equip	62	revive
4	FPS	33	fatality	63	role
5	lag	34	flanking	64	rush
6	ping	35	game mode	65	scout
7	restart	36	grinding	66	side quest
8	server	37	headshot	67	skin
9	format	38	heal	68	smoke
2.2	**Resource Management**	39	HP-health point	69	spawn
10	ace	40	items	70	stack
11	aggressive	41	knocked	71	store
12	agility	42	lane	72	survival mode
13	aim	43	leader	73	tarnab
14	biome	44	league	74	trade
15	block	45	lobby	75	trap

16	boost	46	loot	76	wipe
17	boss	47	mining	77	XP- experience point
18	buff	48	mobs	78	zoning
19	cap	49	MVP	79	1 v 1
20	carry	50	nerf	80	cover
21	clans	51	noob	81	fragment
22	combo	52	NPC	**2.3**	**Security and Integrity**
23	contract	53	one shot	82	aimbot
24	craft	54	overpowered- OP	83	cheat
25	damage	55	peek	84	terminate
26	diamond	56	PVP	85	wallhack
27	drop	57	quest	86	sniper
28	dungeon	58	quick scope		

Table 3, which shows all 86 terms, also comprises a good collection of terms used by Arab gamers, primarily terms related to technical and performance-based categorized into three groups based on their context. The first group comprises debugging and errors, such as *adds, AFK, lag, ping, etc.* The second group comprises interactional terms for resource management, such as *ace, agility, buff, fatality, loot, etc*. The third group comprises security and integrity terms that ensure safety, reliability, and ethical use of systems, such as *aimbot, cheat, wallhack,* etc. Arab gamers use the 86 terms presented in Table 3, although most do not have Arabic equivalents. As shown earlier, Tables 2 and 3 are thematically similar as they represent AI gaming technology. Put differently, the two list terms are interdependent. In fact, there are no clear-cut distinctions between the terms in the two lists, as any of them could potentially belong to the other. Such a formal, rather than content-based, categorization may aim to highlight the recently AI-driven video game terms that have been integrated into the Arabic language system. The second research question explores the factors that drive gamers' adoption and integration of AI-driven gaming neologisms into everyday language. The participants provided the following reasons:

1. Enhanced communication efficiency:
AI-related terms often simplify complex gaming concepts, making it easier for players to quickly communicate in-game strategies and actions.

2. Trendiness or youth preferences:
Youth are drawn to new languages to keep up with trends. Using neologisms makes them feel connected to the latest gaming culture. Even when Arabic equivalents exist, youth may prefer neologisms for the perceived modernity, trendiness or alignment with the modern gaming culture.

3. In-group exclusivity:
Neologisms help gamers establish a sense of community and identity; using these terms can signal belonging to specific subcultures.

4. Innovation and creativity:
Lately, new gaming terms and AI have been the realms of innovation.

5. Influence of streamers and social media influencers, particularly gamers:
New terms emerge as players attempt to be creative and describe different AI behaviors or game techniques.

6. Expert sensing:
Using neologisms can make gamers feel that they have wider knowledge or are skilled in understanding AI techniques and are experts in their field. This adds to their social standing within the game community.

7. Escalating game difficulty: as AI technology improves, game techniques become more difficult. This requires

knowing new terms to describe actions and concepts that did not exist before.

8. Meme cultural implementation:

AI gaming slang is often subject to meme culture. This is where phrases catch on rapidly due to humor or ironic usage and spread through various online platforms.

9. Secrecy and privacy:

Using specific neologisms creates a sense of partition between youngsters and adults (gamers and non-gamers). This gives them a way to communicate that may be less understood by those outside their peer group. It also allows them to maintain a certain level of privacy in their conversations. Thus, avoiding potential supervision and interference.

10. Lack of equivalent Arabic terms:

Although Arabic is a rich language, it might not have widely recognized equivalents for certain AI-driven gaming terms. This leads to adopting or creating new terms. Youth borrow or adapt these terms instead of using the Arabic language, as many gaming terms originated in the English language, and do not have Arabic alternatives. The AI-emerging industry is rapidly evolving, and Arabic language adaptation may delay in introduction the new concepts.

This demonstrates that the gap in language resources can encourage the adoption of new terms to express new ideas and technologies better, particularly in the AI-driven industry. While many of these terms can be found in English dictionaries, they have gained widespread use among Arab gamers. To answer the third research question about the common changes in word structure and the processes that form new words in Arabic, the study shows that new words are greatly changed by how words are formed, like adding prefixes or suffixes, which has had a direct on new words. This also includes changes in grammar, like the types of words, their membership, and grammatical categories, like parts of speech. When foreign words are taken into Arabic, they tend to fit its word and sound systems. Arabic grammar is highly structured and complex. Words are usually formed from a root and a pattern. A root, often three consonants, carries the fundamental meaning and, with the additions of patterns or other changes in form, the meaning is modified. Also, Arabic uses vowel marks to show pronunciation and grammar. This helps to understand sentences, including Turkish, Spanish, and English, and it has given words like ‘sugar’ (from Arabic sukkar)

Arabic has also borrowed terms from other languages especially in more modern contexts to cover the terms used in the sciences and technologies (Ryding, 2005). Such a two-way transfer serves to highlight the dynamic nature of the Arabic language - that it is a source and at times a receiver in the process of human linguistic evolution. Because of the research about spoken Arabic, it is noted that the non-standard Arabic variety is not as rigid in derivations like morphophonemic and syntactic variations.

In establishing the relation between neologisms and the processes of word-formation, notice should be paid to the following aspects: first, the identification and analysis of a linguistic process that influences the formation of neologisms, focusing on how the processes operate; secondly, an exploration of underlying motives for the occurrence of such processes.

In describing the linguistic processes, one has to consider the most common morpho-phonemic, syntactic, and word formation mechanisms that allow neologisms to be incorporated into the Arabic language system. These processes and their linguistic characterization can be summarized as follows:

1. Loan words: This process involves selecting loanwords to serve as a system to which a native inflectional morpheme is attached. These terms, often borrowed directly from English, reflect the preservative influence of global gaming culture and the lack of a standardized Arabic equivalent (e.g., سكن → سكنك → سكانات (skin) /skin/ → /ski’ni/ → /ski’nat/). In the examples provided above, the three affixes that are added to the loanword used as a stem are: (1) the genitive case marker Arabic suffix -ak ‘you’ (send person) /ak/ and (2) the plural forming Arabic suffix -at /a:t/ as in the case of سكانات ‘skins’ /ski’nat/, بوت → بوتات (bots) /bɒta:t/. Also, the genitive case marker -i ‘my’ (first person) /i:/ as in the case of (e.g. فريم → فريمي (frame) /freɪm/ → /freɪmi/, ريفايف → رّيفني (revive) /rayivni/, تمّيل → هّيلني (heal) /

hayilni/, فريمي, بينج → بنجي (ping) /biŋi/.

2. Syntactic changes, which may be demonstrated in the following cases:
   - Where English verb forms have, as neologisms, been integrated and naturalized into the Arabic grammatical system, representing a case of adaptation (i.e., English words are pronounced according to the Arabic language system), e.g., buff → بفوها /bʌfu:hə/, camper → مكمبر /ʔimikambir/, hacker → بهكر /bihak'ir/, cracked → كرّكتو or مكرّك/kar'raktu/ or /ʔimikarrik/, damage → بدمّج or دمّجتو or اتدمّجت /bidam'idʒ/ or /dam'adʒtu/ or / ʔit'dam'adʒ'it/, drop → دربّتو /dərabtu/, terminated → ترّمن /tərman/, finish → فنّشتو /fanəʃ/, glitch → جَلّتَش or بتجَلّتِش /gəltiʃ/ or /bitgəltiʃ/, nock → نوّكتو /nawak'tu/, nerf → نرّفوها /nər'rafuha/, respawn → رَسبَن or بِرَسّبِن /birasbin/, cringe → بِكَرنِج /bikarnidʒ/ , flank → فلّنكتو /falnaktu/, zoning → زوّنت /zawan'nit/
   - Change in the grammatical category/ part of speech. This happens when some neologism is fully integrated into the Arabic language system. Therefore, a change in the part of speech applies. For example, the word 'glitch' is a noun (n) and is used as verb (v) to have an error in the game files → جَلّتَش /gəltiʃ/ or بتجَلّتِش or /bitgəltiʃ/; to aim (v) → إيمو /ʔaimu/ (n); ace adjective (adj) → بأيّيس /biʔayis/ (v); biome (n) → مبيّيم /ʔimbayim/ (adj); ban (v) → تبنّدت /tbanadat/ (adj); fence (n) → فنّس (v); furnace (n) → تفرّنس /ʔitfərnəs/ (adj); loot (n) → لوّت /lawət/ (v); smoke (v, n) → سمّكت /sam'akat/ (adj); noob (adj) → منوّب /ʔimnawib/, peek (n) → بِبيّك (v) /bibayik/; AFK (adj) → مأفّك /ʔimʔaffik/, sniper (n.) مسنبر /ʔimsanbir/.

3. Morph-syntactic changes, the 'passive participle: In some cases, neologisms, through a process of derivation, have changed their grammatical form. The passive participle is a derivation of verbs used to convey that an action has happened or is happening by someone else. For example, the verb '*aim*, *crack, damage, block* 'have taken the 'passive participle form as in: *aimed* → بأيّيم/biʔayim/; cracked → مكرّك /ʔimikarrik/, damaged → مدمّج /ʔimdamidʒ/, blocked → مبلّك /ʔimbal'ik/.
4. Phonetic changes: This occurs in the adaptation and integration process into the borrowing language's phonological system. These changes happen at various stages, influenced by the nature of the language contact, the borrowing community's characteristics, and the neologism's specific linguistic features. For example, since the Arabic sound system does not adopt a voiceless bilabial plosive /p/, neologisms with this sound /p/ are pronounced in the Arabic counterpart /b/. In this case, words like pass → /bæs/, cap → /kæb/, drop → /drɒb/, open → /aubən/, peak → /bi:k/, peek → /bi:k/, potential → /pəˈtenʃəl/, pro → /bro/, ping → /biŋ/, wipe → /waɪb/, etc. it is worth noting that all gamers in spoken Arabic do not consistently adopt phonetic changes. This process aligns with Farah and Halahleh (2020: 204), who explored the concept of native language interference. They highlighted that the differences between the Arabic and English phonetic systems present challenges for English learners at Hebron University. They noted that one key difficulty is pronouncing sounds absent from the Arabic phonological inventory, such as /p/, /tʃ/, /ʒ/, and /v/.
5. Abbreviations: Many abbreviations evolve into widely recognized neologisms as they become commonly used in spoken and written languages. Since this study focuses on the spoken language, many neologisms have been integrated into Arabic as abbreviations. This applies to terms such as ون في ون /wʌn vi wʌn/ one v one (fighting with weapons); اي اف كي /eɪ ef ˈkeɪ/ AFK (Away from Keyboard); جود جيم /gudgeim/ GG (Good Game); اف بي اس /freɪm pɜːr ˈsekənd/ FPS (Frame per Second); أو بي /əʊvərˈpaʊərd/ OP (overpowered); إن بي سي /ʔenpi:si:/ NPC (Non-player character), دبليو بي /dʌblju: ˈpi/ WP (Well-Played);اكس بي /ʔeks ˈpi:/ XP (Experience Points);ايتش بي /ʔitʃ ˈpi:/HP (Heal Point).
6. Reduplication: This process occurs when a free morpheme is repeated to form a new word. Many reduplications evolve into recognized neologisms as they become commonly used. Many replications have been integrated into Arabic, such as lag → مَلَجلِج /ʔimlaglig/. This example demonstrated the ablaut reduplication process, which is partial reduplication with changes in the vowel part of the morpheme.
7. Definiteness: This occurs when in words borrowed into Arabic, while adapting the English language form, gamers integrate the Arabic definiteness marker instandard Arabic ال 'ʔal' into the linguistic system and its colloquial counterparts ال 'ʔil' which is equivalent to English 'the' such as aura → الأورا /ʔilɔ:rə/

(the aura), boss → البوس /ʔilbus/ (the boss), pass → الباس /ʔilpa:s/ or /ʔilba:s/ (the pass), clan → الكلان /ʔilikla:n/ (The clan), easter egg → الإيستر إج /ʔil i:stər ʔəg/ (the easter egg), fatality → الفاتيليتي /ʔilfə'tilıti/ (the fatality), game mode → الجيم مود /ʔilgeım məʊd/ (the game mode), items → الأيتمز /ʔilʔaıtəmz/ (the items), leader → اللیدر /ʔilli:dər/ (the leader), league → الليج /ʔill:g/, lobby → اللوبي /ʔillu:bi/, mobs → الموبز /ʔilmubs/ (the mobs), server mode → السيرفر مود /ʔilsevər məʊd/ (the server mode), side quest → السايد كويست /ʔilsaıd kwist/ (the side quest), zone → الزون /ʔilzoʊn/ (the zone). This process influences how neologism is incorporated into the Arabic language.

Neologisms have fully integrated into and adapted to the Arabic language grammatical system to take fully-fledged verb form as in the frequently use verb by gamers: بفوها /bʌfu:hə/, hacker → بهكر /bhakti/, damage → بدمّج or دمّجتو /bidam'idʒ/ or /dam'adʒtu/ or / ʔit'dam'adʒ'it, glitch → جَلّتش /gəltiʃ/ or بتجَلّتش or /bitgəltiʃ/.glitch → جَلّتش or بتجَلّتش /gəltiʃ/ or /bitgəltiʃ/, nock → نوّكتو /nawak'tu/, respawn → رَسبَن or بِرَسّبن /birasbin/.

The correlation between the linguistic features of neologisms and their chances of survival and existence within the language must be established to understand the underlying reasons for these linguistic processes. This correlation explains which factors might inform the acceptance and endurance of newly coined terms. Those neologisms that successfully adapt to morphological, phonological, and syntactic systems of the Arabic language are more likely to survive and form a permanent part of its lexis. This is particularly the case for terms related to scientific developments and technological progress since they require fast and precise communication. The rate of spreading specific concepts across the world is usually accelerated by using indigenous terms created for certain products or ideas. It goes without saying that currently popular terms tend to spread all over the world in their original language in which they first appeared. Even when native language equivalents have been suggested, those borrowed terms tend to be used more often because of their wide recognition, ease of use, and communicational efficiency.

They highlight the mutually interacting factors of tradition and innovation in Arabic linguistics. Whereas language academicians have the important task of standardizing terms, the online version of these AI games allows the decimation and experimentation of the use of Arabic at levels never before attained. We have borrowed loanwords from younger speakers, derivatives showing the versatility of Arabic morphological rules. Transformations are accompanied by some questions concerning cultural identity and historical Arabic roots. The research shows that Arab gamers have adopted several English gaming terms with specialized meanings. Although most of these words exist in English dictionaries, they have become popular among the Arab gaming community and have acquired unique meanings. For example, the terms Compare are known only within game contexts, which is useful because young learners build polysemy of these words indirectly while they grow. Furthermore, based on the observation of the researcher, findings indicate that children from 9 to 12, the Generation Alpha, are fluent with this gaming language and might be already considered experts in using this language.

The Generation Alpha, or Gen Alpha, as explained by McCrindle (2006), are the cohort born into the increasingly digital and connected world. Notwithstanding his endorsement, the claim of Prensky (2001) concerning early and continued exposure to such advanced technologies holds that Gen Alpha is developing a fundamentally different relationship with their digital environments. Such relationships will influence not only learning styles but also language development, particularly in adopting and adapting AI neologisms. This trend shows the urgency for study on language change due to these technological innovations, most especially when it comes to AI- and tech-driven ones.

6. Conclusion

The integration of AI gaming neologisms in Arabic testifies to the flexibility of this language. Arabic manages to overcome the difficulties of the digital age by realizing a balance between traditional linguistic strategies and modern ones. However, this process also underlines that it is necessary to find a balance that would respect cultural heritage while pressing toward innovation.

This paper has well established that the emergence of AI gaming platforms has impacted the Arabic language. From this study, the role of AI-gaming new terms in communication and interaction was realised

in all fields. The findings reveal that even when Arabic equivalents are created through coinage, derivation, hybridization or loan translation processes, the original English terms are often dominant. For example, neologisms in internationalized contexts.

Generation Z, born between 1997 and 2012, as defined by the Pew Research Center in 2024, and Gen Alpha are drivers of this transformation. Generation Z has been very instrumental in adopting and popularizing social media-driven neologisms. Even more heavily influenced by digital platforms and AI-driven technologies, Gen Alpha blends English and Arabic. Gen Alpha may grow up with a hybrid linguistic identity where traditional Arabic patterns coexist with, or even are reduced. This raises important issues for the future of Arabic concerning language preservation and identity facing a digitalized world. The finding suggests that Arabic language teachers must constantly self-educate to remain relevant to advancing language trends. This emphasizes that focused professional development programs should be available so teachers can effectively cope with and employ developing language phenomena in their work (Al-Momani, and Maqableh, N, 2024).

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Appendix

A List of AI-Driven Video Games of Single-Player and Multiple Player Games

Participants answered the list of AI-driven video games, including single-player and multiple-player games. The type, AI features and description are as mentioned in (*AI In Video Games | Columbia University*, 2022b)

Single-Player Games			
No.	**Game Title**	**Type**	**AI Features and Description**
1	The Last of Us Part II	Action-Adventure	Uses AI for realistic enemy behavior and companion NPCs.
2	Alien: Isolation	Survival Horror	Features an adaptive AI-driven alien that learns player strategies.
3	Red Dead Redemption 2	Open World	AI governs NPC routines, interactions, and responses to player actions.
4	Horizon Zero Dawn	Action RPG	AI controls robotic creatures with complex behaviors and interactions.
5	Shadow of Mordor/War	Action RPG	The 'Nemesis System' allows AI enemies to remember past encounters and adapt.
6	Cyberpunk 2077	Open World RPG	AI-driven NPC behaviors, enemy tactics, and dynamic crowd reactions.
7	XCOM 2	Strategy	AI-driven enemy strategies adapt to player movements.
8	Hitman (Series)	Stealth	AI-driven NPC routines and response systems create dynamic gameplay.
9	Resident Evil Village	Survival Horror	Adaptive AI adjusts enemy aggression based on player performance.
10	Detroit: Become Human	Interactive Story	AI-driven decision-making affects story progression and interactions.
11	F.E.A.R. (Series)	First-Person Shooter	Advanced enemy AI tactics include flanking, cover use, and coordination.
12	Dark Souls (Series)	Action RPG	AI-driven enemy behaviors react to player movement and strategies.
13	The Elder Scrolls V: Skyrim	Open World RPG	AI-driven NPC routines and emergent AI-driven questlines.
14	Bioshock Infinite	First-Person Shooter	AI-powered companion (Elizabeth) assists dynamically in gameplay.
15	Frostpunk	City Builder	AI-driven city-building mechanics and dynamic survival challenges.
16	RimWorld	Simulation	AI storyteller dynamically adjusts game difficulty and world events.
17	Half-Life: Alyx	VR FPS	Advanced AI for enemy interactions, especially the Combine and Head crabs.
18	The Witcher 3: Wild Hunt	Open World RPG	AI-driven monster behaviors, NPC reactions, and enemy tactics.
19	Metal Gear Solid V: The Phantom Pain	Stealth	AI-driven enemy soldiers adapt to player tactics over time.
20	Dead Space Remake	Survival Horror	AI adapts enemy spawn rates based on player behavior.
Multiplayer Games			
No.	**Game Title**	**Type**	**AI Features and Description**

1	Dota 2 (AI Bots)	MOBA	Uses OpenAI's 'Five' to play at competitive levels.
2	Valorant	First-Person Shooter	AI-driven enemy behavior in bot modes and anti-cheat detection.
3	Apex Legends	Battle Royale	AI powers matchmaking, skill-based ranking, and in-game bots.
4	Call of Duty: Warzone	Battle Royale	AI-driven bots in training modes and enemy AI in missions.
5	Fortnite	Battle Royale	AI-driven matchmaking, NPC enemies, and bots in lower-ranked matches.
6	Rainbow Six Siege	Tactical Shooter	AI controls bots in training modes and assists in cheat detection.
7	Left 4 Dead 2	Co-op Shooter	The 'AI Director' dynamically adjusts enemy spawns and difficulty.
8	Battlefield 2042	First-Person Shooter	AI-driven bots populate matches and adapt to player strategies.
9	Destiny 2	Online FPS RPG	AI governs enemy NPCs, mission generation, and raid mechanics.
10	Escape from Tarkov	Survival Shooter	AI-driven scavenger enemies (Scavs) learn from player behavior.
11	Overwatch 2	Hero Shooter	AI bots for practice modes and AI-assisted match balancing.
12	World of Warcraft	MMORPG	AI-driven NPC behaviors, quest interactions, and PvE enemy logic.
13	GTA Online	Open World Multiplayer	AI governs NPC interactions, heist strategies, and random events.
14	EVE Online	MMO Space Sim	AI-driven NPC factions, economy, and enemy AI responses.
15	Deep Rock Galactic	Co-op FPS	AI-driven enemy swarms react to player actions and environment.
16	Halo Infinite	First-Person Shooter	AI-powered bots for training and AI-assisted enemy tactics.
17	Minecraft	Sandbox	AI-driven enemy behaviors, pathfinding, and procedural world generation.
18	No Man's Sky	Exploration Survival	AI governs procedural planet generation, wildlife, and NPC behavior.
19	Sea of Thieves	Multiplayer Adventure	AI-driven enemy pirate ships and NPC interactions.
20	Phasmophobia	Co-op Horror	AI-driven ghosts with unique behaviors and learning patterns.
21	PUBG: Battlegrounds	Battle Royale	AI-driven bots populate matches and provide training opportunities.
22	Hunt: Showdown	PvPvE Shooter	AI-driven NPC enemies and dynamic PvPvE elements.
23	Mordhau	Medieval Combat	AI-driven bots simulate real player combat behaviors.