An Exploratory Study of Weaknesses in Nepal's Grade 10 Computer Science Curriculum from a Student Perspective.

Samriddha Jung Pande

A Levels Student, St. Xavier's College Loyola Campus, Maitighar

Correspondence Email: samriddhajungpande@gmail.com

Abstract:

This exploratory qualitative study examines perceived weaknesses in Nepal's Grade 10 Computer Science curriculum based on student and teacher experiences. Drawing on survey responses and semi-structured interviews with students who recently completed the curriculum and educators involved in its delivery, the study identifies recurring concerns related to limited development of critical thinking and problem-solving skills, low retention of core concepts, examination-oriented teaching practices, unreliable practical assessment, and frequent errors in prescribed textbooks. Rather than assessing curriculum failure objectively, the research focuses on how learners and teachers experience and interpret the curriculum in practice.

Findings suggest that instructional and assessment practices emphasize rote memorization over logical reasoning and practical application, leading to short-term examination success but weak conceptual understanding. Participants also reported inconsistencies in teaching quality and limited accountability in internal practical assessments. When cautiously compared with themes emphasized in international computer science education literature—such as project-based learning, computational thinking, and continuous skill progression—the Nepali curriculum appears misaligned with several widely accepted educational goals. The study concludes by recommending targeted curriculum reform, improved teacher training and accountability mechanisms, enhanced textbook quality control, and more reliable assessment

practices. While limited in scope, this research contributes student-centered insights to ongoing discussions on improving secondary-level computer science education in Nepal.

Introduction:

Computer Science is widely understood as a discipline grounded in logical reasoning, problem-solving, and critical thinking. Beyond technical knowledge, effective computer science education aims to cultivate analytical skills that enable learners to design solutions, evaluate efficiency, and adapt to rapidly evolving technologies. As a result, secondary-level curricula play a crucial role in shaping students' foundational understanding and attitudes toward the subject.

In Nepal, Computer Science has been introduced at the secondary level with the stated intention of equipping students with basic computational knowledge and digital literacy. Previous research on information and communication technology (ICT) education in Nepal has highlighted several structural challenges, including limited curricular flexibility, inadequate emphasis on hands-on learning, uneven distribution of content difficulty, and insufficient teacher support mechanisms. Scholars have also emphasized the need for curriculum customization based on school infrastructure and the importance of teacher training and instructional guides for effective implementation.

However, existing studies have largely focused on institutional and teacher-centric perspectives, often overlooking student experiences of learning, retention, and application. Moreover, limited attention has been given to concerns such as the accuracy of prescribed textbooks, the reliability of practical assessments, and the extent to which curricular promises of regular updates and skill development are realized in practice.

This study seeks to address these gaps by examining the Grade 10 Computer Science curriculum from a student-centered perspective, supplemented by teacher insights. By focusing on lived experiences rather than measurable performance outcomes, the research aims to identify perceived weaknesses in curriculum design, instruction, and assessment. The study also situates these findings within broader international discussions on computer science education, not to claim equivalence or direct comparison, but to contextualize observed issues against commonly cited global educational principles.

Methodology:

2.1 Research Design

Given the exploratory nature of the research and the author's position as a student researcher, this study adopted an **exploratory qualitative case-study approach**. This design is appropriate for examining perceptions, experiences, and systemic issues within a specific educational context rather than producing statistically generalizable findings.

2.2 Participants and Data Collection

Data were collected from a purposive sample of **25 participants**, including:

- Grade 11 students who had recently completed the Grade 10 Computer Science curriculum, and

- Teachers and professionals with experience teaching or contributing to the curriculum.

Participants were drawn primarily from urban and semi-urban schools with varying levels of institutional resources. Data collection methods included:

- structured questionnaires with open-ended responses, and
- semi-structured interviews allowing participants to elaborate on their experiences.

All participants provided informed consent, and responses were anonymized. Data were used exclusively for academic research purposes.

2.3 Focus Areas

The study focused on four primary themes:

1. Teacher preparedness and instructional practices
2. Reliability and relevance of prescribed textbooks
3. Development of critical thinking and problem-solving skills
4. Assessment practices and curriculum modernization

2.4 Data Analysis

A thematic analysis was conducted to identify recurring patterns, shared concerns, and majority trends across responses. Emphasis was placed on consistency across participant experiences rather than isolated incidents.

2.5 Limitations

This study has several limitations:

- a small sample size,
- an urban bias in participant selection, and
- reliance on self-reported experiences rather than direct classroom observation.

These limitations restrict generalizability but do not diminish the study's value as an exploratory, context-specific inquiry.

Results:

The analysis revealed several recurring themes related to curriculum effectiveness, instruction, and assessment. Table 1 summarizes the key findings.

Table 1: Summary of Key Findings from Participant Responses

Identified Issues	**Description Based on Participant Experiences**
Low retention of content	Most students recalled only chapter titles rather than conceptual understanding; programming syntax and number systems were frequently forgotten within a year.
Limited logic building	Instruction was perceived as focused on examination-specific questions rather than problem-solving or algorithmic thinking.
Examination difficulty mismatch	Internal assessments were viewed as more challenging than national board examinations, which participants felt emphasized basic recall.
Question redundancy	Analysis of recent examination papers suggested limited variation and low cognitive demand in theory questions.
Textbook inaccuracies	All participants reported grammatical, conceptual, or syntax-related errors in prescribed textbooks.
Unreliable practical assessment	Many students reported receiving high practical marks despite minimal or incomplete practical engagement.
Teacher engagement variability	Teaching quality varied widely, with only a minority of schools reported to encourage deeper conceptual learning.

4. Discussion

The findings indicate a perceived misalignment between the intended goals of the Grade 10 Computer Science curriculum and students' actual learning experiences. Consistent with theories of rote learning, participants described instructional practices that prioritize memorization and repetition over conceptual understanding and application. This approach appears to contribute to poor long-term retention and limited transfer of skills to higher-level studies.

Concerns regarding assessment validity—particularly the reliability of practical marks—raise questions about whether current evaluation mechanisms accurately reflect student competence. When practical components lack transparency or accountability, the incentive to engage meaningfully with hands-on learning diminishes, undermining key objectives of computer science education.

Variability in teacher engagement further compounds these issues. While some participants reported exposure to enriched instruction informed by international curricula, such experiences were limited to a small number of well-resourced institutions. This inconsistency suggests systemic challenges in teacher training and professional development rather than isolated instructional shortcomings.

When cautiously situated within international computer science education literature, these findings echo broader concerns about curriculum alignment, skill progression, and assessment integrity in developing education systems. However, this study does not claim direct equivalence or comparative rigor; instead, it highlights areas where participant experiences diverge from commonly cited educational best practices.

5. Recommendations

To address the identified weaknesses, the following actionable reforms are proposed.

Table 2: Recommended Reforms Based on Identified Weaknesses

Identified Weakness	Suggested Reform	Responsible Body
Emphasis on rote memorization	Introduce project-based and problem-solving assessments	Curriculum Development Centre
Weak practical assessment integrity	Implement centralized or externally moderated practical examinations	Examination Board
Teacher quality variability	Require mandatory certification and continuous professional development for CS teachers	Ministry of Education
Textbook inaccuracies	Establish peer-review and technical validation processes for textbooks	Ministry of Education
Outdated or static content	Introduce biennial curriculum reviews and updates	Curriculum Development Centre

Conclusion: This exploratory study has highlighted several perceived weaknesses in Nepal's Grade 10 Computer Science curriculum from the perspective of students and educators. Findings suggest that current instructional and assessment practices prioritize short-term examination performance over critical thinking, logical reasoning, and practical competence. While some institutions demonstrate effective teaching practices, these remain the exception rather than the norm.

Policy-level constraints, including concerns over pass rates and shortages of qualified teachers, appear to contribute to the persistence of these issues. Without targeted reform, students may continue to achieve high examination scores while remaining underprepared for advanced studies and real-world technological challenges.

Although limited in scope, this study contributes valuable student-centered insights to discussions on curriculum reform. By strengthening practical learning, improving assessment reliability, supporting teacher development, and aligning curricular goals with widely accepted educational principles, Nepal can enhance the effectiveness of its secondary-level computer science education and better prepare students for participation in an increasingly digital world.

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