

System Composition and Design Specifications of Digital Language Laboratories

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Abstract Equipped with Digital Innovation, The Digital Language Laboratory serves as a creative educational tool for teaching foreign languages and changes the traditional teacher-centered setting. According to constructivist educational ideas and theories about the acquisition of second language, this paper adds two basic elements: instruction characteristics and administrative Management functions; And network-connected high-interactive and flexible Multimedia Systems are featured. Based on the system architecture view, this paper sets up requirements for the initial design of the window manipulation operation interface refinement to establish a Technical specification basis that aligns with educational objectives. These regulations set out a standard for how to effectively use such equipment; address the special circumstances of learning English internationally; ensure smooth operation of the learner-centred teaching mode and finally improve the quality and efficiency of instruction.

Keywords: Electronic Systems; Digital Speech Studio; Structural Framework; Instructional Materials; Educational Protocols

The instruction Delivery Mechanism of foreign language Education covers: computer-Managed Language Repetition, which provides acoustic difference and articulation improvement; Audio-On-Demand (AOD), Video-on-demand (VOD); Text Retrieval For Self-study, including adjustable Speed rate And Caption selection functions; Terminal Projection Frameworks With Multi-screens Interaction ability ; Participatory Feedback Tools. These parts form a whole foreign-language teaching environment which can simultaneously and after some time educate students. Each procedure runs concurrently through algorithm design to create a human-machine interaction system among teachers and students that acts as an intermediary platform for sharing data and media. Following the behaviourist educational principle, it introduces some features of programme-determined questions, self-organisation material repetitions for mistake correction, stochastic tests to strengthen memory consolidation, and collaborative and shared educational materials to foster cooperative cognitive abilities[Huang 2022:47]. In addition, The portable devices can provide a certain degree of socialising with classmates through real-time voice and picture communication; At the same time, it contributes to the development of students' ability to speak.

Vivid digital multimedia materials in language teaching have strong aesthetics; they can motivate the learning interest of students effectively according to self-determination theory; They emphasise important course concepts; And transform abstract linguistic knowledge into visible auditory-visual experiences that helps overcome pedagogical issues. According to the development philosophy of windows management in line with the cognitive load theory, interface design improve utility based on optimisation, be strictly compliant with technical standards such as video resolutions $\geq 1080P$ and sound files sampled at ≥ 44.1 kHz to guarantee uninterrupted playback effects when used. All these factors together make the Curriculum more suitable as both a teaching reference tool in theory and an application ground in practice.

Based on Sweller's theory of cognitive load, the administrative Interface should be simple so as not to add more cognition; It will make teachers use it better. It must be avoided to deal with the complexity of multi-window Management and present relevant teaching functions uniformly (such as playback control, Group Segmentation, evaluation launch), etc. A control panel could be placed above the work area, or hidden in a drop-down menu to avoid being blocked by teaching materials when using videos frequently. At the same time, provide context-aware digital assistance (such as displaying modal prompts for complex operations and providing teaching videos after tapping), improving the precision of instructors' actions, reducing the cost of adoption for new users, alleviating their worries about operation, etc. Also design in keeping with generally followed Design Guidelines concerning the presentation of Graphics; Adjust its Text Size within tolerable Error Bounds.

Each instruction module should have an independently clear teaching goal (e.g., mastery of vocabulary, comprehension of listening content, skill training), thereby promoting cooperative learning and integration to ensure the coherence of the overall education plan. Based on the level organisation in syllabus development, all elements at different grade levels should be included progressively; current proficiency serves as a basis for its extension. Technical obstacles in the process of visualisation or implementation (e.g., internet delay or hardware failure) can be supported by various functional modules together to compensate for each other's shortcomings; For example, a decoupled streaming function can replace real-time transmission when it fails[Zhong 2025:33]. Moreover, it needs to allow users to switch between different teaching forms flexibly enough (such as teacher demonstration instructions, independent practice by students, group discussions), which helps meet changes in classrooms at any time and improve learning outcomes.

References

1.Huang J., Nie L. Deployment and Application of Virtual Simulation Environment of Cloud

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Digital Language Laboratory // Modern Computer (Professional Edition). 2022. № 11. P. 42-50.

2.Zhong X. Exploring the path to building intelligent language laboratories in the era of digital intelligence // Journal of Computer Science and Frontier Technologies. 2025. Vol.8. P. 29-41.