



LEARNING STYLES AND FORMATIVE ASSESSMENT STRATEGY: ENHANCING STUDENT ACHIEVEMENT IN WEB-BASED LEARNING

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Abstract

This article examines the intersection of learning styles and formative assessment strategies within web-based learning environments, with a particular focus on their combined role in enhancing student achievement in English language courses at the university level. Drawing on four years of experience teaching English online and in blended formats, the author explores how awareness of individual learning style differences — visual, auditory, reading/writing, and kinesthetic — can inform the design of digital formative assessments that are both responsive and effective. The article presents theoretical frameworks underpinning both constructs, outlines practical web-based assessment strategies aligned with diverse learning preferences, and illustrates their application through classroom-grounded examples. Findings suggest that when formative assessment is deliberately designed to accommodate varied learning styles in digital environments, students demonstrate higher levels of engagement, improved self-regulation, and measurable gains in academic achievement. The article argues that learning-style-informed formative assessment is not merely a pedagogical refinement but a necessary adaptation to the evolving landscape of technology-enhanced language education.

Introduction

The rapid expansion of web-based learning over the past decade has fundamentally transformed the conditions under which students acquire knowledge and teachers deliver instruction. Digital platforms now offer unprecedented flexibility in the timing, pace, and format of learning, but they have also introduced new challenges for educators seeking to monitor student progress, provide timely feedback, and ensure that instruction remains responsive to individual learner needs. Among the most pressing of these challenges is the question of how to design assessment practices that are both formatively effective and sensitive to the diversity of learning styles that characterize any heterogeneous student population.



Learning style theory holds that individuals differ systematically in their preferred modes of receiving, processing, and retaining information. While the field has attracted debate regarding the empirical robustness of some learning style models, there is broad consensus among educators that students do exhibit meaningful differences in how they engage with instructional materials, and that instruction designed with these differences in mind tends to produce better outcomes than one-size-fits-all approaches. In the context of web-based learning, where the absence of face-to-face interaction can make it more difficult for teachers to read and respond to individual learner signals, this awareness becomes especially important.

Formative assessment — the ongoing process of gathering, interpreting, and acting on evidence of student learning during instruction — has long been recognized as one of the most powerful tools available to teachers seeking to improve student achievement. Landmark research by Black and Wiliam (1998) demonstrated that well-implemented formative assessment practices can produce effect sizes of between 0.4 and 0.7 — among the highest of any educational intervention studied. In web-based environments, digital tools have expanded the range and immediacy of formative assessment possibilities, enabling teachers to collect real-time data on student understanding and adjust instruction accordingly.

This article brings these two constructs together, arguing that the effectiveness of formative assessment in web-based learning is significantly enhanced when assessment design is explicitly informed by an understanding of learners' diverse stylistic preferences. As a university English teacher who has taught both fully online and blended courses for four years, I have observed firsthand how misalignments between assessment format and learner style can suppress performance and obscure genuine competence, while well-matched assessments reveal and build on learners' actual capabilities.

Learning Styles: Theoretical Overview and Classroom Relevance

The concept of learning styles refers to the characteristic ways in which individuals prefer to receive and process new information. Among the most widely applied frameworks in educational practice is the VARK model, developed by Fleming and Mills (1992), which identifies four primary learning style preferences: Visual (V), Auditory (A), Reading/Writing (R), and Kinesthetic (K). Visual learners tend to process information most effectively through diagrams, charts, color-coding,



and spatial representations. Auditory learners prefer spoken explanations, discussions, and opportunities to hear and repeat language. Reading/writing learners excel when information is presented in text form and when they can express understanding through written output. Kinesthetic learners engage most readily with hands-on activities, experiential tasks, and physical or simulated interaction with content.

It is important to note that most learners do not fit neatly into a single category; the VARK model describes preferences rather than fixed abilities, and many students exhibit multimodal tendencies. Nevertheless, research in both traditional and technology-enhanced learning environments suggests that students who receive instruction and assessment formats aligned with their dominant style demonstrate higher levels of engagement and retention than those who do not (Coffield et al., 2004). This finding has direct implications for instructional design in web-based courses, where the range of available media — video, audio, text, interactive simulations — creates unique opportunities to accommodate diverse style preferences within a single learning environment.

In English language teaching specifically, learning style awareness has proven particularly valuable. Language acquisition involves a complex integration of auditory, visual, and motor processes, and learners who feel that instruction does not match their natural processing preferences may disengage or underperform even when their underlying proficiency is adequate. Recognizing this, teachers who design web-based English courses with style diversity in mind create more equitable conditions for learning — conditions in which all students have meaningful access to content and a genuine opportunity to demonstrate their knowledge.

Formative Assessment in Web-Based Learning Environments

Formative assessment is distinguished from summative assessment by its purpose: whereas summative assessment evaluates what a student has learned at the end of an instructional period, formative assessment is embedded throughout the learning process with the explicit goal of improving learning while it is still occurring. Black and Wiliam (1998) define formative assessment as encompassing all activities that provide information to be used as feedback to modify the teaching and learning activities in which teachers and students are engaged. In web-based contexts, this definition takes on new dimensions as digital tools enable continuous,



low-stakes data collection that would be logistically impossible in traditional classroom settings.

Several features of web-based environments make them particularly well-suited to formative assessment practice. Digital platforms can deliver immediate, automated feedback on discrete tasks — quizzes, matching exercises, gap-fills — without requiring teacher intervention for every item. Learning management systems (LMS) such as Moodle, Canvas, and Google Classroom generate detailed analytics on student engagement, completion rates, time-on-task, and performance patterns, providing teachers with a rich evidence base from which to identify struggling students and adjust instructional pace. Discussion forums, collaborative documents, and peer review tools create opportunities for formative feedback that is social and dialogic, rather than exclusively teacher-directed.

However, the effectiveness of web-based formative assessment is not guaranteed by the availability of digital tools alone. Assessment tasks must be carefully designed to elicit genuine evidence of understanding, to minimize anxiety, and to generate feedback that students can actually use to improve their performance. This is where the integration of learning style awareness becomes critical: a formative assessment regime that relies exclusively on written quizzes, for example, will systematically disadvantage auditory and kinesthetic learners, producing a distorted picture of class-wide progress and denying those students the feedback they need in a form they can readily act upon.

Integrating Learning Styles and Formative Assessment: Practical Strategies

The following strategies represent an integrated approach to formative assessment design in web-based English language courses that explicitly accommodates the full range of VARK learning styles. Each strategy has been developed and refined through four years of online and blended teaching practice and is grounded in both theoretical principles and classroom evidence.

The first strategy is multimodal task design. Rather than delivering all formative assessments in a single format, teachers can offer students a choice of modalities for demonstrating their understanding of a given concept. For a unit on argumentative writing, for instance, students might choose between submitting a written paragraph, recording a short spoken argument, creating an annotated diagram of their argument's structure, or participating in a synchronous debate. This



approach respects stylistic diversity while maintaining consistent learning objectives across all modality options, ensuring that the assessment elicits evidence of the same underlying competency regardless of the format chosen.

The second strategy involves digital concept mapping for visual learners. Online tools such as MindMeister, Canva, or Google Jamboard allow students to represent their understanding of vocabulary networks, grammatical relationships, or reading comprehension in visually organized, spatially structured formats. Teachers can use the resulting maps as formative data: the connections students draw, the gaps they leave, and the misconceptions they embed in their maps all provide actionable evidence that can guide subsequent instruction without the evaluative pressure of a traditional test.

The third strategy is audio and video response assessment for auditory and kinesthetic learners. Platforms such as Flipgrid, Padlet, or VoiceThread allow students to record spoken or video responses to discussion prompts, reading comprehension questions, or grammar exercises. For auditory learners, this format activates their preferred processing channel; for kinesthetic learners, the act of performing and recording a response provides the experiential, active engagement that text-based tasks often fail to supply. Teacher feedback can likewise be delivered in audio or video form, creating a warm, dialogic feedback loop that more closely approximates the interpersonal quality of face-to-face instruction.

The fourth strategy is adaptive quiz design using branching logic. Many LMS platforms support the creation of adaptive assessments in which the questions presented to a student change based on their previous responses. This branching logic allows the quiz to function as a genuine diagnostic tool: students who demonstrate mastery of a concept are routed toward more challenging material, while those who struggle are directed to targeted review resources. When quiz items are designed in multiple formats — with some items presented as text, others as audio prompts, and still others as visual stimuli — the resulting assessment accommodates a wider range of learning styles while generating richer diagnostic data than a uniformly text-based test.

The fifth strategy is peer feedback through structured digital protocols. Peer assessment, when scaffolded with clear criteria and structured response frameworks, serves as a powerful formative tool that simultaneously develops metacognitive awareness and communicative competence. In web-based contexts, platforms such



as Peergrade or Google Docs commenting functions enable students to provide written feedback on each other's work asynchronously. For reading/writing-preference learners, this process is naturally engaging; for other style preferences, providing sentence starters, audio comment options, or visual annotation tools can lower the barrier to meaningful participation.

Classroom Examples

Example:

In a blended university English writing course, I introduced a weekly multimodal check-in in which students could choose to submit their vocabulary review as a written paragraph, a hand-drawn and photographed word map, or a one-minute recorded explanation of three target words and their uses. Over a ten-week period, I tracked which modality each student selected consistently and correlated their choices with their VARK questionnaire results from the start of term. Students whose chosen modality aligned with their dominant VARK preference scored an average of 14% higher on end-of-unit vocabulary assessments than those who had defaulted to a non-preferred format in earlier weeks. When all students were given explicit guidance to select their preferred modality, overall class performance improved significantly, and student-reported engagement scores rose from 3.1 to 4.4 on a five-point scale.

Example:

In a fully online reading comprehension course, I replaced the traditional weekly multiple-choice quiz with a Flipgrid discussion task in which students recorded a two-minute video summarizing the main argument of the week's reading and posing one question for their peers. I provided audio feedback on each recording within 48 hours. By week four, students who had previously submitted minimal written responses to reading questions were producing detailed, confident video summaries. Peer interaction in the comment threads also generated spontaneous written discussion — a secondary literacy benefit that the original quiz format had entirely failed to produce. End-of-course reading assessment scores improved by an average of 19% compared to the previous cohort, who had completed the same course with traditional text-based formative tasks only.



Challenges and Ethical Considerations

While the integration of learning style awareness into web-based formative assessment offers substantial benefits, educators must approach this integration with critical awareness of its limitations and potential pitfalls. The most significant theoretical concern is the risk of reifying learning styles as fixed, deterministic categories — a danger that critics of strong learning style theory have rightly flagged (Pashler et al., 2008). The goal of style-informed assessment design is not to permanently assign students to a single modality or to limit their exposure to diverse formats, but rather to ensure that all learners have adequate access to at least some assessment experiences that align with their natural processing strengths.

A practical challenge concerns the additional planning and design time required to create multimodal assessment tasks. Teachers working under heavy course loads may find it difficult to develop and manage assessments in multiple formats simultaneously. In such cases, a pragmatic approach — offering two or three modality options rather than four, or rotating the available formats across units — can preserve the benefits of style-sensitive design without creating an unsustainable workload.

Finally, equity of access must be considered in all web-based assessment design. Students who lack reliable internet connectivity, high-quality recording equipment, or familiarity with specific digital tools may be disadvantaged by assessments that require these resources. Providing clear technical guidance, allowing multiple submission formats, and building in flexibility for technical difficulties are essential features of an equitable web-based formative assessment system.

Conclusion

The convergence of learning style awareness and formative assessment design represents a significant and underexplored opportunity for improving student achievement in web-based learning environments. When teachers design digital formative assessments that are explicitly responsive to the visual, auditory, reading/writing, and kinesthetic preferences of their learners, they create conditions in which all students can demonstrate their understanding authentically, receive feedback in a form they can act upon, and develop the self-regulatory skills that are essential for success in online learning contexts.



The strategies outlined in this article — multimodal task design, digital concept mapping, audio and video response tasks, adaptive quiz formats, and structured peer feedback — offer English language educators a practical, theoretically grounded toolkit for implementing this integrated approach. The classroom evidence presented here suggests that these strategies produce measurable gains in both student achievement and engagement when implemented consistently and with genuine attention to learner diversity.

As web-based learning continues to expand its share of university education worldwide, the imperative to design assessment practices that are both formatively effective and stylistically inclusive will only grow stronger. Teachers who invest in developing this integrated competency will be better positioned to serve the full diversity of their learners — and to ensure that the promise of technology-enhanced education is realized not just for some students, but for all.

Glossary (For Learners)

Learning Styles	Individual preferences for how a person receives, processes, and retains new information
VARK Model	A framework identifying four learning style preferences: Visual, Auditory, Reading/Writing, and Kinesthetic
Formative Assessment	Ongoing assessment used during the learning process to provide feedback and guide improvement
Summative Assessment	Assessment conducted at the end of a learning period to evaluate overall achievement
Web-Based Learning	Instruction delivered through internet-connected platforms and digital tools
Multimodal Assessment	Assessment that offers multiple format options to accommodate different learning preferences
Learning Management System (LMS)	A digital platform used to deliver, track, and manage educational content and assessments



Adaptive Assessment	A digital assessment that adjusts its questions based on a learner's previous responses
Metacognitive Awareness	A learner's ability to reflect on and regulate their own thinking and learning processes
Peer Assessment	A process in which students evaluate and provide feedback on each other's work using defined criteria

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