THE COGNITIVE ANCHOR: RE-EVALUATING THE GRAMMAR-TRANSLATION METHOD FOR SYNTACTIC PRECISION IN THE AGE OF AUTOMATED TRANSLATION

KOGNITIV LANGAR: AVTOMATLASHTIRILGAN TARJIMA DAVRIDA SINTAKTIK ANIQLIKNI TA'MINLASHDA GRAMMATIK TARJIMA METODINI QAYTA BAHOLASH

КОГНИТИВНЫЙ ЯКОРЬ: ПЕРЕОСМЫСЛЕНИЕ ГРАММАТИКО-ПЕРЕВОДНОГО МЕТОДА ДЛЯ ДОСТИЖЕНИЯ СИНТАКСИЧЕСКОЙ ТОЧНОСТИ В ЭПОХУ АВТОМАТИЗИРОВАННОГО ПЕРЕВОДА

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Annotatsiya (Abstract – O'zbek tilida)

Ushbu tadqiqot Grammatik-tarjima metodini (GTM) avtomatlashtirilgan tarjima tizimlari va neyron mashina tarjimasi (NMT) ustunlik qilayotgan zamonaviy sharoitda universitet darajasidagi ingliz tilini chet tili sifatida o'rganuvchilarning (EFL) sintaktik aniqligini oshirish uchun kognitiv langar sifatida qayta baholaydi. Kognitiv yuklanish nazariyasi, Ko'nikmalarni egallash nazariyasi, Payqash gipotezasi, Axborotni qayta ishlash chuqurligi nazariyasi va Deklarativ-protsedurali model kabi ilg'or kognitiv-nazariy asoslarga tayangan holda, tadqiqot GTM asosidagi tizimli ta'lim tarjima texnologiyalari bilan to'ldirilgan kommunikativ o'qitishga qaraganda chuqurroq sintaktik ishlov berishga yordam berishini o'rganadi. 14 haftalik aralashuv davomida eksperimental va nazorat guruhlariga bo'lingan 72 nafar bakalavr talabalari ishtirokida kvazi-eksperimental pretest-posttest dizayni amalga oshirildi. Natijalar GTM guruhida sintaktik aniqlik, gaplarning murakkabligi, xatolarning kamayishi va metalingvistik xabardorlikda statistik jihatdan sezilarli o'sishni ko'rsatdi (p<0.01). Tadqiqot xulosalari shuni ko'rsatadiki, GTM strategik jihatdan modernizatsiya qilinganda va texnologik qiyosiy vazifalar bilan integratsiya qilinganda, avtomatlashtirish davrida tarkibiy kompetentsiyani kuchaytiruvchi kognitiv stabilizator vazifasini o'taydi.

Kalit so'zlar: *Grammatik-tarjima metodi, sintaktik aniqlik, kognitiv yuklanish nazariyasi, avtomatlashtirilgan tarjima, deklarativ-protsedurali model, EFL (Ingliz tili chet tili sifatida).*

Abstract (English)

This study re-evaluates the Grammar-Translation Method (GTM) as a cognitive anchor for enhancing syntactic precision in university-level English as a Foreign Language (EFL) learners within the contemporary landscape dominated by automated translation systems and neural machine translation (NMT). Drawing upon advanced cognitive-theoretical frameworks including Cognitive Load Theory, Skill Acquisition Theory, Noticing Hypothesis, Depth of Processing theory, and Declarative-Procedural Model, the study examines whether structured GTM-based instruction fosters deeper syntactic processing compared to communicative instruction supplemented by translation technologies. A quasi-experimental pretest–posttest design was implemented with 72 undergraduate students divided into experimental and control groups over a 14-week intervention. Findings indicate statistically significant gains in syntactic accuracy, clause complexity, error reduction, and metalinguistic awareness in the GTM group ($p < .01$). Results suggest that GTM, when strategically modernized and integrated with reflective technological comparison tasks, functions as a cognitive stabilizer enhancing structural competence in the era of automation.

Keywords: *Grammar-Translation Method, syntactic precision, cognitive load theory, automated translation, declarative-procedural model, EFL*

Аннотация (Русский язык)

В данном исследовании метод грамматического перевода (GTM) переоценивается как когнитивный якорь для повышения синтаксической точности у студентов университетов, изучающих английский как иностранный язык (EFL), в современных условиях доминирования систем автоматизированного и нейронного машинного перевода (NMT). Основываясь на передовых когнитивно-теоретических базах, включая теорию когнитивной нагрузки, теорию овладения навыками, гипотезу «замечания» (Noticing Hypothesis), теорию глубины обработки и декларативно-процедурную модель, в работе изучается, способствует ли структурированное обучение на основе GTM более глубокой синтаксической обработке по сравнению с коммуникативным обучением, дополненным технологиями перевода. Квазиэкспериментальный дизайн (претест-посттест) был реализован с участием 72 студентов бакалавриата, разделенных на экспериментальную и контрольную группы в течение 14-недельного вмешательства. Результаты указывают на статистически значимый рост синтаксической точности, сложности предложений, сокращение ошибок и повышение металингвистической осведомленности в группе GTM ($p < 0.01$). Результаты позволяют предположить, что GTM, при стратегической модернизации и интеграции с рефлексивными задачами по технологическому сравнению, функционирует как когнитивный стабилизатор, повышающий структурную компетентность в эпоху автоматизации.

Ключевые слова: *Грамматико-переводной метод, синтаксическая точность, теория когнитивной нагрузки, автоматизированный перевод, декларативно-процедурная модель, EFL (Английский как иностранный язык).*

1. Introduction

The exponential growth of automated translation technologies, particularly neural machine translation (NMT) systems, has transformed language learning practices globally. While such tools provide accessibility and speed, they raise concerns regarding learners' declining syntactic precision and structural awareness. University-level EFL students increasingly rely on automated translation outputs, often bypassing deep grammatical processing. This phenomenon necessitates reconsideration of traditional pedagogical methods previously dismissed as outdated. The Grammar-Translation Method (GTM), historically criticized for limited communicative orientation, emphasized explicit grammar instruction, contrastive analysis, and translation accuracy. This study proposes that GTM may serve as a cognitive anchor—a stabilizing framework reinforcing deep syntactic encoding in learners' developing interlanguage systems.

The present research investigates whether GTM-based instruction enhances syntactic precision more effectively than communicative instruction supported by translation technologies. It also examines how cognitive mechanisms such as noticing, working memory regulation, and proceduralization contribute to structural development.

2. Literature Review and Theoretical Framework

2.1 Historical Perspective on GTM

GTM emerged from classical language instruction emphasizing grammatical analysis and translation of literary texts. Although communicative approaches later dominated SLA pedagogy, scholars have acknowledged that GTM cultivated metalinguistic awareness and syntactic sensitivity.

2.2 Cognitive Load Theory

Cognitive Load Theory (Sweller, 1988) posits that instructional design must manage intrinsic, extraneous, and germane cognitive load. GTM tasks, involving structured translation and syntactic parsing, may increase germane load, promoting schema construction and long-term retention.

2.3 Skill Acquisition Theory

According to Skill Acquisition Theory (DeKeyser, 2007), language learning progresses from declarative knowledge to proceduralized skill through practice. GTM reinforces declarative syntactic knowledge which can later become automatized through repeated structured practice.

2.4 Declarative–Procedural Model

Ullman's Declarative–Procedural Model (2001) distinguishes lexical knowledge stored in declarative memory from rule-based grammar processed in procedural memory. Explicit

grammar instruction may initially rely on declarative memory but supports eventual procedural consolidation.

2.5 Noticing and Depth of Processing

Schmidt's Noticing Hypothesis (1990) and Craik & Lockhart's Depth of Processing theory suggest that conscious attention to form enhances acquisition. Translation tasks requiring syntactic comparison encourage deeper processing than passive acceptance of machine-generated output.

3. Methodology

A quasi-experimental design was implemented with 72 undergraduate EFL students (B2 level). Participants were divided into experimental (GTM-based) and control (communicative + automated translation use) groups. The intervention lasted 14 weeks with three 60-minute sessions weekly.

Instruments included syntactic accuracy tests, clause complexity indices, timed argumentative writing tasks, oral structured translation tasks, and a metalinguistic awareness questionnaire. Data were analyzed using paired-sample and independent-sample t-tests with significance set at $p < .05$.

4. Results

The experimental group demonstrated significant gains in subordinate clause density (increase of 32%), reduction of syntactic errors (−41%), and improved passive construction accuracy (from 61% to 85%). The control group showed modest gains (12% improvement). Differences were statistically significant ($p < .01$).

Metalinguistic awareness scores improved markedly in the GTM group, suggesting enhanced structural consciousness.

5. Discussion

The findings indicate that GTM functions as a cognitive anchor stabilizing syntactic processing. Through controlled translation and explicit structural comparison, learners engage deeper cognitive mechanisms including germane load optimization and noticing. In contrast, automated translation tools may reduce active processing, potentially weakening long-term structural retention.

Integrating GTM with technology—such as post-editing machine translation outputs—may provide balanced pedagogy combining precision and communicative fluency.

6. Conclusion

This 2026 CALL study demonstrates that the Grammar-Translation Method retains significant pedagogical value for syntactic precision in higher education. In the age of automated translation, GTM serves not as an outdated relic but as a cognitive anchor fostering structural competence, metalinguistic awareness, and controlled linguistic processing.

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