

Approaching the PDCA Cycle in Managing Local Educational Activities at the Primary Level According to the Digital School Model in Vietnam

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Abstract: Implementing local educational content in accordance with the 2018 General Education Program plays a fundamental role in shaping the cultural identity of primary school students in Vietnam. However, traditional management methods are revealing many bottlenecks regarding cost, space, and resource shortages. This article focuses on analysing and proposing a model for local education management based on the PDCA cycle (Plan - Do - Check - Act) operating entirely within a digital school ecosystem. By integrating a learning management system (LMS), open educational resources (OER), and data analytics tools, the study establishes a synchronised theoretical framework, helping to shift management from qualitative to data-driven. This model offers a feasible approach to creating a flexible learning environment, contributing to the simultaneous development of cultural pride and digital competence among students.

Keywords: Local education management; Digital school model; PDCA cycle; Primary education; Digital transformation.

1. Introduction

The implementation of the 2018 General Education Program in Vietnam (replacing the old 2006 general education program) has made local education content compulsory, playing a core role in fostering cultural identity and a sense of origin in primary school students (Ministry of Education and Training, 2018). Simultaneously, the national digital transformation orientation is comprehensively restructuring the operational methods of educational institutions (Prime Minister, 2020). The intersection of these two trends creates an urgent need: to build an effective mechanism for managing local education based on the digital school model.

However, in practice, management methods in the physical school environment are revealing many bottlenecks. Educational institutions face a lack of standardised materials, significant cost barriers when organising field experiences, and limitations of traditional assessment methods (Tran Thi Huong & Nguyen Tien Hung, 2021). Furthermore, management is primarily based on qualitative experience and lacks micro-measurement tools, increasing the risk that the implementation of foundational education content becomes merely a formality (Pham Quang Huan, 2022).

Accessing the vast body of academic literature, previous studies have partially addressed the issue in three aspects: (1) Guiding the integration of local themes into subjects (Nguyen Thi Kim Dung, 2020); (2) Establishing a theory of smart school management (Le Ngoc Hung, 2021); and (3) Applying virtual reality technology to heritage teaching (Nguyen Huu Dung, 2022). However, the existing academic landscape remains fragmented, lacking a synchronised governance framework operating seamlessly in the digital environment. In response to this theoretical gap, this study aims to establish a specialised theoretical framework and propose a model for local education management based on the PDCA cycle, providing scientific arguments to address practical bottlenecks in primary schools.

2. Content

2.1 Research Methodology

The research employs specialised theoretical methods to construct a solid theoretical framework. The method of document and text analysis helps establish the legal basis and accurately define the core foundation of the research subject. The method of theoretical analysis and synthesis is used to identify concepts and components of academic content. The method of theoretical classification and systematisation plays a role in structuring multidimensional knowledge into a tightly structured, hierarchical, logical whole. The method of generalisation is used to distil the essence of laws from disparate practical phenomena, elevating them to scientific arguments that affirm the objective necessity of transforming the school governance system.

2.2 The concept of managing local education activities according to the digital school model

Local education based on the digital school model is the process of organising, implementing, and managing educational activities with local specificities (history, culture, geography, socio-economics) on the school's integrated technological ecosystem. This process maximises the power of big data, artificial intelligence, and virtual reality technologies to transform local knowledge into interactive digital resources, creating a flexible, barrier-free learning environment that helps learners deepen their understanding of their roots while simultaneously building adaptability in the digital age.

The essence of this concept lies in the intersection of physical space (traditional classrooms, field sites) and cyberspace (learning management systems, virtual museums), thereby establishing an open, continuous, and personalised educational mechanism.

2.3 Characteristics of local education management according to the digital school model

Unlike traditional educational methods, this model exhibits systematic academic characteristics and offers significant advantages.

a) The boundless nature of space and time

Digital technology breaks down the physical boundaries of the traditional classroom. Students no longer need to travel to historical sites or traditional craft villages to observe. Through virtual reality (VR/AR) technology and digital exhibition spaces, learners are immersed in authentic local cultural environments at any time. This shift optimises the cost of organising extracurricular activities while still ensuring the depth of the learning experience.

b) The dynamic structure of the biomaterial ecosystem

In the traditional model, local educational materials are often static and slow to update. Under the digital model, local learning materials exist as an open educational resource (OER) ecosystem. Data on the local economy, society, and environment are updated in real time. Teachers and even students have the right to participate in contributing, editing, and enriching the shared learning resource repository through a cloud platform.

c) Personalisation based on learning data analysis

The Learning Management System (LMS) integrates micro-measurement tools to track every student interaction with local cultural and historical topics. The extracted data allows algorithms to identify each individual's level of interest and learning ability. Based on this database, the system suggests learning pathways and provides practical research projects tailored to each student's intellectual aptitude.

d) Network properties and co-construction

The educational process is no longer a linear relationship between teacher and student. Digital platforms connect multiple stakeholders: schools, families, cultural experts, folk artists, and local social organisations. The community becomes co-creators of the curriculum, directly participating in interactions and sharing experiences online with the younger generation.

2.4 Objectives of local education activities at the primary school level

Based on the 2018 General Education Program (issued with Circular No. 32/2018/TT-BGDĐT) and the direct professional guidance documents of the Ministry of Education and Training, and Official Letter No. 3536/BGDĐT-GDTH of 2019 on the compilation, appraisal, and implementation of local education content at the primary school level, the objectives and content of local education at the primary school level are systematically and scientifically structured as follows:

In terms of awareness: Equip primary school students with a basic, intuitive, and manageable understanding of the cultural, historical, geographical, economic, social, and environmental values of the province/city where they live. This process complements the local specificity of the national general education curriculum, making knowledge more accessible and highly applicable.

Regarding character development, local education plays a leading role in fostering love for one's homeland and country. Through its core values, the education system instils in students national pride and an appreciation for cultural heritage, while strengthening essential qualities such as patriotism, compassion, diligence, honesty, and responsibility.

Regarding competencies: Promoting the ability to apply knowledge to local practices. The central goal is to develop the capacity to understand nature and society and to adapt to the living environment. Students will begin to develop awareness of how to participate in solving micro-level problems in the community (such as environmental protection and landscape preservation), creating a foundation for future career orientation.

2.5 Local education content in primary schools

Regarding the program's implementation, at the primary school level, local education is not designed as a separate subject. This content is structured to be organically integrated into experiential activities and incorporated into other subjects (Vietnamese Language, Ethics, Natural and Social Sciences, Mathematics, History, and Geography). The framework for local education content at the primary school level is divided into three basic knowledge pillars:

History, Tradition, and Culture: An outline of the history of formation, development, and fine traditions of our homeland. Identify and learn about the system of historical sites, museums, and cultural figures associated with the local area. Explore traditional art forms, intangible cultural heritage, customs, practices, and typical folk festivals.

Geography, Environment, and Natural Landscape: Survey of basic features of administrative geography, natural conditions, and characteristics of the indigenous population. Explore the natural landscapes and scenic attractions characteristic of the region. Educating people about the current state of the local natural environment, raising awareness of biodiversity conservation, and promoting actions to address climate change in their living spaces.

Economy, Society, and Lifestyle Education: Introducing traditional occupations, craft villages, and some characteristic economic activities and labour markets at the local level. Learn about basic social security policy issues and community-oriented charitable activities. Building a civilised lifestyle, promoting cultured behaviour, providing life skills education, and fostering respect for law and order within the community.

From a school management perspective, implementing these contents requires the school administration to direct the teaching staff to be flexible and creative in selecting topics, ensuring they are appropriate, not overwhelming, and closely linked to the practical experiences of elementary school students.

2.6 How to implement local education activities in primary schools

The blended learning approach is interdisciplinary. Teachers proactively transform local knowledge into topics integrated into core subjects. By establishing a series of tasks on a learning management system (LMS), teachers guide students to independently research their heritage and local geography online, creating a data foundation for debates and problem-solving directly in the physical classroom.

Virtual field experiences through simulation technology. To break down geographical barriers and reduce extracurricular costs, teachers use open educational resources (OER) alongside virtual reality (VR) and 3D exhibitions. This pedagogical approach allows teachers to organise online field trips, bringing the local ecological and historical context into the classroom and directly meeting the vivid visual learning needs of elementary school children.

Project-based learning connects communities. Teachers shift their role from mere transmitters of information to facilitators of digital learning projects. Through online platforms, teachers organise real-time interactive classes with local artisans and cultural researchers. Simultaneously, teachers guide students in digitising their learning outcomes into multimedia products, directly contributing to and enriching shared local learning resources.

2.7 The PDCA cycle in local education management at the primary school level according to the digital school model

The PDCA (Plan–Do–Check–Act) cycle approach, a cyclical quality management model, emphasises “continuous improvement” in all organisational activities and is applied to the management of local education at the school level using the digital school model. Specifically, as follows:

2.7.1 Strategic Design and Planning (Plan)

Institutionalising local educational content within school curricula requires the organic integration of local cultural, historical, and geographical themes into school educational plans through a digital management system. The school administration and professional council need to define learning outcomes, establish

integration spaces and timelines that are appropriate to the psychophysiological characteristics of primary school students, and aim for the holistic development of learners' qualities and competencies.

Entrust specialised organisations with the task of collecting, translating, and digitising local resources through a rigorous vetting process. Personnel responsibilities in this process must strictly adhere to the principles of clear personnel, tasks, objectives, standards, resources, and outputs.

Synchronising educational technology infrastructure is crucial. Educational institutions need to ensure standardised classroom systems with smart terminals and broadband network infrastructure. This is a mandatory physical prerequisite for creating an interactive and visually engaging learning environment, supporting the maximum utilisation of communication technology within the classroom.

2.7.2 Implementation of the Education Plan and Technology Integration (Do)

The principal directed the subject departments and teaching staff to utilise multimedia design and editing tools to transform local knowledge into e-learning lectures and interactive learning materials. The application of advanced technologies such as virtual reality (VR) or augmented reality (AR) is considered a groundbreaking pedagogical solution, helping to break the boundaries of physical space and allowing primary school students to access the context of cultural heritage in the most authentic and vivid way possible, digitising and developing learning resources.

Directing the organisation of blended learning. This method establishes a connection between the traditional learning space and the online learning management system (LMS). Teachers guide the learning process through tasks and electronic worksheets, promoting students' ability to construct knowledge independently at home with family support, before organising in-depth knowledge-building activities in the classroom.

Regular professional development activities for teachers and subject heads should focus on enhancing digital pedagogical skills. Core content includes the ability to design educational graphics, methods for using open educational resources (OER), and an understanding of intellectual property rights in cyberspace when accessing local resources. Developing digital capabilities for the teaching staff is crucial.

2.7.3 Verification, Measurement and Evaluation (Check)

Innovate methods for assessing learning outcomes. Schools need to leverage real-time interactive educational technology platforms to design tools for measuring student competence. Gamification in assessment is not only suitable for understanding the psychology of primary school children but also provides a micro-database that automates the immediate quantitative analysis of educational results.

Monitoring the process through learning analytics. Administrators and teachers use measurement reports from the LMS to track progress, engagement, and effectiveness in implementing local learning projects for individual or group students.

Quality assurance of digital learning materials. The school's scientific council must evaluate digital products designed by teachers. The evaluation criteria must adhere to principles of scientific accuracy, pedagogical soundness, aesthetic appeal, and compatibility with local culture.

2.7.4 Adjustment and Sustainable Development (Act)

Adjusting and restructuring learning materials. Based on the results extracted from digital learning data, teachers conduct an analysis and critique to refine teaching methods. This process is accompanied by updates and redesigns of local learning modules to increase their attractiveness and better meet the diverse cognitive needs of learners.

The school administration is responsible for directing the transfer of verified local educational resources to the management agency's electronic portal or shared data repository. This activity aims to disseminate knowledge values, build a broad pedagogical network connecting with the community and educational institutions in the same area, and create a knowledge-sharing community.

The primary school principal uses data from the evaluation cycle to diagnose bottlenecks throughout the entire system. Based on the diagnostic results, the principal makes strategic decisions regarding upgrading technological infrastructure, reallocating budget and human resources, ensuring synchronised operations, and enhancing the school's educational capacity in subsequent school years. This refines the school's governance strategy.

2.7.5 Conditions for implementing the local education management cycle in primary schools according to the digital school model.

For this system to function effectively, educational institutions need to meet stringent institutional requirements across four core areas.

The school administration must establish a strategic vision and institutionalise the digital transformation of local educational resources through internal regulations. This process requires clear regulations on intellectual property rights for digital lessons, standards for student data security, and financial mechanisms to maintain and upgrade software and hardware systems specifically for local subjects.

Schools must create a smart educational environment with a server-based storage system (or cloud computing) with sufficient capacity to handle heavy multimedia learning materials (4K videos, 3D models). A high-bandwidth internet network and end-user devices (interactive TVs, tablets) must be uniformly equipped in every classroom to ensure no delays in the transmission of knowledge.

Teachers serve as educational design engineers. The team needs to master the Technology-Pedagogy-Content Competency Framework (TPACK). Specifically, teachers must not only have a deep understanding of local knowledge but also be proficient in educational graphic design, flip-room classroom management, and coordinating online learning projects on an LMS.

The assessment of learning outcomes in local content should not be rigidly based on traditional examinations. The system must integrate diverse electronic assessment tools, such as digital learning portfolios (e-portfolios), gamification, and assessment of students' digital project products (such as videos telling historical stories or posters for local tourism). This mechanism ensures objectivity and continuity, and accurately reflects learners' ability to apply local knowledge in practice.

3. Conclusion

The shift from traditional administrative management methods to a digital school model in local primary education is not merely a process of computerising documents, but a profound paradigm shift in governance. Through a data-driven PDCA cycle approach, an open education management ecosystem addresses bottlenecks related to spatial barriers and assessment rigidity. The integration of online learning management systems (LMS), open educational resources (OER), and virtual reality (VR/AR) technologies shapes a flexible and personalised educational environment while maximising community participation and co-creation.

This research addresses the theoretical gap in smart school management and provides scientific arguments to help school administrators successfully implement the 2018 General Education Program. This management model aims to build a foundation of " *dual competencies* " for primary school students, fostering pride in their heritage while developing digital skills for flexible adaptation and deep integration into the digital age.

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