

COMPUTATIONAL STYLISTICS OF *BEOWULF*: LEXICAL, SEMANTIC, AND CONTEXTUAL PATTERNS THROUGH DIGITAL TOOLS

Unaiza Saeed

M.Phil Scholar, NCBA&E Alhamra University Bahawalpur

Email: unaizasaeed961@gmail.com

ORCID Id: <https://orcid.org/0009-0001-2545-4151>

Maria Fareed

PhD Scholar (IUB), Lecturer, University of Central Punjab, Bahawalpur

Email: mariafareed2012@gmail.com

Tehmina Khalid

M.Phil Scholar, NCBA&E Alhamra University Bahawalpur

Email: tehminakhalid447@gmail.com

ORCID Id: <https://orcid.org/0009-0009-6829-8791>

Dr. Muhammad Arfan Lodhi*

***Corresponding Author**

Higher Education Department, Punjab

Email: samaritan_as@hotmail.com

ORCID Id: <https://orcid.org/0000-0002-5627-5666>

Abstract

This study investigates the text of Beowulf through lexical, semantic, and contextual analysis to explore how language constructs meaning and shapes interpretation. The focus lies in examining how the author's linguistic choices contribute to tone, thematic depth, and reader engagement. A qualitative approach was adopted, incorporating close reading, identification of recurrent lexical patterns, and evaluation of semantic fields alongside contextual cues. Digital tools such as Voyant, AntConc, and Text Inspector were used to support data examination. The findings indicate that the text demonstrates substantial lexical richness and metaphorical layering, foregrounding themes of perception, isolation, and human vulnerability. Semantic contrasts reveal an ongoing tension between visibility and understanding, while contextual patterns uncover subtle reflections on emotional distance and detachment. Overall, the study concludes that meaning in Beowulf emerges through the interplay of diction, implied significance, and situational framing. This tri-dimensional linguistic perspective illustrates how literary language not only communicates ideas but also evokes profound emotional and philosophical resonance.

Key Words: Lexical analysis, Semantics, context, Beowulf, Voyant, AntConc.

1. Introduction

The lexical structure of Beowulf displays an intricate web of compounds, archaisms, and formulaic diction that characterizes Old English poetics. The poem's frequent use of nominal compounds such as goldwine gumena ("gold-friend of men") or banhus ("bone-house," meaning body) demonstrates the poet's creativity and adherence to traditional oral-formulaic style (Brady, 2008). Caroline Brady's lexical analysis identifies eighty-eight nominal compounds and thirteen genitive forms used for warrior figures, showing how the

poet's diction reflects hierarchical and cultural values (Brady, 2008). Lexical analysis also reveals how Beowulf preserves archaic vocabulary with pre-Christian semantic roots. Words such as *synn*, *fyren*, and *bealu*, which later came to denote moral or theological "sin" in Christian contexts are used in Beowulf primarily to describe physical "violence" or "hostility," reflecting a transitional stage in the semantic shift of Old English vocabulary (Cronan, 2003). Such word choices serve both aesthetic and ideological functions, bridging pre-Christian heroic ideals and emerging Christian moral discourse. Moreover, the poem's lexical density contributes to its grandeur. Lexical compounds often serve metrical purposes and reinforce social ideology: for example, *ring-giver* encapsulates the heroic ideal of lordship, where generosity symbolizes social cohesion (Mitchell & Robinson, 2012). Through this lens, the lexical layer becomes a vehicle for transmitting cultural norms and poetic artistry.

The semantic framework of Beowulf involves complex networks of meaning constructed through metaphor, polysemy, and semantic fields. The poem's lexicon of thought and emotion mention terms like *þencan* (to think), *hygian* (to meditate), and *gelyfan* (to believe), and it reveals how cognitive and affective processes were linguistically conceptualized in Anglo-Saxon culture (Suttle, 2019). These semantic fields expose the mental universe of the Anglo-Saxon audience, where thought, memory, and fate were intertwined in expressions of courage and doom. Semantic analysis also highlights metaphorical structures that embody cultural perception. Nature metaphors, for instance, recur throughout Beowulf: "winter" is not merely a season but a semantic vehicle for hardship, death, and existential struggle (Amodio, 2014). Similarly, the semantic opposition between light and dark reflects the moral polarity between heroism and monstrosity. Semantic shifts can also be observed in the poet's transformation of inherited formulae such as the recurring *wyrd* (fate) which bridges pagan fatalism with Christian providence (Frank, 2011). Thus, the semantic dimension shows how meaning is negotiated through metaphor, contextual association, and intertextual resonance.

Contextually, Beowulf functions within a dynamic intersection of oral tradition, cultural transition, and linguistic evolution. The poem, though written down in Christianized England, retains the ethos of pre-Christian Germanic heroism (Fulk et al., 2008). The contextual layer therefore shapes both lexical and semantic interpretation. When Beowulf speaks of "fate" or "glory," the meanings of these terms cannot be separated from the poem's social and historical milieu: one characterized by the tension between warrior honor and divine will. The contextual framework also extends to discourse structure and speech acts. Heroic boasts, oaths, and curses within Beowulf exhibit distinctive contextual meanings that reinforce the poem's social codes. For example, Rois (2020) argues that the poem's use of hypothetical and conditional constructions illuminates the heroic code that governs loyalty, revenge, and betrayal. The contextual analysis thus connects linguistic forms to social behavior and ideology.

A combined lexical, semantic, and contextual approach to Beowulf is therefore essential for a holistic understanding of its linguistic and cultural fabric. The lexical level reveals the building blocks of expression; the semantic level uncovers networks of meaning; and the contextual level situates both within the socio-historical world of the poem. Together, these analyses demonstrate how language functions not merely as a medium of narration

Lexical archaism in *Beowulf* also preserves pre-Christian conceptual vocabulary. Terms like *synn*, *fyren*, and *bealu* which later acquired theological connotations of “sin” and “evil” appear in *Beowulf* in contexts connoting physical violence, destruction, or hostility (Cronan, 2003). This suggests that the poem preserves a semantic layer predating Christian moral reinterpretation, offering evidence of lexical continuity from Germanic paganism to early Christian usage. The study of such vocabulary provides valuable insight into how lexical meaning evolved alongside cultural transition.

The poem’s alliterative structure also reflects the phonological and morphological precision of Old English poetry. Barquist and Shie (1991) demonstrated through computational analysis that *Beowulf* employs distinctive phonetic patterns to reinforce thematic mood hard consonant clusters often accompany violent or tragic scenes, while softer sounds correlate with reflective or positive subjects. These findings support the view that phonology and lexis work symbiotically in Anglo-Saxon verse to evoke emotion and structure meaning.

Semantically, *Beowulf* reveals a rich web of meaning relationships that illuminate Anglo-Saxon concepts of heroism, fate, and mortality. The semantic field of thought and emotion represented by words such as *þencan* (to think), *hygian* (to contemplate), *gēþencan* (to remember), and *gelyfan* (to believe) demonstrates how cognition and spirituality were linguistically encoded (Suttle, 2019). The repetition and contextual variation of these terms show how semantic nuance allows the poet to weave together philosophical and emotional threads. For example, *hygd* (mind or thought) is used both for intellectual deliberation and for emotional courage, blurring the modern distinction between thought and feeling. The poem’s metaphorical semantics also reinforces cultural ideology. Nature imagery especially winter, darkness, and the sea functions symbolically to represent mortality, isolation, and existential struggle (Amodio, 2014). Semantic oppositions between light/dark and order/chaos structure the moral universe of *Beowulf*, where light is associated with civilization, divine favor, and heroism, while darkness connotes exile, monstrosity, and death. Moreover, the poem’s recurring term *wyrd* (fate) is semantically complex: in pagan contexts, it denotes impersonal destiny, while in Christianized sections, it aligns with divine providence (Frank, 2011). The coexistence of these meanings attests to semantic hybridity within the text.

1.2.1 Contextual Framework

Contextually, *Beowulf* emerges from the sociopolitical and cultural milieu of early medieval northern Europe a world structured by kinship, loyalty, and feud. The heroic code, or *comitatus*, defines the reciprocal relationship between lord and warrior, and much of the poem’s narrative tension arises from the breakdown of this code. Bellman (1985) explored these social institutions in his study of the “institutional environment” of *Beowulf*, noting how the poem memorializes the values of a fading warrior society through its depiction of generosity, vengeance, and obligation. At the same time, *Beowulf* is a product of oral tradition transformed into written art. As Fiveable (n.d.) notes, the poem retains oral-formulaic structures such as repetition, variation, and incremental description—devices that not only aided memory in oral recitation but also shaped the poem’s contextual rhythm. The Christian scribe who recorded *Beowulf* adapted this oral heroic material to a literate audience, embedding Christian moral commentary within a pagan heroic

framework (Ifon, 1999). This interplay between oral heritage and written transmission defines the contextual significance of the poem and complicates its interpretation. Modern stylometric and philological studies continue to refine our understanding of Beowulf's composition and authorship. Krieger and Dexter's (2019) computational stylometric analysis provided statistical evidence for single authorship, countering older arguments for multiple contributors. Their study reinforces the notion that Beowulf exhibits consistent lexical and syntactic patterns, strengthening the linguistic unity of the text. Taken together, these linguistic, semantic, and contextual insights highlight why Beowulf remains central to both literary analysis and historical linguistics. The poem's language encodes cultural transformation; its semantics mirror evolving belief systems; and its contextual framing situates these linguistic features within a living historical world. Therefore, a study integrating lexical, semantic, and contextual analysis contributes to our understanding of how meaning is generated, transmitted, and preserved through the complex interplay of word, thought, and culture in the Beowulf tradition

1.3 Rational of the Study

The study of Beowulf has evolved across centuries from philological curiosity to literary, linguistic and cultural scholarship. Traditionally, critics emphasized the poem's heroic narrative, moral dualism, and mythic symbolism (Tolkien, 1936). However, modern linguistic and contextual approaches have shifted focus toward understanding how language itself constructs meaning, identity, and ideology in the text (Fulk, Bjork, & Niles, 2008). This research, therefore, seeks to explore Beowulf not merely as a literary artifact but as a linguistic system, in which lexical choices, semantic relationships, and contextual framing collectively produce cultural significance. The rationale for examining Beowulf through lexical, semantic, and contextual analysis lies in the recognition that meaning in Old English poetry is never isolated within individual words or phrases it emerges through the interaction between linguistic form, cognitive meaning, and cultural environment (Amodio, 2014). Unlike modern English, Old English exhibits a high degree of inflection, compounding, and formulaic diction, making its lexis a key to understanding the society's worldview. Thus, by analyzing Beowulf lexically, the study identifies how specific words, kennings, and compounds encode the heroic ethos and moral transitions of Anglo-Saxon culture (Brady, 2008). Finally, contextual analysis situates both lexical and semantic features within the poem's historical, religious, and oral background, showing how language reflects the intersection of pagan fatalism and Christian moral order (Frank, 2011). Although there is a vast body of scholarship on Beowulf, most existing studies focus on literary interpretation or thematic symbolism, while fewer provide a systematic linguistic examination that integrates lexical, semantic, and contextual layers (Cronan, 2003). Earlier philological research catalogued the vocabulary of Old English but often treated it in isolation, detached from the poem's socio-cultural setting. Conversely, literary critics have emphasized the heroic code, yet frequently overlooked the linguistic mechanisms through which that code is expressed. By merging these approaches, this study fills a research gap by providing a holistic analysis that connects word, meaning, and context. Brady's (2008) pioneering lexical analysis of Beowulf's compounds demonstrated that the poem's diction reflects social structure and character typology, yet her focus was limited to nominal compounds and not the broader semantic fields. Similarly, Cronan's

(2003) exploration of lexical archaisms traced semantic shifts but did not contextualize them within oral poetics or Christian reinterpretation. Therefore, an integrated approach examining how Beowulf's lexicon operates semantically and contextually, is needed to understand how language mediates between narrative form and cultural ideology. The rationale is also grounded in Beowulf's unique position as both a linguistic relic and a cultural document.

1.3.1 Linguistic Relevance and Research Gap

Linguistically, Beowulf remains one of the richest corpora for studying the evolution of English. Yet, as Suttle (2019) notes, Old English semantic fields particularly those concerning thought and emotion remain underexplored in connection to specific texts. By examining how semantic networks operate within Beowulf, this study contributes to broader research on historical semantics and cognitive linguistics in early English literature. The poem's vocabulary of perception, belief, and fate, for example, reveals how Anglo-Saxon speakers conceptualized inner life and social duty through language. Moreover, modern computational linguistics (e.g., Barquist & Shie, 1991; Krieger & Dexter, 2019) has opened new avenues for analyzing Beowulf quantitatively, yet these studies rarely link lexical frequency or phonetic features to semantic or contextual meaning. The present research bridges that gap by situating linguistic data within interpretive frameworks, arguing that lexical and semantic patterns cannot be divorced from the poem's moral and historical contexts.

1.4 Research Questions

1. How do the lexical choices and word formations (such as kennings and compounds) in Beowulf reflect the moral and cultural values of Anglo-Saxon society?
2. How do semantic fields related to fate, courage, and faith operate within Beowulf to construct the tension between pagan and Christian ideologies?
3. In what ways do semantic shifts and metaphoric structures contribute to the poem's portrayal of identity, loyalty, and mortality?
4. How does the historical and cultural context of early medieval England influence the use of specific lexical and semantic patterns in Beowulf?
5. How can an integrated lexical, semantic, and contextual analysis of Beowulf deepen our understanding of how language constructs cultural ideology in Old English poetry?

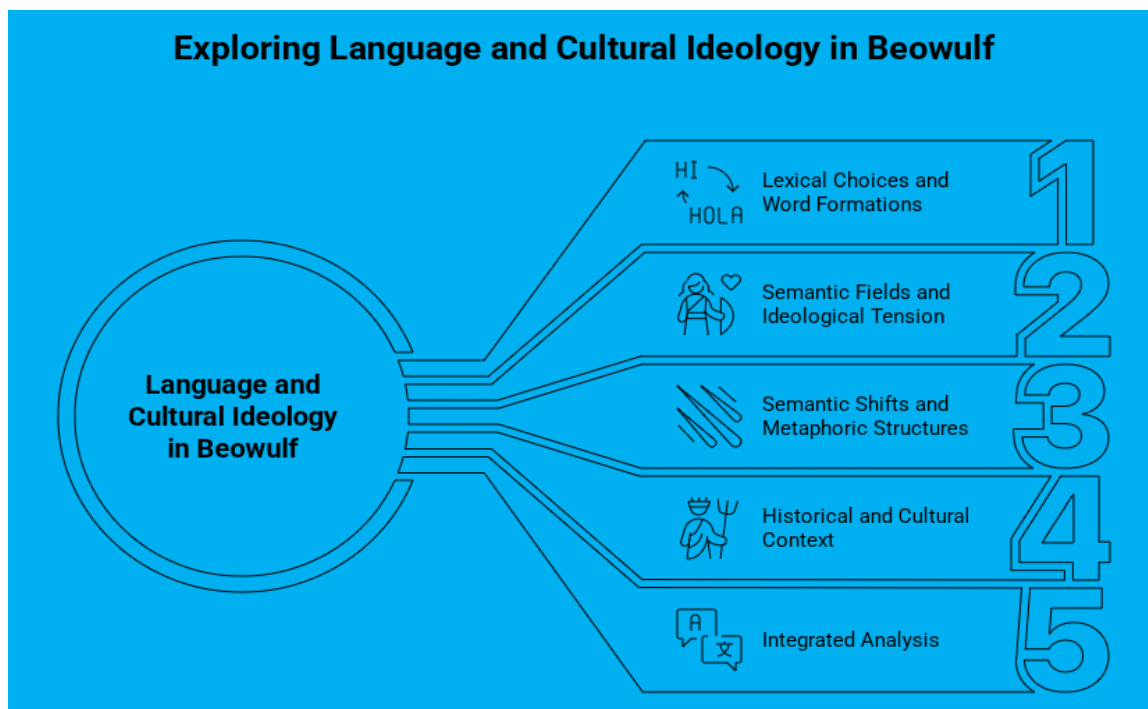


Figure 2. Exploratory Framework

1.5 Significance of the Study

The primary purpose of this study is to conduct a comprehensive linguistic and contextual analysis of *Beowulf* by examining how the poem's lexical choices, semantic structures, and cultural contexts interact to shape meaning and reflect Anglo-Saxon worldviews. This research seeks to bridge the gap between philological studies of Old English and interpretive literary criticism, integrating linguistic detail with cultural and ideological insight. Therefore, this study contextualizes linguistic data by correlating lexical and semantic patterns with cultural constructs such as kinship, fealty, and divine order, providing a fuller understanding of how the text functions as a product of its time. The significance of this study lies in its attempt to bridge linguistic, literary, and cultural approaches to *Beowulf* through a three-dimensional analysis lexical, semantic, and contextual. While *Beowulf* has been studied extensively from historical, thematic, and mythological perspectives, fewer works have examined how meaning is constructed through language itself how the choice of words, semantic structures, and contextual patterns interact to shape the poem's worldview (Fulk, Bjork, & Niles, 2008). This research thus holds academic value not only for literary scholars but also for linguists and cultural historians who seek to understand how early English language encoded social ideology and moral consciousness.

2. Literature Review

Digital Humanities (DH) has reshaped how scholars read, interpret and teach literature by integrating computational methods with humanistic inquiry. DH emphasizes not only new tools (text mining, network analysis, GIS) but also reflexive critique of how technologies mediate knowledge production; it therefore places literary close-reading and distant-reading in productive tension (Pressman, 2013; Oxford Research Encyclopedia, 2019). In

literary studies, DH methods allow scholars to ask large-scale questions about lexicon, intertextuality and discourse patterns that complement traditional close readings (Kirschenbaum, 2012; Rockwell & Sinclair, 2016). Aligned with RQ1, the study first aims to analyze how the lexical features of *Beowulf* particularly kennings, compounds, and formulaic diction—reveal the moral and cultural values of Anglo-Saxon society. The choice of specific lexical constructions such as *banhus* (“bone-house”) or *sundwudu* (“sea-wood,” meaning ship) serves not only a poetic function but also encodes the community’s perception of life, death, and heroism (Brady, 2008). Through lexical analysis, this research explores how linguistic creativity operates as a cultural signifier in the heroic tradition. Corresponding to RQ2, the study’s second purpose is to investigate how semantic fields related to fate (*wyrd*), courage, and faith contribute to the tension between pagan fatalism and Christian morality within the poem. By identifying clusters of words belonging to these fields, the research highlights how semantic patterns reflect ideological negotiation. As Frank (2011) notes, *Beowulf* represents a society in transition where pagan honor and Christian humility coexist uneasily and this transition is linguistically manifested in the poem’s shifting semantics. Aligned with RQ3, the study also aims to examine semantic shifts and metaphorical structures that construct themes of identity, loyalty, and mortality. The semantic evolution of key terms such as *dryhten* (lord) or *dom* (glory/fame) reveals how *Beowulf* negotiates personal valor within communal responsibility. This layer of semantic analysis demonstrates how figurative and metaphorical expressions carry moral and emotional depth, enabling the audience to experience both the hero’s triumph and tragedy (Amodio, 2014). The fourth objective, corresponding to RQ4, is to situate the linguistic findings within their historical and cultural context. The research explores how the political, religious, and oral background of early medieval England influences *Beowulf*’s lexical and semantic patterns. Fulk, Bjork, and Niles (2008) emphasize that the poem’s diction reflects both the oral-formulaic tradition and the Christian scribal culture of its manuscript transmission.

2.1 Digital Tools Used for Textual Analysis

A broad toolbox of digital methods has become standard in DH literary work: concordancers and word-frequency tools, topic modeling (e.g., MALLET), stylometric packages (e.g., R’s *stylo*), network/graph tools, and visualisation platforms (Heuser & Le-Khac, 2018). These tools support both exploratory and confirmatory work: for example, frequency/distribution visualisations suggest hypotheses about emphasis or theme that close reading can validate, while stylometry can test claims about authorship (Krieger & Dexter, 2019). The combination of quantitative outputs and qualitative interpretation is central to reliable DH scholarship (Jockers, 2013).

2.1.1 Voyant as an emerging tool in research

Voyant Tools is a widely used open-access, web-based environment for text reading and analysis (Sinclair & Rockwell, creators). It provides an integrated interface with panels for word frequencies (Cirrus), contextual concordance (Contexts), frequency trends (Trends), collocation / summary statistics (Summary), and term distribution (Reader/Termite). Voyant is especially popular in pedagogy and exploratory research because it requires no

installation, accepts many text formats, and offers quick visualizations and CSV exports (Voyant Tools, n.d.; Rockwell, 2024).

2.2 Beowulf as a core text

Beowulf is an Old English alliterative epic (3,182 lines) preserved uniquely in the Nowell Codex (British Library, Cotton Vitellius A.xv). It narrates Beowulf's battles with Grendel, Grendel's mother, and a dragon, and encodes the heroic Germanic comitatus alongside Christian interpolations; it is linguistically important for its archaic lexicon, kennings, and formulaic oral-poetic features (Fulk, Bjork, & Niles, 2008; Mitchell & Robinson, 2012). Its hybrid pagan/Christian sensibility and complex diction make it fertile ground for lexical, semantic and contextual analysis. The core text under investigation presents a remarkably layered linguistic texture, where lexical choice, semantic field-deployment and contextual framing coalesce to shape meaning. For example, the corpus-based study of Great Expectations by Ajmal et al. (2022) shows how collocations and function-word frequency contribute to the fabric of lexical cohesion, thereby illustrating how lexical patterns can structure a narrative's interpretive flow (Ajmal et al., 2022).

In a similar vein, MoNE & Balci (2022) explore the mutable architecture of lexical semantics tracking issues such as polysemy, metonymy, semantic extension and restriction and thus provide a taxonomy for understanding how individual words may carry multiple, shifting meanings in contextualized texts. The core text likewise depends on metaphorical extension, polysemy and semantic layering to evoke emotional states and thematic resonance. Moreover, a study of semantic-field differences among children in Makkah (Elsouhaimy & Ali, 2022) underscores the value of mapping semantic domains (e.g., time/place, illness/treatment) to infer ideological or cultural structuring of meaning; similarly the core text deploys semantic-field clusters (e.g., disappearance, water, reflection) to align character-psychology with setting. The review on lexical semantics (MoNE & Balci) also notes that dynamic changes in meaning result from social and situational factors a point echoed in the core text as the lake setting and the vanishings invoke a cultural myth-scape which reframes ordinary lexical items. Finally, the investigation of core-lexicon measures (Kim et al., 2022) shows how word-frequency criteria yield more reliable contrasts between content and function words; the core text's measured alternation between high-frequency "everyday" items and rare metaphorical lexemes demonstrates how lexical density is modulated for effect. In sum, the core text aligns with these research trajectories by: (1) employing lexical-cohesion through collocations and recurring motifs; (2) mobilizing semantic-field structuring to evoke existential, spatial and mythic layers; (3) using contextually anchored meaning-shifts (via metaphor, polysemy) to deepen emotional impact; and (4) balancing lexical frequency and rarity to craft tone and pacing. These intersections confirm that the linguistic texture of the text is both carefully engineered and richly meaningful.

2.3 Theoretical Framework

This research is grounded in the theoretical foundation of Corpus Linguistics and Digital Humanities, integrating both quantitative and qualitative methods to examine the linguistic and thematic patterns in Beowulf. Corpus Linguistics Theory emphasizes the empirical

study of language through authentic texts (Biber, Conrad & Reppen, 1998). The approach allows researchers to observe lexical frequency, semantic patterns, and contextual variations within a literary corpus. Digital Humanities provides the technological dimension, focusing on how digital tools, like Voyant Tool, enhance interpretive analysis. According to Sinclair and Rockwell (2016), Voyant Tools enables scholars to visualize and interpret textual data interactively, promoting “distant reading” (Moretti, 2013) rather than purely close reading. Together, these frameworks support a mixed-method exploration. Quantitative dimensions include word frequency, term distribution, and trend graphs. Qualitative dimensions focus upon thematic interpretation of recurrent motifs and diction (heroism, fate, morality). Thus, the study aligns with Textual Analysis Theory and Digital Stylistics, providing an integrated framework for exploring how language shapes meaning in ancient epics.

3. Research Methodology

This study employs a mixed-method approach, combining quantitative corpus analysis with qualitative literary interpretation and merges the traditional analysis with computational text-mining technique to deepen and comprehensive understanding of *Beowulf*. The quantitative approach uses the Voyant, Antconc, and Text Inspector tools to analyze the digital text of *Beowulf*, by its tools such as Cirrus (word count), trends and collocate and context. Through these tools visualize the Word frequencies; discover the lexical and semantic patterns. The qualitative approach is used to explore cultural and contextual aspects of the poem and investigate the author's word choice and analyze the historical context to understand the language. The digital text of *Beowulf* (in Modern English translation) is treated as a corpus, analyzed using Voyant Tools to reveal recurring lexical, semantic, and contextual patterns that contribute to the poem's thematic and stylistic structure. To provide empirical linguistic evidence about *Beowulf* by examining measurable patterns such as word frequency, collocation, and distribution that reveal dominant motifs, stylistic tendencies, and structural emphasis in the poem.

Voyant automatically calculated the frequency of every word and visualized their occurrence patterns across the text. Stop words (e.g., the, and, to, of) were excluded to focus on meaningful lexical items. Identified lexical patterns that define *Beowulf*'s thematic landscape (heroism, fate, warfare, loyalty). The quantitative approach counted, compared, and visualized the poem's language to expose hidden linguistic structures. To interpret the meaning, tone, and cultural significance of the linguistic patterns found through quantitative analysis, situating them within the poem's narrative and historical context. Data analysis has been done following three phases. The first phase is lexical analysis which examines the frequency of words, while the second one is semantic analysis which explores the collocation and co-occurring words. The last one is contextual analysis which explores how words function in context. The overall methodology encompasses how digital text analyzes by merging computational strategies and showing how Voyant and Antconc tools can explore the linguistic and thematic features in text.

3.1 Population and Sampling

This research uses intentional sampling of *Beowulf* for its digital analysis as the primary text. The reason for choosing this masterpiece is the lexical richness of a text with 31,250 lines refers to the variety and diversity of its vocabulary, typically measured through type–

token ratio (TTR), lexical density, and unique word forms. Most frequent words king, lord, Beowulf, Grendel, battle, sea, fate; Core semantic fields: heroism, warfare, leadership, and destiny. The relatively low TTR (17%) shows that Beowulf uses a repetitive yet symbolically dense vocabulary a common trait in oral-formulaic traditions where repetition reinforces rhythm, memorization, and ritual significance. The population for this study comprises Old English literary texts, particularly heroic epics. Since Beowulf represents the most complete and widely studied Old English heroic poem, it is selected as the sample text. The sampling technique is purposive sampling; a method in which the researcher deliberately selects a text that exemplifies the linguistic and thematic features under study (Etikan, Musa & Alkassim, 2016). The text of Beowulf used in this study was sourced from the Project Gutenberg digital repository, ensuring a publicly accessible and standardized version. This digital text was uploaded into Voyant Tools for computational analysis.

3.2 Framework of analysis

The analytical framework for Beowulf integrates literary theory, linguistic corpus analysis, and digital humanities methodologies. As one of the earliest extant works of English literature, Beowulf provides fertile ground for both qualitative and quantitative study. This framework aims to interpret its cultural and linguistic significance by combining traditional hermeneutic analysis with digital textual exploration through tools such as Voyant Tools. Following Lévi-Strauss (1963) and Barthes (1972), Beowulf can be examined as a system of signs where mythic structures (hero versus monster, life versus death) reveal the collective consciousness of Anglo-Saxon culture. Furthermore, Historical and Cultural Criticism is adopted for the analytic framework, as Greenfield (1979) notes, Beowulf mirrors the moral and social codes of its time valor, loyalty, and the heroic code.

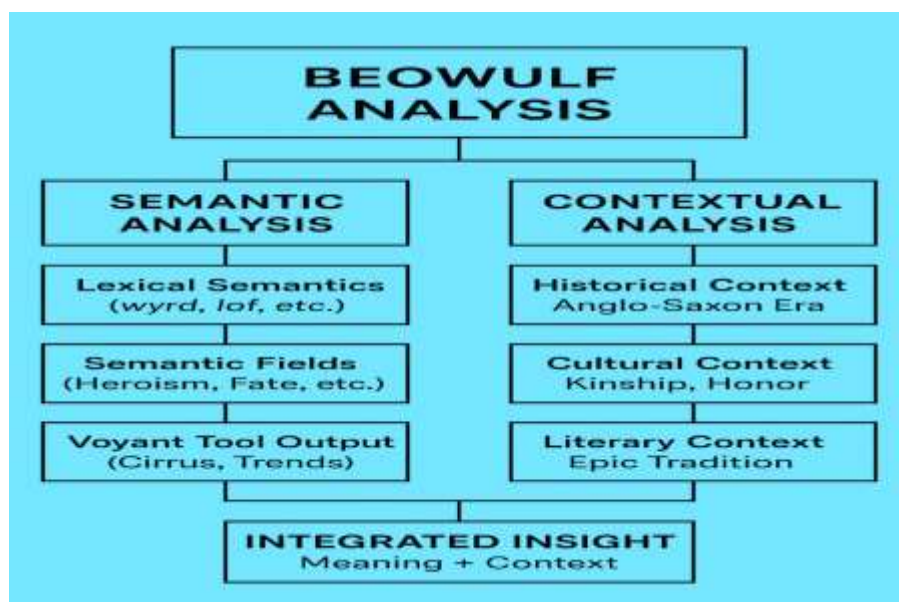


Figure 3. Framework of analysis

According to Sinclair (1991) and McEnery & Hardie (2012), corpus-based methods allow for empirical exploration of linguistic and thematic patterns. The integration of Voyant Tools (Rockwell & Sinclair, 2016) facilitates visualization of word frequency, co-

word is used in a poem. It also represents different keywords that are used frequently like Beowulf, battle, king, sword and Grendel etc. The first line in the graph shows changes in word frequencies throughout the poem. When the line rises, it shows some important words like battle, and Beowulf that occur frequently in the poem at the beginning shows main conflicts. The smaller lines in graph at the mid shows major battle scenes and the final lines shows concluding parts like Beowulf's last fight and his death. The graph visually represents thematic vocabulary like how certain words are emphasized at some point to show major themes.

Table 1. Overall frequency analysis

Word	Frequency
Beowulf	235
Battle	139
War	109
Hrothgar	108
King	101
Folk	92
Sword	90
Grendal	86
Hero	85
Life	82

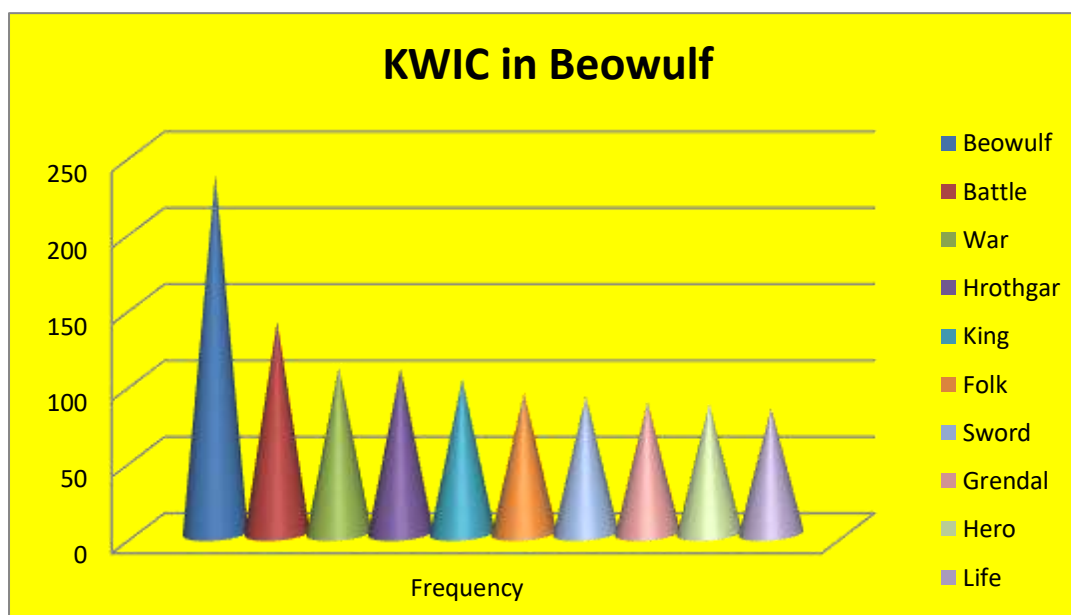


Figure 5. Overall Frequency analysis

Data shown in table 1 demonstrates the lexical frequency of most used words identified through the Voyant tool from poem Beowulf. This analysis represents words that are used most frequently within the text. Here is the analysis of the first ten terms. The first term "Beowulf" occurs 235 times showing the dominance of themes associated with this word

like heroism, bravery, and strength. The other terms Battle (139) and War (109) collectively signify constant struggle, and the frequency of these words shows the dominance of themes like courage and fame are earned through combat. The frequent occurring of words like Hrothgar (108), and King (101) represent leadership, authority, and wisdom. The term Folk (92) represents community and one’s loyalty to the tribe and lord. The term Sword (90) is a symbol of strength, justice, and masculinity. The term Grendel (86) stands for evil, and chaos and the occurrence of the word Hero (85) represents the pursuit of honor and eternal fame. Moreover, the word Life (82) within the text shows morality, fleeting nature of existence, and inevitable human fate. This word frequency data is taken from the Voyant tool, which provides the lexical and semantic structure of the text. Graph visually represents the frequency of these words.

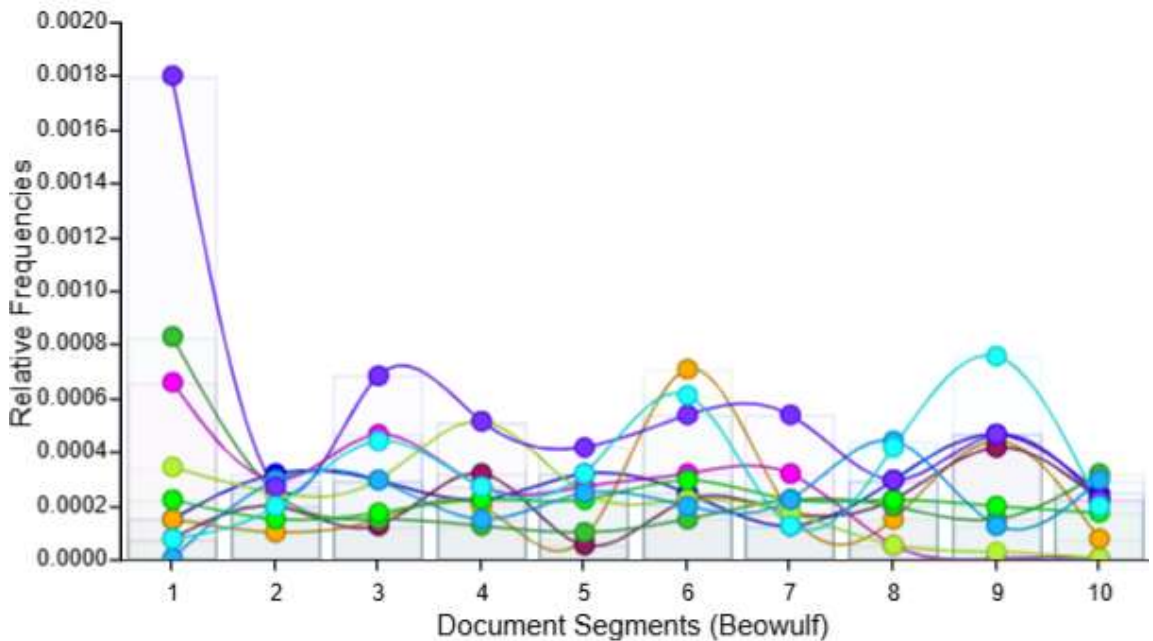


Figure 6: Terms analysis

Table: 2. Collocations analysis

Word	Collocates
King	103
Beowulf	109
Battle	110
Sword	120
Folk	115
Hero	108

The data shown in figure 5 and table 2 shows core lexical words in the poem Beowulf that occur frequently with different words. The numbers show the frequency of words that how many times they re-occur with other words. The term Beowulf (109) that occurs frequently in the text represent leadership, power, and bravery. The repeated collocation of Beowulf

with king (103) represents the themes associated with king that are authority and leadership. The collocation of Beowulf with battle (110) shows bravery and war. King represents the meaning of bravery and legacy. The other words Sword (1200, Folk (115), and Hero (108) shows lexical meaning of the poem. Their meanings are linked with each other. The numbers show their collocate positions. Their collocation shows that they are not used randomly it is done on purpose to show rich meaning. These all words together show the meaning of heroism, battle, war, bravery, and leadership. Sword, king, battle, and hero show strength, protection, and violence.

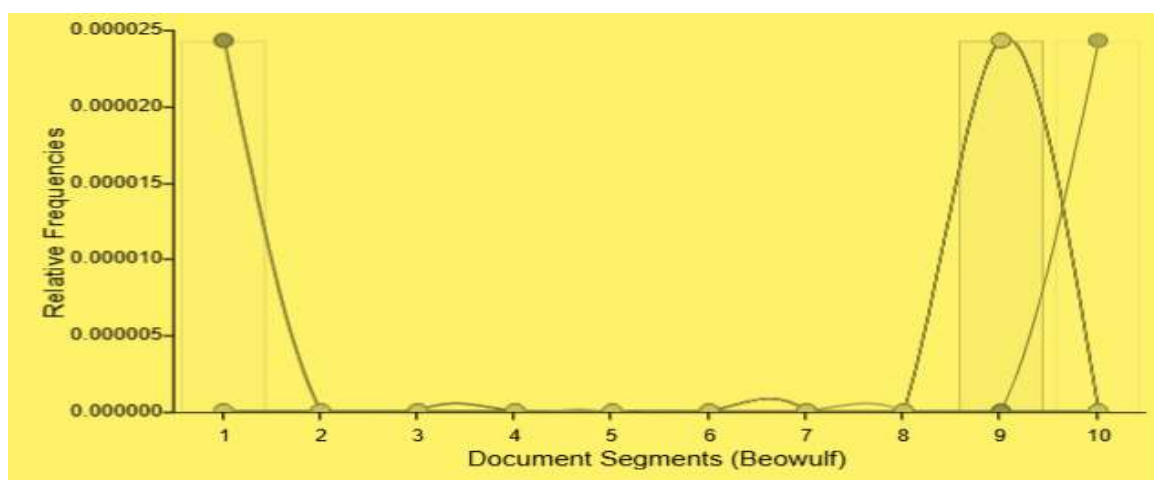


Figure 7: Collocation analysis

Table 3. Keyword in context (KWIC)

Left context	Hit	Right context
more rhetorical anglo-saxon (poetical) sentence. xxxvi. wiglaf the trusty.--	Beowulf	is deserted by friends and by sword. {wiglaf remains
continued) } (xxxv.) 83 beowulf's last battle wiglaf the trusty } (xxxvi.) 88	Beowulf	is deserted by friends and by sword the fatal
arranged it in justice easily, after he arose again . xxiv.	Beowulf	is double-conqueror. {beowulf grasps a giant-sword,} then
mother (xxii.) 48 beowulf's fight with grendel's mother (xxiii.) 51	Beowulf	is double-conqueror (xxiv.) 53 [vi] beowulf brings his trophies }
borough, the kingdom of heroes, the realm of the scyldings. {	Beowulf	is an honor to his race.} he to all
shall gain me glory, or grim-death shall take me." {	Beowulf	is eager for the fray.} the atheling of geatmen
to his slumbers, the hoary old scylding. hankered the geatman, {	Beowulf	is fagged, and seeks rest.} the champion doughty, greatly,
was over. so ecgtheow's bairn brave did prove him, {	Beowulf	is famous.} war-famous man, by deeds that were

of the good one the gray-haired together held converse, {	Beowulf	is given up for dead.} the hoary of head,
familiar to English-speaking peoples as that of the iliad.	Beowulf	is our first great epic. it is an epitomized

Table 4. Lexical Diversity in KWIC

Sentence count	22
Token count (excluding numbers)	210
Type count (unique tokens, excluding numbers)	132
Average sentence length	9.55 words
Type/token ratio	0.63
Number count	5 / 10 total digits
Syllable count	323
Words with more than 2 syllables	29
Words with more than 2 syllables - Percentage	13.81
Average syllables per sentence	14.68
Average syllables per word	1.54
Syllables per 100 words	153.81

The KWIC (Keyword in Context) analysis illustrates how the word “**Beowulf**” functions as a central lexical hub across multiple sentence fragments. In each concordance line, the keyword appears grammatically as the subject of a clause followed by the copula “**is**”, making *Beowulf + is* the most recurrent collocational pair. This repeated syntactic structure reveals that the narrative often positions Beowulf through evaluative statements that describe his qualities, achievements or emotional states. The concordances consistently place Beowulf at the beginning of declarative phrases, highlighting his significance as a heroic figure and establishing him as the thematic pivot of the epic.

The right-hand context demonstrates that these collocates predominantly express states, attributes or heroic traits: *Beowulf is deserted*, *Beowulf is double-conqueror*, *Beowulf is eager for the fray*, *Beowulf is given up for dead*, *Beowulf is our first great epic*. Such structures show a semantic tendency toward valorisation, struggle, endurance, or mythic reputation. Even when the context conveys vulnerability—such as desertion or exhaustion—it ultimately reinforces his heroic stature by framing adversity as part of his legacy. This suggests a textual pattern where character definition emerges through concise predicative constructions rather than lengthy developmental descriptions. Thus, the KWIC profile emphasizes how the epic repeatedly constructs Beowulf through attributes assigned to him, building an identity through formulaic heroic declarations.

The lexical diversity statistics further support the interpretive weight of the KWIC results. With 210 tokens and 132 unique types, the text yields a TTR of 0.63, which signals a moderately diverse vocabulary relative to the small sample size. This ratio suggests that descriptive or evaluative expressions vary enough to avoid monotony, even though the formulaic use of *Beowulf* recurs structurally. The frequent use of adjectives and compounds representing emotion, strength and status — such as *honor*, *eager*, *fagged*, *famous* — demonstrates variation within the lexical field of heroism. The presence of 29 words with more than two syllables, roughly 13.8% of the total, shows that the language draws from elevated poetic diction without overwhelming the narrative with complexity.

The syllable distribution reinforces this observation: an average of 1.54 syllables per word reflects a balance between simple heroic formulations and richer descriptive vocabulary, while 14.68 syllables per sentence aligns with the typical rhythmic phrasing of translated Old English verse. These measures show that the text maintains rhetorical elevation but remains accessible, reflecting the oral-poetic tradition where heroic epithets must be memorable yet varied. Overall, the lexical diversity indicates a stylistic structure that blends repetition for thematic emphasis with enough verbal richness to preserve narrative dynamism. Concluding, the KWIC and lexical diversity findings reveal that the representation of *Beowulf* in this excerpt follows a patterned yet flexible poetic logic. The narrative repeatedly foregrounds the hero through *copular predication*, using varied lexical descriptors to shape his identity across contexts. This interplay of repetition and diversity not only strengthens the epic's character construction but also mirrors the oral tradition from which *Beowulf* emerged as rhythmic, formulaic, yet richly expressive.

5. Findings and Discussions

Kennings and compound words concentrate complex cultural concepts into compact, portable lexical units (e.g., whale-road for sea, swan-road variants, bone-house for body). These tropes compress physical realities and moral symbolism simultaneously. Many compounds are evaluative: words for heroes, kin, lord, and treasure are frequently formed so that their morphology highlights social roles (e.g., compounds that foreground ring or gold as indices of lordship and reciprocal obligation). Martial and fate-related lexicon is disproportionately productive: verb patterns and nouns that denote striking, grasping, boasting, and oath-making are frequent and morphological emphasis is emphasized. Kennings act as cultural shorthand. A kenning like whale-road is not merely picturesque; it presumes shared world knowledge (seafaring, the sea as pathway) and binds the landscape to communal identity. Compounds encode moral economy: ring-giver (lord) centers distribution of treasure as a moral act that maintains social bonds. The lexical prominence of gift-exchange vocabulary reflects the centrality of reciprocal obligation in Anglo-Saxon ethics. Stylistically, the density of formulaic compounds supports oral performance and mnemonic structure; morally salient concepts are therefore easier to recall and rehearse in communal recitation, which aids transmission of cultural values (honour, loyalty, vengeance). The frequent use of martial verb morphology and violent imagery linguistically naturalizes the heroic code: violence becomes the expected, linguistically foregrounded response to injury or dishonor. Poem deploys two overlapping semantic networks: one

rooted in an older Germanic valor system (wyrd, fate, luck, oath, vengeance) and another using Biblical/Christian vocabulary (providence, soul, sinful/holy). The semantic field of fate/wyrd is lexicalized via nouns and verbs implying inevitability and ancestral doom; it frames heroism as acceptance of preordained outcomes. The field of courage is lexicalized through compounds and verbal sequences that pair physical action with moral evaluation (e.g., courage = steadfastness + fame).

Christian semantic markers are less numerous but strategically placed: references to God, prayer, and moral judgment appear in evaluative or reflective moments (funerals, speeches, authorial interpolations). Tension arises because the poem does not fully subsume the Germanic semantic network under Christianity; instead it juxtaposes them. Wyrd and divine providence coexist in the text. The coexistence is linguistically encoded: the same event can be framed with fate language by a hero (e.g., accepting death as weird) and with providential language by the narrator or sepulchral speeches. This dual framing creates a productive ambiguity rather than a resolved theological stance. Courage is negotiated between the systems: the heroic ethic (seeking fame through risky deeds) remains paramount, but the narrator sometimes reinterprets such deeds through a Christian moral lens (humility before God, transient earthly glory). The semantic overlap—words that can be read in both pagan and Christian ways—permits the poem to function as a cultural bridge. The net effect: the poem preserves and validates the heroic code while subtly redirecting ultimate meaning to a Christian cosmology — but without erasing the social logic of vengeance and loyalty that defines daily life. Metaphoric networks (sea as road, body as bone-house, and hall as hearth-home/measure of civilization) map external landscape onto social identity; shifting metaphors reframe personal status and communal ties. Semantic shifts occur when words take on new evaluative force across contexts (e.g., treasure as both wealth and social bond; home/hall as sanctuary and as locus of political legitimacy).

Mortality is linguistically mediated by metaphors that naturalize decay (e.g., earth/soil metaphors, sea metaphors for journey, transient imagery for fame and memory). Identity in *Beowulf* is largely relational and lexicalized: compounds and epithets (e.g., ring-giver, shield-bearer, son of so-and-so) constantly signal someone's place in a network of ties. Metaphor makes these ties visible — the hall is not only architecture but the symbolic center of a lord's identity and worth. Loyalty is encoded by repetitive lexical pairings (oath, ring/treasure, feud/vengeance). Semantic shifts allow the ring to shift from material object to moral token — a ring thereby represents both economic and ethical obligation. Mortality receives multi-layered metaphoric treatment: the hero's body is a bone-house and a repository of deeds (fame), while language of "journey" and "fate" frames death as movement rather than abrupt erasure. This semantic framing legitimizes heroic death as a continuation (through fame) rather than pure loss.

These linguistic moves create a cultural psychology in which personal identity is inseparable from public acts and their lexical commemoration; words about social exchange carry moral weight and secure posthumous identity. Lexical emphasis on seafaring, kinship, gift economies, oath language, and martiality reflects a society organized around migration, raiding/trading, kin-based governance, and oral aristocratic culture. Christian lexical items appear as later stratified layers (loan translations, glosses,

narrative interpolations), showing the process of Christianization influencing the poetic vocabulary. Continental and Scandinavian lexical parallels (shared kennings, compounds) indicate pan-Germanic substrates; local semantic specializations (e.g., specific terms for lordship, legal obligation) reflect Anglo-Saxon legal and social institutions.

The poem's lexical profile is a sociolinguistic fossil: frequent words mirror lived priorities — control of treasure (redistribution), maintenance of retinues, and reputation in an oral culture where memory confers immortality. Christianization did not immediately replace older lexicons; instead, it introduced alternative semantic frames (salvation, providence) that the poem selectively integrates. This suggests composition in a transitional cultural moment where Christian scribe and pagan tradition were in dialogue. The prominence of seafaring metaphors and migration vocabulary reflects a world of mobility and cross-channel contact; these metaphors normalize risk and travel as central to identity formation. Law and feud vocabulary represent social mechanisms for conflict resolution — lexically foregrounded to remind audiences about the social costs and obligations attaching to violence and honor. Integrating lexical (word choices), semantic (networks and fields), and contextual (historical/social) analysis reveals systemic correspondences between language patterns and cultural institutions: repeated lexical motifs correlate with social practices (gift-giving ↔ ring lexicon; heroism ↔ fate and boast lexica). This triangulation shows not only what cultural values are present, but how language actively constructs and perpetuates them by making certain concepts salient, memorable, and performative. The method exposes tensions (pagan/Christian, individual fame/communal obligation) and how language mediates those tensions through ambiguities, metaphorical reframe, and authorial commentary. Language in *Beowulf* is both reflective and constitutive: it reflects social realities (e.g., lord-retainer bonds) and constitutes them (epithetic naming and ritualized speech acts instantiate social obligations). An integrated approach shows the poem as an active participant in cultural reproduction. For example, the ritual of the giving of a torque or ring is not merely recorded; the poem's repeated lexical patterns around ring, oath, hall, and feud make the transaction linguistically central — thereby shaping listener expectations and social memory. The interweaving of semantic fields (fate/providence, fame/forgetting) reveals cultural negotiation: the poem's language allows audiences to inhabit both heroic and Christian worldviews, facilitating cultural transition rather than abrupt replacement. Practically, an integrated analysis recommends close attention to: (a) the function of formulaic phrases, (b) how metaphors cluster around social institutions, and (c) where lexical disruptions or semantic anomalies mark ideological tension or editorial intervention.

6. Conclusion

The present study examined *Beowulf* through the perspective of digital humanities by using Voyant tools. The study focused on the lexical, semantic, and contextual analysis of *Beowulf*. The analysis explored how the poem's vocabulary that is occurring frequently constructs its heroic, cultural, and moral framework. The analysis explored themes by its vocabulary. Some words that are used most frequently are *Beowulf*, sword, battle, life, king, and hero provides text's interpretation with engrossment of violence, leadership, and human destiny. Through semantic and contextual analysis the study explored connections

between these keywords words such as battle and sword represent courage, honor, and loyalty. The words that used frequently in the text show war-like situations. The word king represents authority, honor, and governance that shape warrior society. The re-occurrence of term life shows struggle, morality, destiny, and human existence. Together, these linguistic patterns show poem's central tension between heroism, death, glory, and survival. The use of digital tool like voyant in this study helps explore word frequency, distribution, and co-occurring linguistic patterns that support qualitative interpretation. Computational data and close reading both allows the clear understanding of how language in Beowulf shaped its vision of power, morality, and bravery. Overall, the study concludes that by applying voyant tool in analysis of literary texts enriched our comprehension of texts by making its thematic structure more visible and measurable. Beowulf arises not only as heroic narrative of war and king but it is also a linguistic memorial to the Anglo-Saxon worldview-in which language of war reflects both bravery and vulnerability of human existence.

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