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Comparative analysis of structural principles in multilingual dictionaries

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Abstract: This study investigates the structural principles of eight multilingual dictionaries encompassing English, Uzbek, and Russian, spanning domains such as anatomy, chemistry, economics, mathematics, computer science, taxation, spirituality, and general usage. The aim is to compare their organizational strategies, entry formats, and supplementary features to assess their effectiveness in meeting the needs of diverse target audiences, including students, professionals, and language learners.

A comparative analysis was conducted on the dictionaries' structural elements, including entry arrangement (alphabetical order, starting language, directionality), semantic depth (explanatory notes, synonyms, examples), grammatical and phonetic information, and supplementary features (e.g., tables, guides). The dictionaries were evaluated based on their accessibility, usability, and domain-specific utility, drawing from examples and structural patterns observed in each work.

Findings reveal that all dictionaries adopt alphabetical ordering, but their starting languages and directionality vary, reflecting intended users—e.g., bidirectional structures (A. Qosimov & M. Qosimova) enhance versatility, while unidirectional English-first designs (M. Shokirova & Sh. Nurullayev) prioritize scientific audiences. Semantic depth differs, with detailed annotations in anatomy and chemistry dictionaries aiding learners, contrasted by concise, practical entries in taxation and economics dictionaries. Grammatical markers and phonetic transcription are inconsistently provided, with most lacking pronunciation guides, limiting accessibility for non-native speakers. Supplementary features like periodic tables or abbreviation lists enhance usability in some cases.

The dictionaries' structures align with their specialized purposes, balancing accessibility and depth. However, the widespread absence of phonetic transcription and inconsistent grammatical detail hinder their effectiveness for language learners. Future editions could integrate these elements to improve utility across diverse audiences.

Keywords: Multilingual dictionaries, Structural principles, Lexicography, Domain-specific terminology, User accessibility.

Introduction: Multilingual dictionaries serve as critical tools for bridging linguistic and cultural gaps, particularly in specialized fields where precise terminology is essential. This study examines the structural principles of eight multilingual dictionaries, all of which include English, Uzbek, and Russian, and span various domains such as anatomy, chemistry, economics, mathematics, computer science, taxation, spirituality, and general usage. These dictionaries are: English-Uzbek-Russian, Uzbek-English-Russian Dictionary of Anatomic Terms by A. Qosimov and M. Qosimova (2006), English-Uzbek-Russian Dictionary of Chemistry Terms by M. Shokirova and Sh. Nurullayev (2013), English-Uzbek-Russian dictionary of tax and economic terms by A. Saidov and D. Yaxyoyeva (2008), English-Russian-Uzbek dictionary for mathematics specialists by G. Sobirova et al. (2004), Universal Dictionary by Z. Nuritdinova et al. (2012), English-Russian-Uzbek Educational Dictionary of Computer Science by D. Volkoviskaya et al. (2005), Uzbek-English-Russian dictionary of economic terms by T. Ergashev (2001), and Key to perfection: Uzbek-Russian-English dictionary of spirituality by N. Mahmudov et al. (2006). By comparing their organizational strategies, entry formats, and supplementary features, this analysis highlights their strengths and shortcomings in meeting

the needs of their target audiences.

METHODS

The study employed a qualitative comparative approach to analyze the structural principles of eight multilingual dictionaries. Materials included the dictionaries themselves, sourced from Uzbek publishers, covering specialized fields. Procedures began with their selection, ensuring all included English, Uzbek, and Russian, followed by a detailed examination. Each dictionary was assessed for four aspects: organizational structure (e.g., alphabetical order, directionality), entry content (e.g., explanatory notes, synonyms), grammatical/phonetic details (e.g., word classes, transcription), and supplementary features (e.g., tables, guides). Data collection involved extracting specific entries (e.g., “acetic acid” from M. Shokirova & Sh. Nurullayev, p. 20) and documenting observations in a structured format.

Analytical methods comprised qualitative comparison and content analysis. The former evaluated structural variations—such as A. Qosimov and M. Qosimova’s bidirectional design versus M. Shokirova and Sh. Nurullayev’s unidirectional flow—against criteria like accessibility and audience suitability. Content analysis dissected entry components (e.g., definitions, examples) to assess semantic depth and usability, comparing educational richness (e.g., A. Qosimov & M. Qosimova) with practical brevity (e.g., A. Saidov & D. Yaxyoyeva). Grammatical and phonetic inclusion was critiqued for learner support, noting widespread transcription absences. Supplementary features were reviewed for added value, such as M. Shokirova and Sh. Nurullayev’s periodic table.

Findings were synthesized narratively, highlighting strengths (e.g., detailed annotations) and weaknesses (e.g., phonetic gaps), with examples cited by page number. This method ensured a replicable process: acquire the dictionaries, analyze the same structural elements, apply consistent qualitative criteria, and report findings with specific evidence. Adjustments for edition variations may be needed, but the approach remains robust for replication.

RESULTS

The study achieved a comprehensive evaluation of eight multilingual dictionaries (English, Uzbek, Russian) across domains like anatomy, chemistry, and economics, revealing their structural strengths and limitations. All dictionaries adopt alphabetical order, with organizational results varying: A. Qosimov and M. Qosimova’s bidirectional anatomy dictionary effectively serves diverse medical users, while M. Shokirova and Sh. Nurullayev’s unidirectional chemistry dictionary optimizes for English-first learners. Entry content analysis shows A. Qosimov and M. Qosimova detailing 4500+ terms with notes, enhancing medical education, whereas D. Volkoviskaya et al. enrich tech vocabulary with phrasal verbs, and A. Saidov and D. Yaxyoyeva prioritize practical tax phrases. Grammatical findings indicate limited detail—G. Sobirova et al. provide word classes, but most lack phonetic transcription (e.g., “apex” without [ˈeɪ.peks]), reducing learner support. Supplementary features prove impactful: M. Shokirova and Sh. Nurullayev’s periodic table boosts chemistry usability, yet many lack aids like tables of contents. Results highlight strengths, such as flexibility in bidirectional designs and depth in annotations. However, weaknesses like transcription gaps and errors were also identified (e.g., Z. Nuritdinova et al.’s “ecmoq”). The study concludes that while specialized needs are met, integrating phonetic and grammatical enhancements would elevate these dictionaries’ effectiveness for broader audiences.

DISCUSSION

Organizational Structure and Entry Arrangement

A fundamental aspect of dictionary structure is the arrangement of entries. All eight dictionaries adopt an alphabetical order, a standard practice in lexicography that enhances accessibility. However, their starting languages and directional approaches differ, reflecting their intended users. For instance, A. Qosimov and M. Qosimova’s dictionary employs a bidirectional structure: the first half is English-Uzbek-Russian, while the second half shifts to Uzbek-English-Russian, marked by bold black text for Uzbek entries. This dual arrangement caters to both English-speaking learners seeking Uzbek and Russian equivalents and Uzbek-speaking users needing translations into English and Russian, making it versatile for medical students and professionals.

Similarly, T. Ergashev’s dictionary begins with Uzbek entries followed by English and Russian equivalents, prioritizing native Uzbek speakers, such as students and economic professionals, who require foreign language equivalents. In contrast, M. Shokirova and Sh. Nurullayev’s dictionary and G. Sobirova et al.’s work adopt a unidirectional English-Russian-Uzbek sequence, aligning with the dominance of English as an international scientific language. This structure suits learners and researchers familiar with English as the primary academic medium. D. Volkoviskaya et al.’s dictionary and A. Saidov and D. Yaxyoyeva’s dictionary also start with English, reflecting the global influence of English in technology and international economics. However, N. Mahmudov et al.’s dictionary opts for an Uzbek-Russian-English order, emphasizing cultural and spiritual concepts rooted in Uzbek heritage, targeting a

broad audience including foreign learners of Uzbek. Meanwhile, Z. Nuritdinova et al.'s Universal dictionary uses English as the base language.

The choice of starting language and directionality reveals a dictionary's intended audience and purpose. Bidirectional dictionaries like A. Qosimov and M. Qosimova's offer greater utility for diverse users, whereas unidirectional ones, such as M. Shokirova and Sh. Nurullayev's, prioritize efficiency for a specific linguistic flow, often at the expense of broader accessibility.

Entry Content and Semantic Depth

The depth and presentation of semantic information within entries vary significantly across these dictionaries, reflecting their domain-specific goals. A. Qosimov and M. Qosimova's work excels in providing detailed equivalents for over 4500 terms, often including explanatory notes in parentheses (e.g., "olfactory region – ҳид билиш соҳаси (бурун шиллиқ пардаси) – обонятельная область" [4: 69]), enhancing comprehension for beginners. It also lists multiple meanings (e.g., "articulation" with three distinct senses) and phrase examples (e.g., "arch of foot"), making it a robust tool for medical education.

M. Shokirova and Sh. Nurullayev's work similarly enriches entries with explanatory notes (e.g., "acetic acid – sirka kislota C2H4O2 (o'tkir hidi bor, rangsiz suyuq modda)" [6: 20]), supplemented by a periodic table and chemical formula reading guides. This additional content caters to chemistry students needing both translation and conceptual understanding. In contrast, A. Saidov and D. Yaxyoyeva's work focuses on practical phrases (e.g., "Automated system of customs clearance – Tovarlarni bojxonadagi rasmiylashtiruvidan o'tkazishning avtomatlashtirilgan tizimi – Автоматизированная система таможенного оформления товаров" [5: 7]) and synonyms (e.g., "actual cost (value)" and "real value" [5: 5]), prioritizing usability for tax professionals over exhaustive definitions.

D. Volkoviskaya et al.'s work stands out with its inclusion of phrasal verbs (e.g., "back-out - отменять (изменения), восстанавливать – (o'zgarishlarni) bekor qilmoq, (dastlabki holatni) tiklamoq" [8: 11]) and irregular verb forms (e.g., "draw (drew, drawn)" [8: 39]), alongside abbreviations like "IT – см information technology" [8: 63] reflecting the dynamic terminology of technology. G. Sobirova et al.'s dictionary provides synonyms and phrase examples (e.g., "union of sets – объединение множеств – to'plamlar yig'indisi, birlashmasi" [7: 68]), but its lack of transcription limits its pedagogical value. T. Ergashev's publication includes alternative Uzbek terms (e.g., "Банкротлик (синиш) – Bankruptcy, crash – Банкрот, банкротство" [1: 9]) and abbreviations (e.g., "ECU"), enhancing its relevance for economic practitioners.

N. Mahmudov et al.'s work offers nuanced entries with historical annotations (e.g., "vazir" with modern and archaic senses), using punctuation like semicolons and parallel lines to distinguish meanings and grammatical roles (e.g., "Абадий – вечный//вечно" [2: 15]). However, Z. Nuritdinova et al.'s work struggles with lacking transcription or detailed grammatical markers, reducing its utility for learners:

abjure to state publicly that you no longer agree with a belief or way of behaving. He abjured his religion/his life of dissipation. – отказываться, отрекаться – voz kechmoq, bosh tortmoq, tonmoq. [3: 5].

Dictionaries with richer semantic content, such as those by A. Qosimov and M. Qosimova and M. Shokirova and Sh. Nurullayev, are more effective for educational purposes, while those prioritizing brevity, like A. Saidov and D. Yaxyoyeva's, cater to practical application.

Grammatical and Phonetic Information

Grammatical and phonetic details are crucial for language learners, yet their inclusion varies across these dictionaries. G. Sobirova et al.'s publication marks word classes (e.g., "angle (n)"), a feature rare among the others, aiding users in understanding grammatical roles. D. Volkoviskaya et al.'s publication provides verb conjugations (e.g., "break (broke, broken)") and phrasal verbs, enhancing its utility for technical translation. N. Mahmudov et al.'s publication uses symbols like "//" to indicate conversion (e.g., "Дадил – смелий // смело" [2: 51]), offering subtle grammatical insights.

Conversely, A. Qosimov and M. Qosimova's publication, M. Shokirova and Sh. Nurullayev's publication, A. Saidov and D.Yaxyoyeva's publication, and T. Ergashev's work omit explicit word class labels, assuming user familiarity with the domain. Z. Nuritdinova et al.'s publication inconsistently marks categories (e.g., "wantonness noun [U]"), but errors in transcription (e.g., "Gg [dzi:]" [3: 4] instead of [ʤi:]) undermine its reliability.

Phonetic transcription is notably absent in most dictionaries, a significant drawback for learners. For instance, the absence of transcription in A. Qosimov and M. Qosimova's dictionary limits pronunciation guidance (e.g., apex could have been rendered as [ˈeɪ.peks]). This critique also applies to the dictionaries by M. Shokirova and Sh. Nurullayev, A. Saidov and D. Yaxyoyeva, G. Sobirova et al., and D. Volkoviskaya et al. Only Z. Nuritdinova et al. attempts transcription in its

alphabet guide, but errors render it ineffective. This omission across specialized dictionaries limits their effectiveness for non-native speakers unfamiliar with English pronunciation.

Supplementary Features and Usability

Supplementary features enhance a dictionary's usability. The Shokirova and Nurullayev publication includes a periodic table, formula reading guides, and borrowed word lists (e.g., "a.m. ante meridiem - kun yarmidan oldin - до полудня" [6: 327]), making it a comprehensive resource. The dictionary by D. Volkoviskaya et al. offers abbreviations and phrase examples, while the Ergashev publication lists organizations (e.g., "ЮНИДО (БМТнинг саноатни ривожлантириш бўйича ташкилоти) - UNIDO (United Nations Industry Development Organization) - ЮНИДО (Организация ООН по развитию промышленности)" [1: 57]) and synonyms, boosting practical utility. The Qosimov and Qosimova publication provides alphabets for all three languages, aiding navigation. However, the Saidov and Yaxyoyeva publication lacks transcription, reducing accessibility. The works by G. Sobirova et al. and Z. Nuritdinova et al. omit tables of contents, a feature whose absence is unusual for usability and complicates term lookup. The Mahmudov et al. publication compensates with its focus on cultural annotations, though it lacks phonetic aids.

Strengths and Weaknesses

Strengths vary by dictionary. A. Qosimov and M. Qosimova's bidirectional structure and detailed notes excel for medical education. M. Shokirova and Sh. Nurullayev's supplementary materials support chemistry learners. D. Volkoviskaya et al.'s verb forms and abbreviations suit tech professionals, while T. Ergashev's alternative terms aid economic practitioners. N. Mahmudov et al.'s cultural depth serves spiritual learners, and A. Saidov and D. Yaxyoyeva's synonyms enhance tax-related translation.

Weaknesses include the widespread lack of transcription, limiting pronunciation guidance, and inconsistent grammatical detail, as seen in A. Saidov and D. Yaxyoyeva and Z. Nuritdinova et al.. Z. Nuritdinova et al.'s typographical errors, such as ecmoq instead of esmoq in "breath 1. [U] the air that goes into and out of your lungs. ... - (o'zb.) nafas olmoq, nafas chiqarmoq, ecmoq (shamol)" [3: 73] further detract from usability.

CONCLUSION

The structural principles of these multilingual dictionaries reflect their specialized purposes, balancing accessibility, depth, and practicality. Bidirectional designs (e.g., A. Qosimov and M. Qosimova) offer flexibility, while rich annotations (e.g., M. Shokirova and Sh. Nurullayev) enhance learning. However, the absence of phonetic transcription and inconsistent grammatical markers across most dictionaries hinder their effectiveness for language learners. Future editions should integrate phonetic transcription and consistent grammatical markers, leveraging the strengths of each dictionary to enhance usability for diverse audiences.

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