

LEXICAL-SEMANTIC AND STRUCTURAL CHARACTERISTICS OF ARTIFICIAL INTELLIGENCE TERMS IN ENGLISH AND UZBEK LANGUAGES**Shokirjonova Bibinurbegim Ruslonbek kizi**

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bibinurruslanovna07@gmail.com**Abstract:**

The rapid development of artificial intelligence (AI) technologies has led to the emergence of a vast number of new terms and concepts in modern languages. As English serves as the dominant language of technological innovation, most AI-related terminology originates in English and is subsequently adopted, translated, or adapted into other languages, including Uzbek. This article examines the lexical-semantic and structural characteristics of artificial intelligence terms in English and Uzbek. The study focuses on the semantic classification, word-formation mechanisms, borrowing processes, and structural patterns of AI terminology in both languages. Through a comparative linguistic analysis, the research identifies similarities and differences in the formation and functioning of AI terms and highlights the influence of globalization and digital communication on terminological development. The findings demonstrate that while English AI terminology is characterized by a high degree of abbreviation, compounding, and derivation, Uzbek terminology often relies on transliteration, calquing, and semantic adaptation. The study contributes to the growing field of computational linguistics and terminology studies by providing insights into the linguistic representation of technological innovations across languages.

Keywords:

artificial intelligence, terminology, lexical semantics, structural analysis, English language, Uzbek language, term formation, computational linguistics, semantic adaptation, linguistic borrowing.

INTRODUCTION

The twenty-first century has witnessed unprecedented advancements in artificial intelligence, transforming various aspects of human life, including education, healthcare, transportation, industry, and communication. As AI technologies continue to evolve, they generate a vast body of specialized terminology that facilitates scientific communication and knowledge dissemination. The study of terminology has become an essential branch of modern linguistics because terms serve as linguistic units that represent scientific and technological concepts. Artificial intelligence terminology occupies a special place within contemporary linguistic research due to its dynamic nature and rapid expansion. Most AI-related concepts originate in English-speaking scientific communities and are subsequently introduced into other languages through translation, adaptation, or direct borrowing. Consequently, the investigation of AI terminology provides valuable insights into linguistic innovation, semantic change, and cross-cultural communication.

In Uzbekistan, the growing integration of digital technologies and artificial intelligence into educational and professional environments has increased the demand for standardized AI terminology in the Uzbek language. However, the rapid influx of English-based technological vocabulary often leads to inconsistencies in translation and usage. Therefore, a comparative study of English and Uzbek AI terms is both linguistically and practically significant. This article aims to analyze the lexical-

semantic and structural features of artificial intelligence terminology in English and Uzbek. The objectives of the study include identifying the semantic categories of AI terms, examining their word-formation patterns, and exploring the mechanisms through which English AI terminology is incorporated into Uzbek linguistic practice.

MAIN BODY

The development of artificial intelligence has significantly influenced the lexical systems of many languages by introducing new concepts, terms, and communicative practices. As one of the most rapidly evolving scientific and technological fields, artificial intelligence has generated a large and dynamic terminological system that reflects contemporary advances in computer science, linguistics, mathematics, and cognitive studies. Since the majority of innovations in this sphere originate in English-speaking scientific communities, English has become the primary source of AI terminology. Consequently, many languages, including Uzbek, have incorporated AI-related lexical units through borrowing, transliteration, semantic adaptation, and translation. From a lexical-semantic perspective, artificial intelligence terminology demonstrates a high degree of conceptual specificity. Unlike common vocabulary, scientific terms are expected to possess semantic precision and unambiguity within a particular field of knowledge. AI terms generally denote technological processes, computational models, algorithms, systems, and data-processing mechanisms. Examples such as artificial intelligence, machine learning, deep learning, natural language processing, computer vision, neural network, and large language model represent highly specialized concepts that are widely recognized within the scientific community. These terms function as linguistic representations of complex technological phenomena and therefore require clear semantic boundaries.

One of the most notable semantic features of AI terminology is the frequent use of metaphorical transfer. Numerous terms employed in artificial intelligence originate from concepts associated with human cognition and biological processes. Words such as learning, memory, attention, neural, reasoning, and intelligence traditionally describe human mental abilities but have been metaphorically extended to computational systems. For instance, the term neural network is based on the structure of biological neurons in the human brain, while machine learning metaphorically attributes the human capacity for learning to computer systems capable of identifying patterns within data. Such metaphorical extensions facilitate the conceptualization of complex technological processes by relating them to familiar human experiences.

The lexical-semantic structure of AI terminology in English is characterized by a high level of productivity and continuous expansion. Technological innovations regularly generate new concepts that require linguistic nomination. As a result, new terms emerge rapidly and become integrated into professional discourse. Terms such as prompt engineering, hallucination, fine-tuning, tokenization, multimodal model, and generative AI have become widely used only within the last few years due to the rapid advancement of large language models and generative technologies. This dynamic nature of AI terminology reflects the close relationship between scientific development and linguistic innovation. The Uzbek language has experienced similar terminological growth as artificial intelligence technologies become increasingly relevant in education, research, business, and public administration. However, the integration of AI terminology into Uzbek often follows different linguistic mechanisms. Many terms enter the language through direct borrowing from English. Examples include chatbot, prompt, token, transformer, and dataset. In such cases, the original form of the term is largely preserved because no widely accepted Uzbek equivalent has yet emerged. Direct borrowing allows for efficient communication among specialists but may also create challenges for broader public understanding. Another important mechanism in Uzbek AI terminology is transliteration. Through this process, English terms are adapted according to the phonological and orthographic norms of Uzbek.

Examples include algorithm from algorithm, robototexnika from robotics, and avtomatlashtirish from automation. Transliteration facilitates the integration of foreign lexical items while ensuring compatibility with the linguistic system of Uzbek. At the same time, it preserves the international character of scientific terminology and enables communication within the global scientific community.

Semantic calquing represents another productive strategy in the formation of Uzbek AI terminology. This process involves translating the semantic components of an English term into Uzbek while preserving its conceptual structure. For example, artificial intelligence has been translated as sun'iy intellekt, machine learning as mashinaviy o'qitish, deep learning as chuqur o'qitish, and speech recognition as nutqni tanish. Such translations contribute to the development of national scientific terminology and enhance accessibility for Uzbek-speaking users. Moreover, calqued terms often facilitate the dissemination of technological knowledge among individuals who may not possess advanced English-language competence. A comparative examination of English and Uzbek AI terminology reveals several structural differences. English terminology frequently relies on compounding and abbreviation, resulting in concise lexical units. Expressions such as chatbot, dataset, workflow, and benchmark illustrate the productivity of compounding in English. Similarly, abbreviations such as AI, NLP, LLM, CNN, and GAN are extensively used in scientific communication because they promote linguistic economy and efficiency. The widespread use of acronyms is a distinctive feature of English technological discourse and reflects the tendency toward brevity in professional communication.

In contrast, Uzbek terminology often employs descriptive multiword constructions to convey equivalent meanings. While English terminology tends to compress information into compact lexical units, Uzbek frequently expands the same concepts into more explanatory expressions. For example, natural language processing is translated as tabiiy tilni qayta ishlash, while computer vision becomes kompyuter ko'rishi. Such descriptive structures contribute to semantic transparency and facilitate comprehension among native speakers. Nevertheless, they may also reduce terminological economy compared with English equivalents. Another characteristic feature of AI terminology is the coexistence of multiple variants for the same concept. Because the field is relatively new, terminological standardization remains incomplete in many languages. In Uzbek discourse, different translations of the same English term may appear simultaneously. The concept of machine learning, for instance, can be found as mashinaviy o'qitish, mashina o'rganishi, or mashina ta'limi. Similarly, artificial intelligence may occasionally appear as sun'iy aql alongside the more widely accepted form sun'iy intellekt. Such variation reflects the ongoing search for optimal linguistic equivalents and demonstrates the dynamic nature of terminology formation.

The influence of globalization and digital communication has further accelerated the internationalization of AI terminology. Scientific publications, online platforms, conferences, and educational resources contribute to the rapid dissemination of English-based technological vocabulary across linguistic boundaries. Consequently, many AI terms function as internationalisms and exhibit similar semantic content regardless of language. However, cultural, linguistic, and educational factors continue to shape the ways in which these terms are adapted and interpreted within specific linguistic communities. The lexical-semantic and structural analysis of artificial intelligence terminology demonstrates that language plays a crucial role in the dissemination of scientific knowledge. Terminological systems not only reflect technological progress but also influence the accessibility and understanding of new concepts. The growing importance of artificial intelligence in contemporary society necessitates the development of consistent, standardized, and linguistically appropriate terminology in both English and Uzbek. Such efforts will contribute to more effective scientific

communication, educational practice, and intercultural exchange in the rapidly expanding field of artificial intelligence.

CONCLUSION

The comparative analysis of artificial intelligence terminology in English and Uzbek demonstrates that AI discourse represents a rapidly evolving linguistic domain shaped by technological innovation and global scientific communication. The lexical-semantic structure of AI terminology is characterized by specialization, metaphorical extension, semantic precision, and conceptual interconnectedness. English AI terminology primarily develops through compounding, derivation, abbreviation, and acronym formation, resulting in concise and efficient terminological units. Uzbek AI terminology, by contrast, relies heavily on borrowing, transliteration, semantic adaptation, and calque translation. These mechanisms facilitate the integration of international scientific concepts into the Uzbek linguistic system while preserving national linguistic identity.

The study reveals that despite structural differences, English and Uzbek AI terminologies share common conceptual foundations. The increasing influence of artificial intelligence on modern society necessitates the continued development and standardization of AI terminology in Uzbek. Future research may focus on corpus-based analyses, terminological standardization strategies, and the role of artificial intelligence terminology in specialized translation and language planning.

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