

VerbiNavi: A Grammar-Scaffolding Tool With Color-Coding and Spatial Navigation for Teaching and Learning English Tenses at Beginner Level

Nick Koretsky

Independent Researcher, Russia

Building on the navigizer concept (Koretsky, 2024), this paper presents further developments in combining visual grammar structuring with integrated navigation in English tenses to accelerate language acquisition.

Keywords: verb grammar, English tenses, ESL, verbal GPS, digicolor navigation, grammar scaffolding, high-precision verbal grammar, verbinavi

Introduction

English verb forms and complex tense system represent one of the primary hurdles for English as a Second Language (ESL) learners. Beginner and low-intermediate students frequently struggle to navigate these forms, often experiencing high levels of cognitive load and frustration. To mitigate these difficulties, this study explores a new approach to verb grammar acquisition.

Research and Development

Usage Frequency

English tenses exhibit varying frequencies of use, which can be mapped onto a standard tense table. Notably, tenses with the highest frequency are typically clustered in the upper-left quadrant, while those with minimal frequency appear in the lower-right.

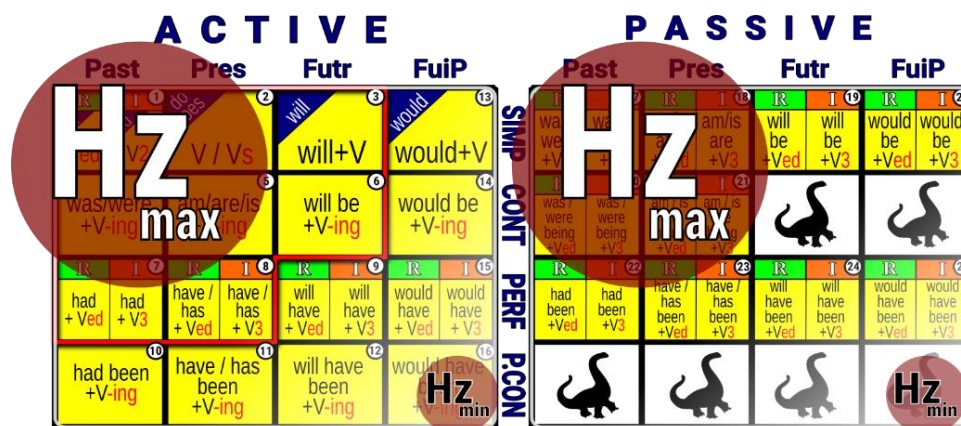


Figure 1. Usage frequency distribution.

This spatial distribution provides a logical foundation for choosing the most frequent tenses for studying at beginner level.

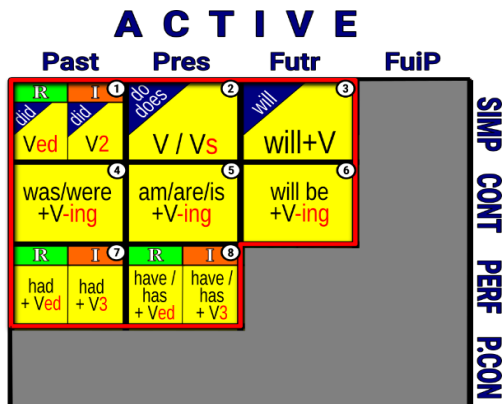


Figure 2. A choice of tenses for beginners.

It builds a navigational framework that reduces cognitive load and fosters more intuitive language acquisition for ESL learners. To address the morphological distinctions between regular and irregular verbs, the Figure 2 incorporates distinct sub-cells within the primary tense grid. Dual designations (marked ‘R’ and ‘I’) provide separate visual descriptions, allowing learners to differentiate conjugation of regular and irregular verbs without losing the overall structural context.

Digital Remapping of Tenses Grid

Traditional naming of English tenses presents a significant cognitive load for beginner-level ESL learners. Terms like “Present Continuous” and “Past Perfect” may appear intuitive to native speakers. However, they are difficult for foreign learners, particularly children, to comprehend and memorize. Furthermore, these labels can obscure the navigational function of the English tense system. To address this issue, an alternative numerical navigation system is proposed. Figures 1 and 2 illustrate the numerical assignments for each tense cell. Remapping the traditional tense grid from words to numbers reduces cognitive load and simplifies navigation within the English tense system.

Reference Cards

Beginners often struggle with correct sentence-building and need step-by-step guidance in each tense with each type of sentence. The best way to address this need is a detailed conjugation table for a given tense. Figure 3 shows an example of such conjugation table for the tense #2 (Present Simple). Since there is a need in a reference card for each individual tense a set of cards works best for this situation. Figure 4 shows a set of such reference cards with individual number on each card.

| + | ? | - |
|-----------|-----------------|-------------------|
| I work | Do I work ? | I do not work |
| You work | Do you work ? | You do not work |
| He works | Does he work ? | He does not work |
| She works | Does she work ? | She does not work |
| It works | Does it work ? | It does not work |
| We work | Do we work ? | We do not work |
| You work | Do you work ? | You do not work |
| They work | Do they work ? | They do not work |

PRESENT SIMPLE

Figure 3. Sample card.

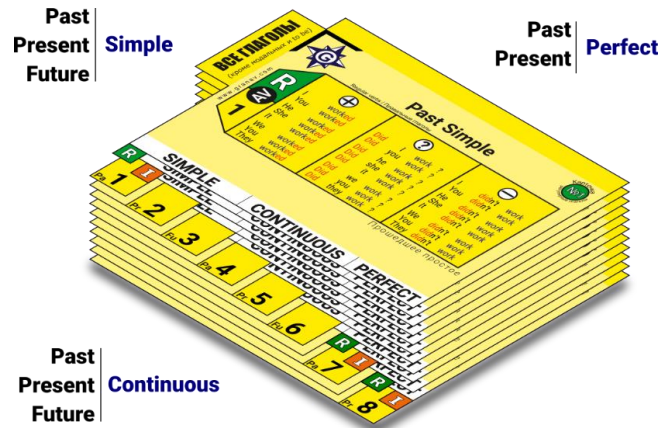


Figure 4. A set of reference cards.

Each card in a set has a side-tab (to distinguish between different sets of cards) and a bottom-tab (to navigate between cards within a set).

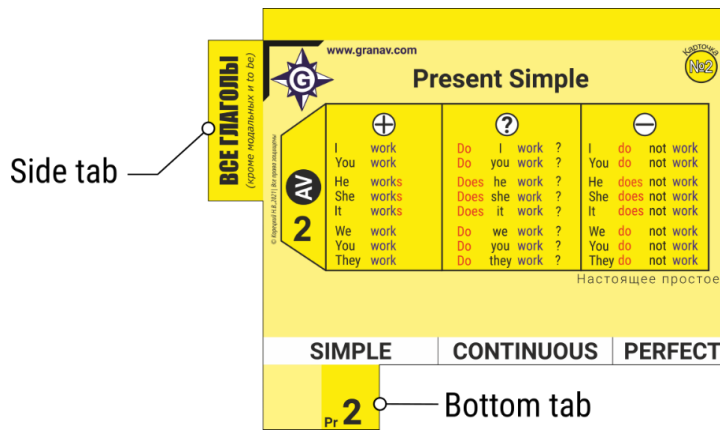


Figure 5. Side and bottom tabs.

Beginner ESL students also often struggle with the nuances of “to be” conjugation, leading to recurring grammatical inaccuracies. Providing a clear visual distinction through dedicated set of reference cards of the verb “to be” with different color (pink) effectively addresses these difficulties and improves learner outcomes.

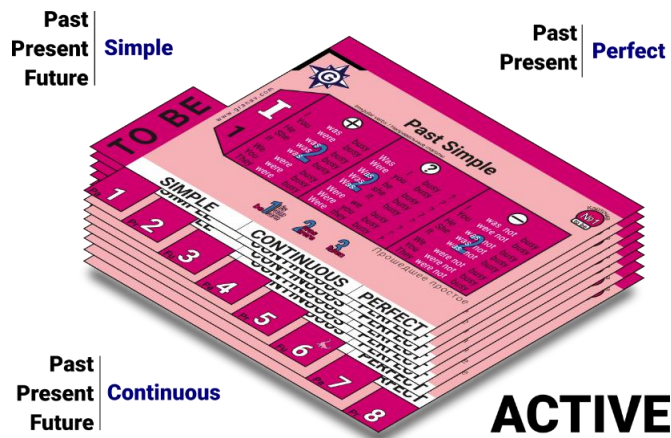


Figure 6. A set of “to be” reference cards.

Side Tabs Switch

Both pink and yellow sets of reference cards work together as a unity.

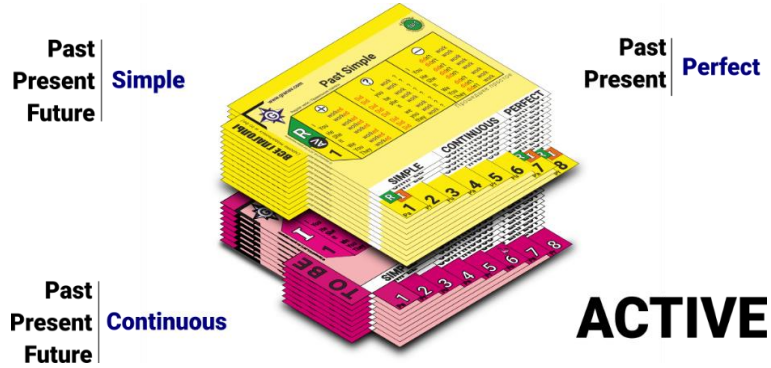


Figure 7. Pink and yellow cards.

To switch between the pink set (conjugation tables of the verb “to be”) and the yellow set (conjugation tables of all other verbs) side tabs are used.

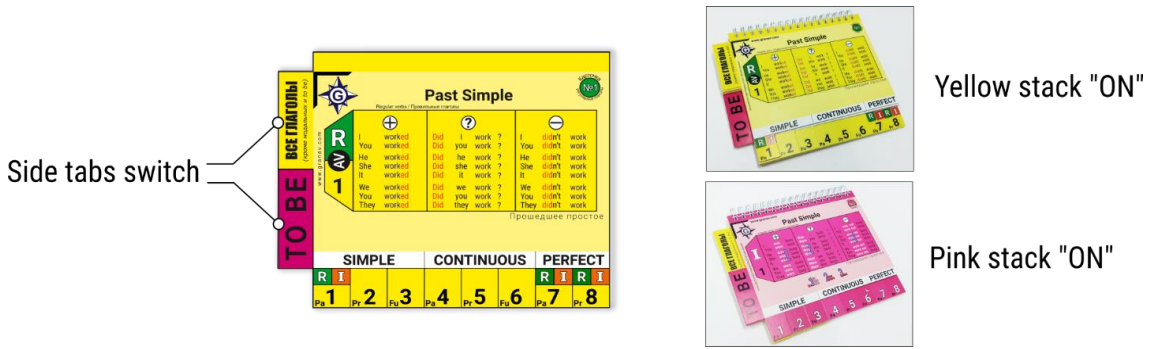


Figure 8. Side tabs switch.

Digicolor “Piano”

Each reference card has a color of its set. It also has an individual number. Number of each card relates to the system of digital remapping of English tenses grid as presented in Figures 1 and 2. Taken as a unity, all bottom tabs of reference cards in each set build a digicolor navigation feature—digicolor “piano”.

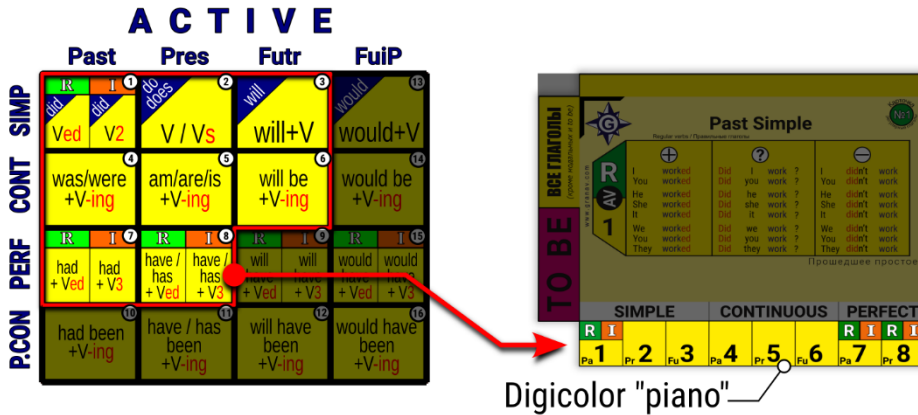


Figure 9. Digicolor “piano”.

This feature allows easy switching between reference cards within a set to browse sentence-building rules.

Sentence-building Frames

Another feature of VerbiNavi is a set of sentence-building frames. They work together with reference cards and help to focus student's attention on the learning material. Each frame has its number and a symbol of its function.

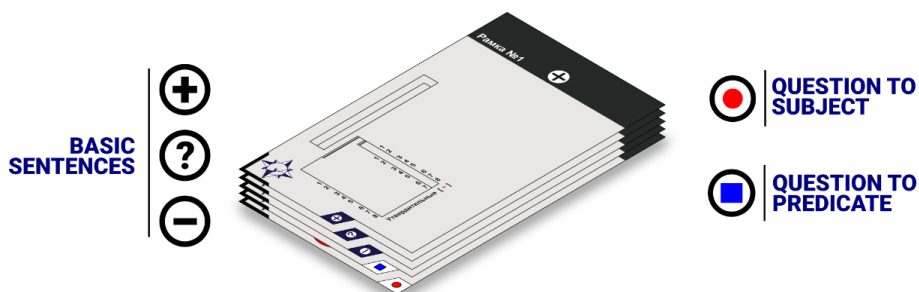


Figure 10. Sentence-building frames.

To perform its function a sentence-building frame is put over reference card as shown on a Figure 11.



Figure 11. Frames over reference cards.

Five sentence-building frames cover over 95% of the speaking needs of any student at beginner level. They are easy to memorize by using student's hand as a prompt.

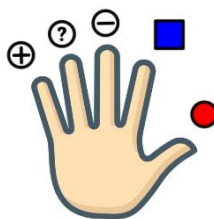


Figure 12. Hand as a prompt.

Practical Application

1. Sentence-building (scaffolding)

Imagine that a teacher needs to explain a student how to build an affirmative sentence in the 3rd person singular in Present Simple tense (e.g. she/to work). Here is the way to do it by using VerbiNavi as a scaffolding tool. Teacher gives instructions to a student:

Step #1. Open yellow card #2.

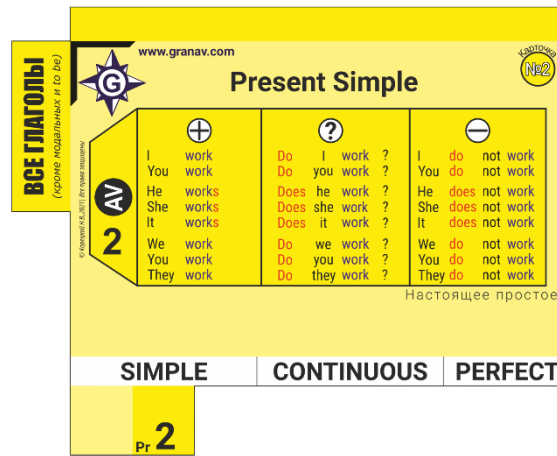


Figure 13. Yellow card #2 (Present Simple).

Step #2. Find a frame #1 (the gray one with a plus).

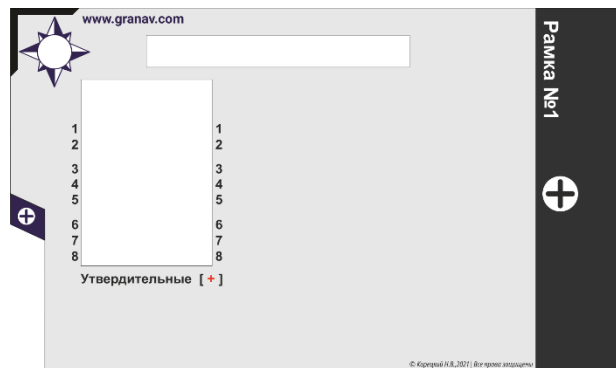


Figure 14. Frame #1 (+).

Step #3. Put the frame over the yellow card. Find “she” in the frame window. Read the sentence.

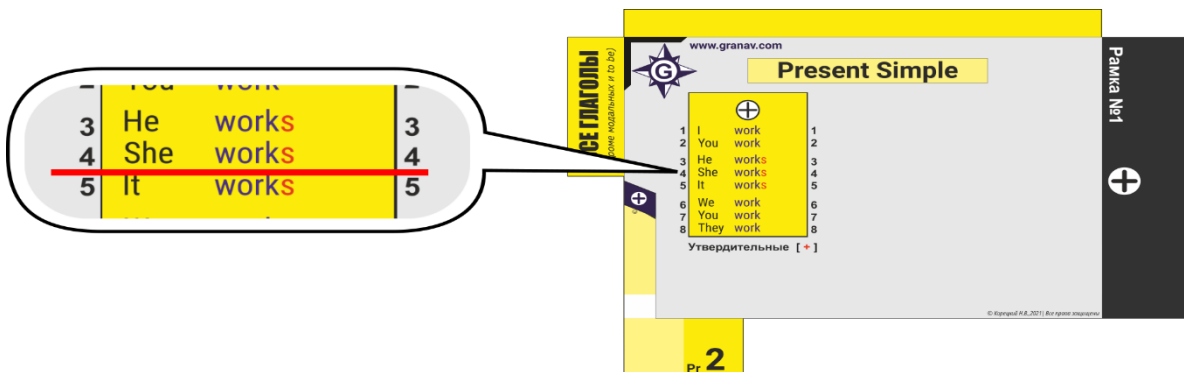


Figure 15. Frame over card.

Step #3 should be the end of a teacher’s instructions and a student should already be able to build a grammatically correct sentence. However, it is not always the case. For those cases when a student still struggles to build a sentence there are vertical numbers on the left and right sides of the frame cutout. Those

cutout line numbers work as a supporting system of navigation inside the cutout. They help when a student doesn't know pronouns properly. In such cases, instead of using a pronoun a teacher can convey it as a number. In case of the pronoun "she" a numeric equivalent will be "line #4".

Having this system of alternative navigation a teacher can explain any sentence structure of any tense using only colors and numbers. Here is a table of examples:

Table 1

Digicolor Scaffolding of a Sentence Structure

| # | Sentence | Card (# / color) | Frame # | Cutout line # |
|---|--------------------------------------|------------------|---------|---------------|
| 1 | She speaks English. | 2 | 1 (+) | 4 |
| 2 | When will they make tea? | 3 | 4 (■) | 8 |
| 3 | Where are you? | 2 | 4 (■) | 2 / 7 |
| 4 | Who is reading a book? | 5 | 5 (●) | |
| 5 | When has he done it? | 8 I | 4 (■) | 3 |
| 6 | This computer didn't work yesterday. | 1 R | 3 (-) | 5 |
| 7 | Had we done it? | 7 | 2 (?) | 6 |

2. Class management

By utilizing this standardized digicolor system, teachers can effectively manage heterogeneous groups of students regardless of class size or proficiency levels. The implementation of concise, directive prompts—such as "Class, open yellow card #2"—facilitates near-instantaneous synchronization, ensuring all students are focused on the specified Present Simple conjugation table. These streamlined commands reduce the teacher's cognitive and communicative load while simultaneously amplifying student engagement and time-on-task.

3. Student's thinking projector

Mistakes are inevitable and essential part of learning. VerbiNavi works as a student's thinking projector allowing a teacher "to look into student's head" and correct mistakes with high precision.

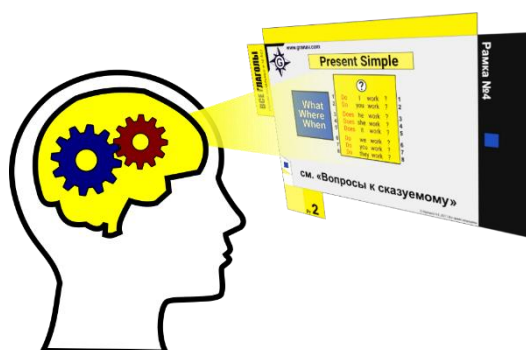


Figure 16. Student's thinking projector.

For instance, a student may fail to apply the third-person singular -s inflection in the Present Simple tense (e.g., "She make tea"). While traditional corrective feedback often proves insufficient—leading to fossilized errors that persist despite intervention—an alternative methodology exists. The teacher directs the student to identify the specific reference card in VerbiNavi required for the construction. Observing the student's selection process provides a window into their metacognitive monitoring and mental models. Inability to locate the correct card suggests a lack of systematic understanding of English tense structures. Active retrieval process

compels the student to engage in pattern recognition and internalize the structural framework of the target language. Iterative practice of this nature facilitates error resolution and ensures long-term linguistic accuracy.

4. Fidget toy effect

The VerbiNavi system aligns with the principles of Multisensory Structured Language Education (MSLE), which posits that language acquisition is enhanced when visual, auditory, and kinesthetic-tactile pathways are activated simultaneously. In the context of neurodiversity—including ADHD and Autism Spectrum Disorder (ASD)—the physical manipulation of colored cards serves as a multisensory anchor. This tactile engagement functions as a sensory-regulatory tool, facilitating the proceduralization of grammatical structures while mitigating the attentional drift common in traditional lecture-based environments. Furthermore, the integration of fine motor coordination within the linguistic task promotes multimodal encoding, which improves long-term retention and instructional efficacy for learners with diverse cognitive profiles.

Conclusion

VerbiNavi represents a significant shift from traditional, label-heavy grammar instruction by transforming the abstract English tense system into a concrete, navigable map. By replacing complex terminology like “Present Continuous” with a numerical, colored and spatial framework, the tool directly addresses the cognitive load challenges identified by Sweller (2016). This “digital remapping” allows beginners to bypass linguistic jargon and move straight to functional communication.

The integration of sentence-building frames provides a physical manifestation of Vygotsky’s (1978) scaffolding, allowing students to operate within their Zone of Proximal Development with high precision. Furthermore, the “fidget toy effect” ensures that the tool is inclusive, providing a multisensory anchor for neurodivergent learners who may struggle with traditional lecture-based environments.

As a “thinking projector,” VerbiNavi does more than teaching—it makes the student’s internal logic visible, allowing for surgical error correction. Future research should explore the long-term transition from this scaffolded navigation to independent, fluid speech, as well as the tool’s adaptability into digital or app-based learning environments.

Summary of Core Features

| Feature | Pedagogical Function | Target Outcome |
|-------------------------------------|------------------------|--|
| 2D Tense Map | Spatial Navigation | Reduces cognitive load |
| Numerical Remapping | Digital Logic | Simplifies tense identification for children/beginners |
| Color-Coded Sets | Visual Distinction | Separates “to be” (pink) from other verbs (yellow) |
| Sentence Frames | Active Scaffolding | Ensures accuracy in basic sentence building |
| Side/Bottom Tabs | Kinesthetic Engagement | Activates multisensory pathways (MSLE) |
| Line Numbering within frame cutouts | Additional Navigation | Supports students who haven’t mastered pronouns |

References

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