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Zoologlyphics: A Novel Script Inspired by Animal Forms and Structures

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ABSTRACT
Zoologlyphics is a newly developed writing system whose letterforms are derived from the shapes and structures studied in animal science. The script contains 26 characters, called "Zoophalets" (zoology alphabets) that correspond to the English A-to-Z set. Each character is modeled on distinctive morphological, anatomical, or osteological features drawn from both invertebrate and vertebrate phyla. The glyphs were intentionally designed to be easy to write and to serve as visual mnemonics, helping students recall key zoological concepts. The primary goal of Zoologlyphics is to make learning zoology more intuitive and engaging. A secondary benefit is its potential use as a covert communication system, given that the script is unfamiliar to the general public. Moreover, research indicates that mastering new writing systems can stimulate cognitive processes and influence neural networks involved in reading and memory. When implemented as a digital font, the system is called "Penguinka." It can be installed on any computer via the online font-creation platform Calligraphr (https://www.calligraphr.com). To our knowledge, this is the first customized script developed specifically for the field of zoology.

KEYWORDS: Zoologlyphics, zoophalets, script penguinka, cognitive thinking, secret communication system

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INTRODUCTION

Language scripts have been introduced in to human civilization from days of Mesopotamia for communication, to store knowledge and also to think as suggested by authors like Schmandt-Besserat, D. (1996). Olson, D. R. (1994) Daniels, P. T., & Bright, W. (Eds.). (1996). Apart from this, authors such Bermúdez (2003; 2005); Andrews (2012; 2020); Spaulding 2018), have all suggested that scripts are known to contribute to social cognition in away aid in social engagement. The earliest forms or scripts of language forms were either, *pictographic, (picture or drawings) logographic (word or morphemes)* or *ideographic (ideas or abstract concepts)* meaning, based on pictures, words or based on ideas. These scripts, may serve the function of communication, but have their own pit falls, such as there will be too many characters, to be memorized, difficult to develop a key word, for so many words. In this context English language, and its script which is

uses alphabets, is comparatively less complicated as it has limited number of symbols which can be easily memorised (Rhea Paul *et.al*, 2018). Apart from these written language scripts, a new way of communication which was prevalent during the World War II was known was Morse code, developed or invented by Samuel F.B. Morse in 1832. This form of communication involved dots and dashes and was used to send secret messages in Military. It helped the solders to send messages clandestinely during World War II and also during Vietnam War. (https://www.military.com/history/morse-code). Similarly, Braillie, a universally adopted writing system for visually impaired was created by Louis Braille in 1824. The code comprises of 63 distinct characters formed by raised dots that are embossed on paper and readers interpret the text by running their fingertips over these tactile patterns. ((https://www.britannica.com/topic/Braille-writing-system). These historical examples show that writing systems are often adapted or newly invented, to meet specific needs. Inspired by these scripts, it was decided to design a zoology-based script whose letterforms draw on animal shapes and biological concepts and hence described as zoologlyphics. This invention or creation may serve more than one purpose. Firstly it may serve as a Discipline-specific learning aid, as the script's animal-derived glyphs act as visual mnemonics, helping zoology students recognize and recall key concepts or terms and ideas. Secondly it may also be used as a secret communication tool, as it is unfamiliar to the general public, the script can double as a discreet code for private communication. Finally this script may contribute greatly to Cognitive enrichment. The variety of novel shapes, orientations, and stroke patterns may stimulate visual processing and memory, potentially strengthening reading skills and other cognitive functions. To my knowledge, this is the first writing system created exclusively for the zoological sciences, and I present it here as a proof-of-concept for discipline-tailored scripts.

MATERIAL AND METHOD

To develop the characters of this script, an extensive study was conducted across a wide range of animal forms, encompassing both internal and external structures. Morphological and anatomical features were closely observed and analyzed across various phyla of the animal kingdom. The script was intentionally designed to be simple and practical for writing. Elements from diverse biological systems including cell structures, organelles, and vertebrate osteology were incorporated into the formation of each character. After thorough comparative analysis and design iterations, a full set of characters corresponding to the English alphabets i.e. 26 characters, were conceptualized and illustrated based on these biological inspirations. Hand written alphabets have been created using regular ink el pen on a single ruled sheet for easy understanding and visualization.

RESULTS

As mentioned earlier, all the characters are based upon structures from animal kingdom. Details are given below. (**Fig-1, 2, 3 & 4)**. Alphabet **A** has been inspired by Radula of Pila, which is strap of tissue, with teeth placed over it. Similarly **B**= has been inspired by the shell of snail which is spiral design, **C**= Chromosome inspired. **D**= Mitochondria, E= this letter has been inspired by ganglia of invertebrates. **F**= has been inspired by tail fin of fish, **G** = Bowman's capsule of kidney. Likewise, **H**= this letter resembles phospholipid bilayer, **I**= Spicule of sponges, **J**= Resembles a flagellum originating from basal granule. Alphabet **K** resembles the crest of peacock. In the same way **L**= beak of a bird. **M** = crest of peacock**, N**= equivalent to cilia / byssus thread. Similar to these letter, **O** = statocyst of prawn, P = once again inspired by crest of peacock. Alphabet Q= has been inspired by kidney of vertebrate**, R**= inspired by curved horns. Likewise if the alphabet **S**= has been inspired by spermatheca of earthworm and also tube feet of starfish. The shape has been slightly twisted so that it can be written easily. Alphabet **T** has been inspired by a bony structure found in vertebrates called interclavicle. It is naturally in this shape and so can be easily drawn or written. Correspondingly other alphabets such as **U** = has been designed inspired by the structure of ribosome. During protein synthesis, smaller and larger subunits of ribosomes come together, hence this rounded shape has been designed. Alphabet **V** has been designed taking inspiration from the horns/

antlers of deer. Alphabet **W** has been designed taking inspiration from Whelk egg cases of snails. They are often found as twisted disc like coils. Likewise, **X** has been designed inspired by anatomical structure found in brain called the optic chiasma. Alphabet **Y** is designed inspired as nose with nostrils of vertebrates. Finally the alphabet **Z** has been designed, inspired by a structure found in vertebrate eye called as zonule of zinn. All the alphabets in the script are inspired by the morphological and anatomical structures of animals. To enhance aesthetics and improve writing convenience, elements such as the peacock's crest and L-shaped tubular forms have also been incorporated. These features make the script both distinctive and easy to write and recognize.

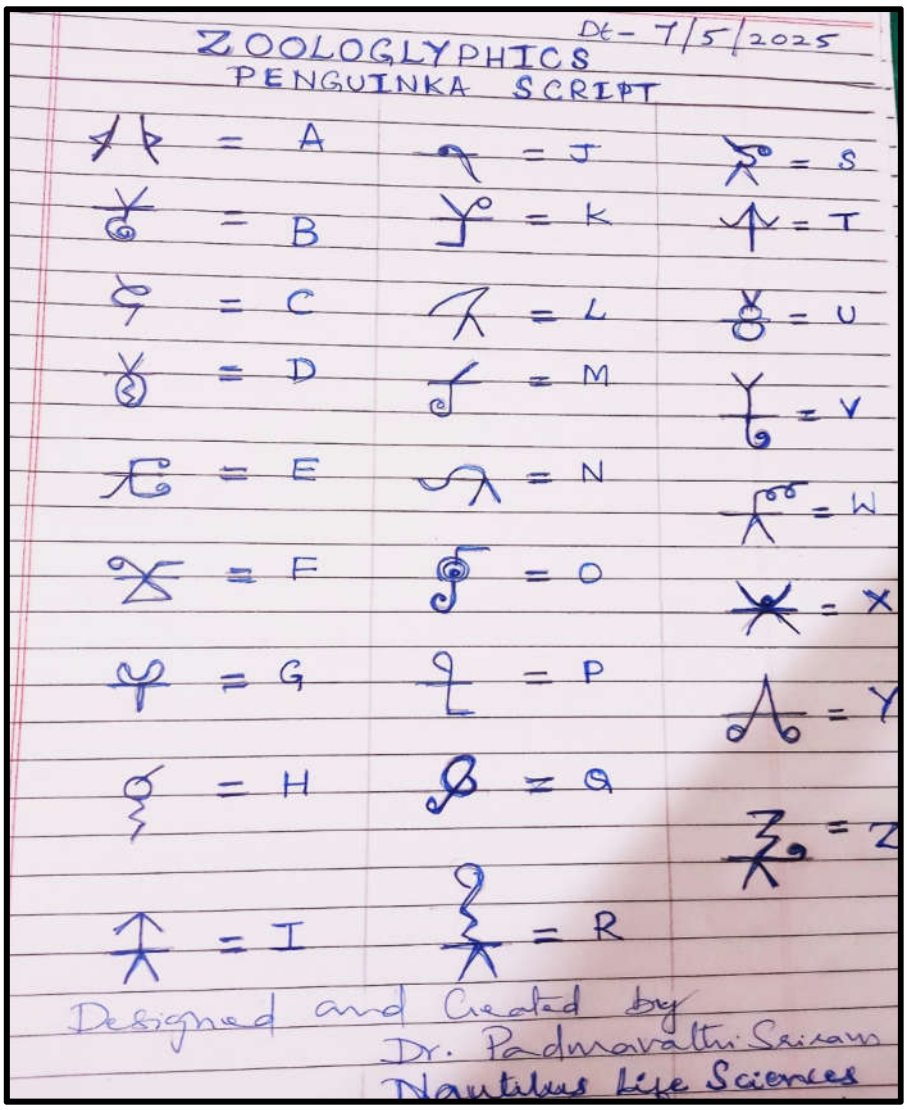

Figure 1:

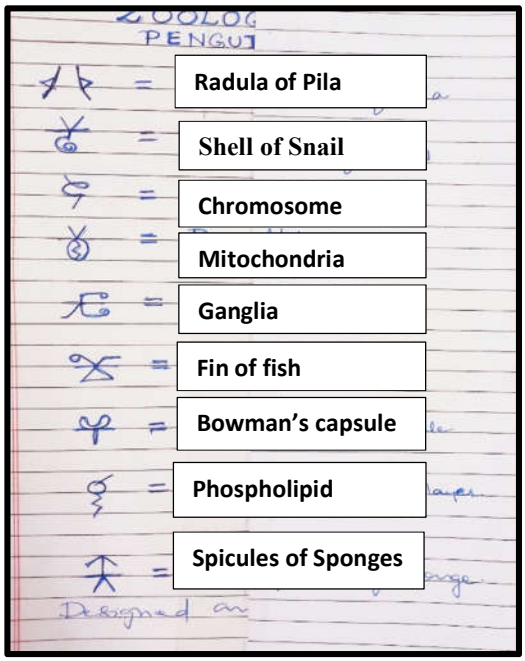

Figure 2:

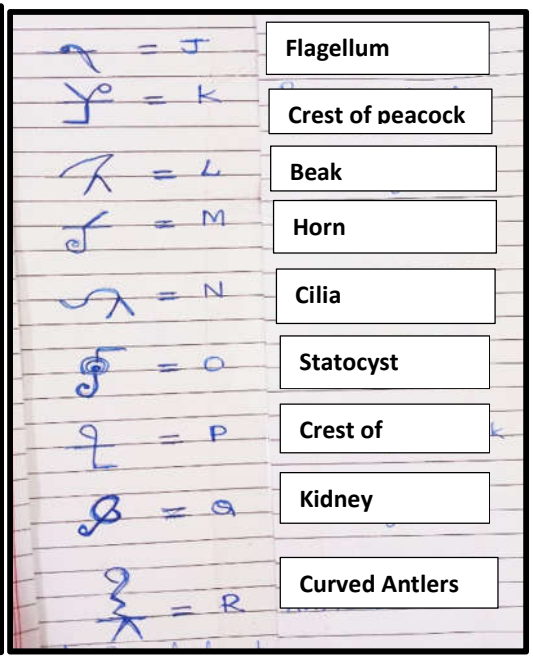

Figure 3:

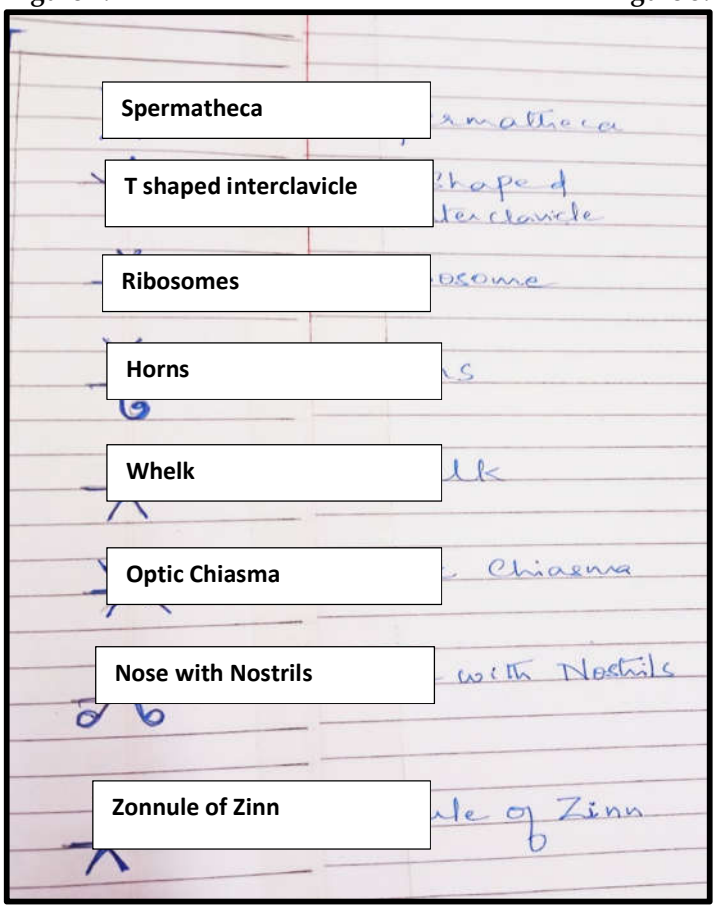

Figure 4:

ABSTRACT written USING THE PENGUINKA SCRIPT

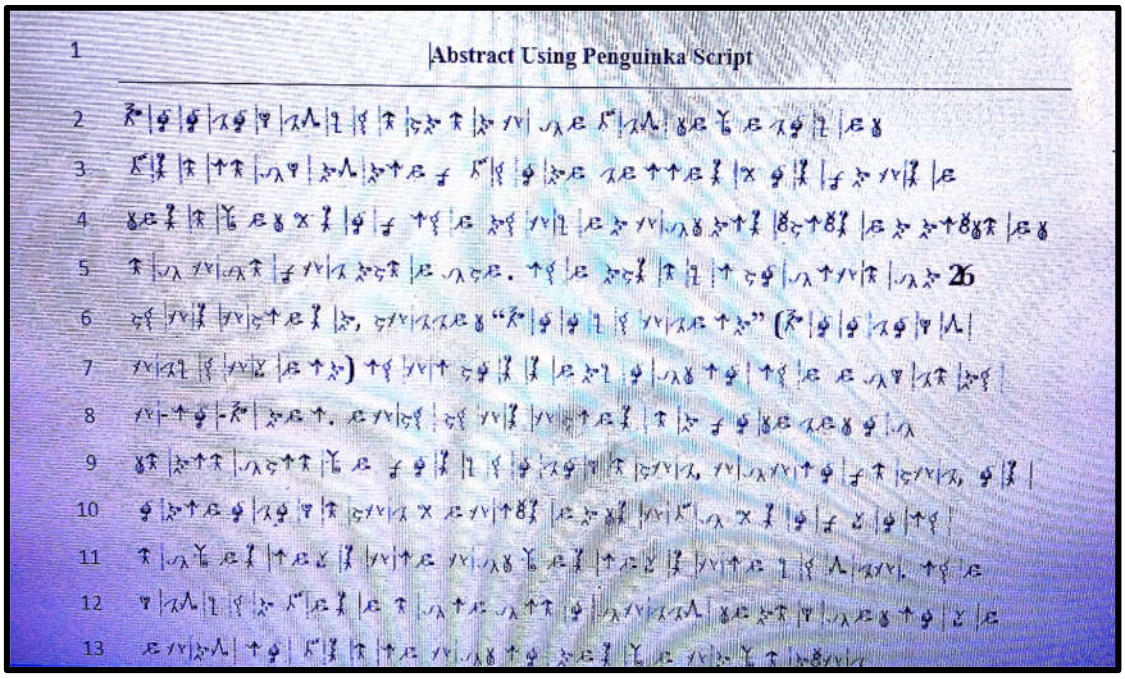

Figure 5:

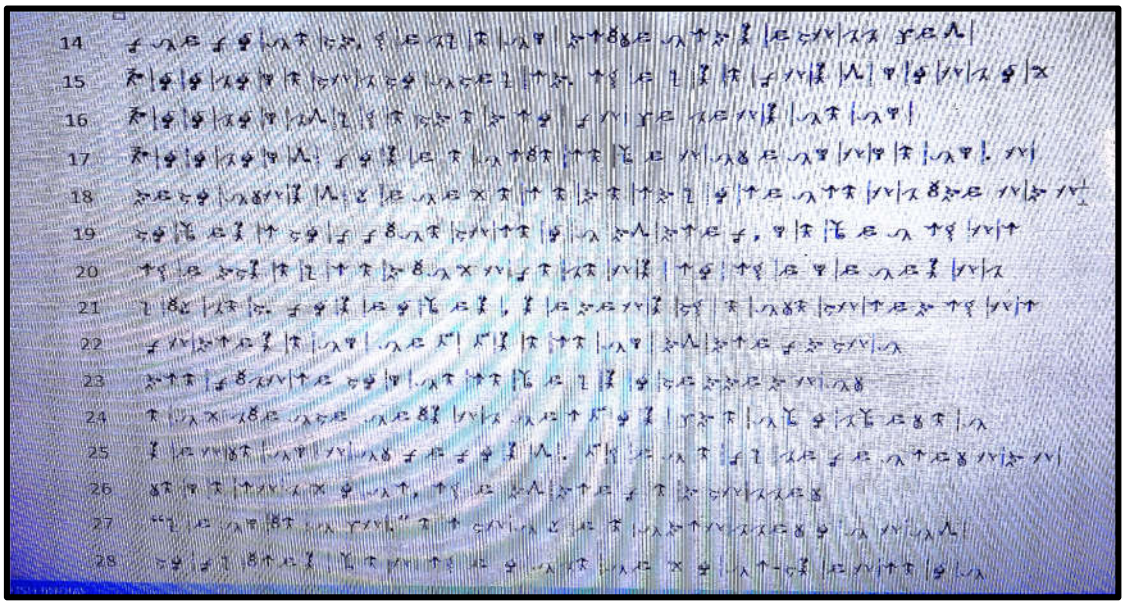

Figure 6:

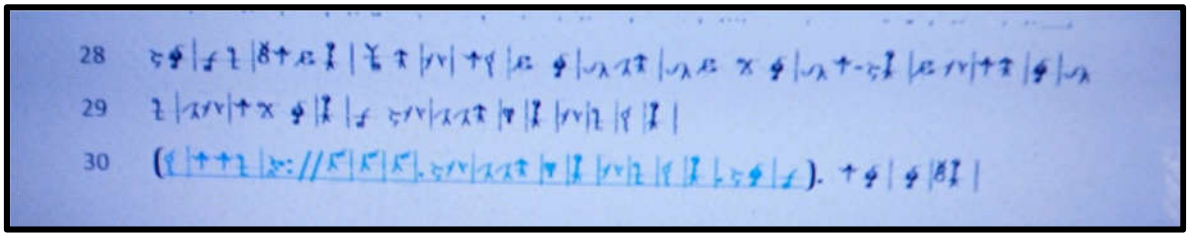

Figure 7:

DISCUSSION

In the present study, using zoological structures and shapes, a unique script has been designed. The letters in the script are equivalent to English alphabets, (A-Z), very uniquely designed resembling majority of animal structures and concepts. As the alphabets are closely resembling the animal designs, it has been aptly named as zoologlyphics and the script is called as **Penguinka.** The alphabets have been created and incorporated in to MS, word, using an online software known as calligraphr. (**https://www.calligraphr.com/en/).** In this regard, a copyright application has also been filed with the **Indian Copyright Office**. **(Diary number: AT-18530/2025-CO**) The development of a zoology-inspired script serves two primary purposes. Firstly, it is designed to relate to and evoke specific concepts in the field of zoology. Zoology is an extensive discipline encompassing numerous subfields, including morphology, anatomy, histology, osteology, and cell biology etc. For students, retaining and recalling this vast array of information can be challenging. This script aims to support memory and learning by associating each alphabet character with specific zoological structures. By doing so, it helps learners to recall key concepts more easily and effectively, reducing cognitive load and enhancing conceptual retention. The other important aspect of developing a new script, is that it helps in developing and improving cognitive skills as suggested by Pae, (2020, 2022) in his script relativity hypothesis. According to this hypothesis, the unique shapes of the alphabets, including their spacing, accents, and horizontal or vertical orientations, may positively influence cognitive abilities such as reasoning, pattern recognition, conceptual understanding, inference, and overall perception of the world. In an interesting study, Lui and colleagues (2022) who investigated how proficiency in English and Chinese language skills could influence mathematical ability. Their findings revealed a direct correlation between language proficiency and arithmetic performance. Specifically, individuals who were proficient in either English or Chinese also demonstrated strong arithmetic skills. A similar conclusion was drawn by Logan (2004), who observed that Chinese learners excelled in arithmetic and algebra, whereas Western learners made notable advancements in geometry, which he attributed to differences in language learning and structure. In this context another interesting study by Kim, & Cao, (2022).have suggested that reading different scripts over a period of time, can also alter the brain organization and also arrangement of nerve neuronal networks. In a study on scripts and visual perception, Winskel (2022) observed that readers of visually dense and non-linear scripts, such as Thai and Sinhala, demonstrated stronger visual perception skills compared to those who read more linear scripts like the Roman alphabet. Based on these studies, it can be suggested that scripts featuring distinctive shapes with varied horizontal and vertical orientations may positively influence cognitive functions such as reasoning, conceptual understanding, and overall perception of the world. In this context, the newly developed script, *Zoologlyphics* (also referred to as script *Penguinka*), may offer similar cognitive benefits. It has the potential to enhance brain function by stimulating neural circuitry and visual processing pathways. Additionally, this script could assist learners in better retaining and recalling key zoological concepts through its symbolic association with animal morphology and structure, may also be used as a script to convey secret messages.

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