

AKADEMIC LYCEUM STUDENTS' DEVELOPMENT OF WEB SITE CREATION SKILLS IN HTML

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Abstrakt. *The thesis investigates pedagogical conditions for developing academic lyceum students' practical website-building skills in HTML. It proposes a competency-based instructional model and evaluates it through design tasks, formative assessment, and iterative feedback. The scientific novelty is an integrated rubric set aligned with project-based learning stages and typical lyceum constraints.*

Keywords. *HTML, website development, academic lyceum, competency-based learning, project-based instruction, formative assessment, digital literacy*

Main body of the thesis. The rapid diffusion of web technologies has transformed how information is produced, validated, and communicated in education and the labor market, making basic web authoring not only a technical skill but also a component of modern digital literacy. For academic lyceum students, learning to create a website in HTML provides a transparent entry point into programming logic, document structure, and user-oriented communication, because HTML offers immediate visual feedback and a clear mapping between code and interface. However, the educational effect of HTML instruction depends less on the mere presentation of tags than on the organization of learning activities that cultivate durable competencies: the ability to plan content, structure documents semantically, test and correct errors, and present results according to usability and accessibility expectations. In this context, the central problem is methodological: how to design instruction so that students' website creation skills develop systematically under typical lyceum constraints such as limited hours, heterogeneous prior preparation, and assessment practices that may favor reproduction over design thinking.

From a didactic perspective, "skill in creating a website in HTML" should be treated as an integrative competency combining knowledge, procedural actions, and reflective regulation. International research on learning programming and computing emphasizes that novices struggle when syntax is taught without meaningful tasks and feedback cycles, while project-based settings improve engagement and transfer when evaluation criteria are transparent and aligned with outcomes [6]. Russian and Uzbek methodological studies similarly underline that informatics education becomes more effective when students work with authentic products, iterate on drafts, and receive structured formative feedback rather than only summative marks [2; 3]. Therefore, the thesis proceeds from the assumption that


the core unit of learning should be a small but complete web artifact, created through successive refinement, and assessed with rubrics that make quality indicators explicit.

The aim of this thesis is to substantiate pedagogical conditions and a competency-based instructional model for developing academic lyceum students' skills of creating websites in HTML, and to determine indicators for evaluating the formation of these skills within a short instructional cycle. The object is the process of teaching web technologies in an academic lyceum; the subject is the methodology of forming HTML-based website creation skills through project tasks and formative assessment. The working hypothesis is that skill development will be more stable and measurable if instruction integrates three conditions: first, semantic orientation of HTML learning (structure-first rather than decoration-first); second, iterative project work with staged deliverables; third, formative assessment supported by analytic rubrics and error-based feedback.

The proposed model includes four logically connected stages that correspond to how novices gradually internalize web authoring actions. At the orientation stage, students analyze examples of simple web pages and identify the function of structural elements such as headings, paragraphs, lists, links, images, and forms. The methodological emphasis is to separate semantic structure from presentation, so that students learn to reason about meaning and hierarchy. This approach responds to the frequent novice misconception that web development is primarily about visual effects; in reality, stable skill begins with the ability to construct a coherent document tree and to choose appropriate tags for content types. The teacher's role at this stage is to guide analysis and to elicit verbal explanations, because articulation of "why this tag fits this content" supports conceptual change and reduces rote imitation [6].

At the design stage, students plan a small website as a system of pages connected by navigation. Planning is operationalized through a simple specification: purpose, target audience, content map, and page structure sketches. The educational value of such planning lies in shifting students from "writing code line by line" to "designing an information product," which is essential for competency-based outcomes. Uzbek pedagogical literature on ICT education stresses that meaningful tasks should be contextually close to students' academic and social experience, because relevance increases persistence and promotes self-regulation [1]. In lyceum conditions, suitable themes include a personal academic portfolio, a subject mini-encyclopedia, or a school club information site, because they encourage content responsibility and allow differentiation by complexity.

At the implementation stage, students construct pages in HTML using a gradual complication principle: first a single-page document with correct structure and validation, then multi-page navigation, then media integration and simple forms. The teacher provides micro-instructions on syntax only as needed, prioritizing debugging strategies: reading error messages, isolating faults, checking nesting and attribute correctness, and validating



markup. Russian methodological sources argue that teaching debugging as a regular practice is decisive for developing independence, because it transforms errors from a source of frustration into a learning resource [2]. In practice, students' difficulties often stem from mismatched tags, broken relative paths, and misunderstanding of block versus inline elements. Addressing these issues requires not only explanation but also targeted exercises where students predict output, locate faults in defective code, and justify corrections, thereby training diagnostic thinking.

At the reflection and presentation stage, students evaluate their websites against explicit criteria and present design decisions. This stage is methodologically important because it connects technical correctness with communicative quality and ethics of information representation. International web standards highlight that semantic markup, clear navigation, and basic accessibility practices improve usability for diverse users [5]. For lyceum students, introducing minimal accessibility criteria, such as meaningful headings, alt text for images, and link clarity, broadens the notion of "quality" beyond appearance. Reflection is organized through peer review guided by rubrics. The rubrics include indicators grouped into structural correctness (valid HTML, semantic tags), functionality (working links, consistent navigation), content quality (clarity, relevance, citation of external media if used), and presentation (readability, minimal accessibility). Such analytic rubrics also serve as a formative tool: students see which dimension needs improvement and can revise accordingly. This alignment between learning activities and assessment criteria is consistent with competency-based evaluation principles and reduces subjectivity in grading [3].

To evaluate effectiveness, the thesis relies on a methodological toolkit combining diagnostic tasks, observation, and product assessment. A pre-instruction diagnostic identifies students' baseline familiarity with file organization, text editors, and basic tags, which allows the teacher to form flexible support groups. During instruction, formative checkpoints are placed at each stage: submission of a site map, submission of a single valid page, submission of a multi-page prototype, and final project defense. Each checkpoint uses the same rubric dimensions but with increasing expectations, enabling growth tracking. Product assessment is complemented by short reflective notes where students describe a difficulty encountered and the strategy used to solve it; this provides evidence of developing metacognitive regulation, which is a key element of sustainable skill.

The scientific novelty of the work is the substantiation of an integrated rubric system synchronized with project stages and adapted to academic lyceum time limits, where each rubric dimension is linked to specific teachable actions and typical errors. Unlike approaches that treat HTML as a set of tags to memorize, the proposed model treats website creation as a cycle of design, implementation, debugging, and communication. The novelty is also expressed in the operational definition of "HTML website creation skill" through



measurable indicators: semantic structuring ability, navigation coherence, correctness and validation, debugging independence, and reflective justification of choices. These indicators can be used for internal monitoring and for aligning lyceum informatics outcomes with broader digital competency frameworks.

The practical significance of the thesis is that it offers a realistic pathway for lyceum teachers to organize instruction without requiring complex infrastructure: a standard computer lab, a text editor, and a browser are sufficient, while optional validators and versioning tools can be introduced gradually. Importantly, the model supports differentiation: students with stronger preparation can extend projects with responsive design elements or embedded multimedia, while beginners can focus on correctness and semantic structure. Such differentiation is pedagogically necessary because heterogeneous groups are typical in lyceum settings and because motivation declines when tasks are either trivially easy or unattainably hard. By anchoring differentiation in the same rubric dimensions, the teacher maintains fairness and transparency.

The results synthesized in this thesis indicate that stable development of website creation skills is achieved when students repeatedly complete the full cycle from planning to presentation and receive targeted feedback aligned with clear criteria. When semantic structure is emphasized early, students demonstrate fewer persistent errors in nesting and page hierarchy; when debugging strategies are taught explicitly, students become less dependent on the teacher; when peer review is guided by rubrics, students' revisions become more purposeful and quality-focused. In conclusion, the competency-based model grounded in project work and formative assessment provides a methodologically justified solution for developing academic lyceum students' HTML website creation skills, ensuring that technical actions are integrated with planning, evaluation, and reflective communication, which together constitute the educational value of introductory web development.

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