Enhancing Student Mastery in Visual Basic Programming through 'VB Pocket': A CQI Implementation in Malaysian Polytechnic

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Abstract
This study explores the implementation of a Continuous Quality Improvement (CQI) initiative in the DFP40233 Visual Basic Programming course at Politeknik Balik Pulau. The intervention was driven by declining student performance in applying Visual Basic.NET concepts, prompting the development of VB Pocket, a mobile learning application, alongside an integrated eBook. Post-intervention results, as evaluated through the Course Outcome Review Report (CORR) for Session II 2024/2025, revealed significant improvement in students' conceptual mastery, engagement, and practical problem-solving abilities. This paper outlines the pedagogical transformation and advocates the integration of mobile-first learning strategies in technical education.
Keywords: Visual Basic.NET, mobile learning, CQI, Flipped Classroom, Technical Education, Vb Pocket, Digital Pedagogy

Introduction
Teaching programming effectively has always been a challenge, especially for beginner-level students in technical and vocational institutions. In Malaysian polytechnics, Visual Basic.NET is a core component of many diploma programs, yet students often face difficulties applying programming concepts in practical tasks. This problem is especially evident in courses like DFP40233, where topics such as control structures, debugging, and data handling require a solid understanding of both theory and application.

Over the past few semesters at Politeknik Balik Pulau, performance data showed a concerning trend: many students were unable to achieve expected outcomes, particularly in applying their knowledge to build functioning applications. This raised questions about the effectiveness of current teaching methods and the level of student engagement. Therefore, there was a real need to explore new ways to support learning, especially methods that are more accessible, flexible, and student-friendly.

This study is important because it responds directly to that need. By introducing VB Pocket, a mobile application aligned with the course syllabus, and integrating it with a Visual Basic.NET eBook, the study aims to provide a more engaging and independent learning experience. The

goal is not only to help students improve their programming skills but also to encourage them to take ownership of their learning.

The study is especially beneficial for diploma students who may struggle with traditional lecture formats, as well as educators looking for practical tools to enhance their teaching. It also supports institutional efforts to modernise teaching practices through the use of digital tools. Overall, this research highlights the value of combining mobile learning with existing course materials to improve student outcomes and support continuous improvement in teaching.

Digital transformation in education has revolutionised pedagogical delivery, especially in programming courses where theory-practice integration is critical (Alrasheedi et al., 2015). In Malaysian polytechnics, students often encounter difficulties in translating abstract programming logic into functioning applications using Visual Basic.NET (Zakaria & Daud, 2022). Recent interventions, including the integration of artificial intelligence such as ChatGPT in Visual Basic classes, have shown promising outcomes in enhancing engagement and reducing programming anxiety (Hassan et al., 2023).

At Politeknik Balik Pulau, a CQI-based digital transformation was undertaken in the DFP40233 course. The initiative introduced VB Pocket, a mobile application aligned with the course structure and the eBook Developing Applications with Visual Basic .NET, previously validated for its pedagogical strength in programming education (Shanmugam et al., 2024).

Problem Statement
The Course Outcome Review Report (CORR) for Session I 2024/2025 highlighted deficiencies in students' ability to apply programming concepts, particularly in data handling and debugging. These findings echo national challenges in technical education delivery, where students require more accessible, scaffolded, and flexible learning tools (Rahim et al., 2019). While prior studies have incorporated AI chatbots to support real-time coding feedback (Hassan et al., 2023), this intervention uniquely fused a mobile-first model with a validated eBook framework (Shanmugam et al., 2024).

Figure 1 : Course Outcome Review Report (CORR) Session I 2024/2025

Methodology

Development of VB Pocket

VB Pocket is a mobile application tailored for the DFP40233 syllabus. It consolidates lesson notes, worked examples, practice exercises, and coding walkthroughs into a single, on-demand platform. This initiative drew conceptual backing from the Developing Applications with Visual Basic .NET eBook, which was previously shown to support students' proficiency through structured and application-based learning (Shanmugam et al., 2024).

eBook and AI Integration in T&L

The eBook was systematically incorporated into weekly teaching activities. Chapters were paired with practical tasks in VB Pocket, allowing students to apply structured concepts on real devices. Inspired by the success of ChatGPT-supported learning experiences in other institutions (Hassan et al., 2023), in-class discussions also incorporated AI-generated problem-solving examples, which enhanced curiosity and promoted coding fluency.

Results and Discussion

Comparative CORR data from Session II 2024/2025 showed improved attainment across key outcomes, including the ability to implement control structures, connect to SQL databases, and debug applications. The results mirror findings by Hassan et al. (2023), who highlighted the impact of digital augmentation—especially AI-driven and mobile interfaces—on student motivation and comprehension.

Figure 1 : Course Outcome Review Report (CORR) Session I 2024/2025

Figure 2 : Course Outcome Review Report (CORR) Session I 2024/2025

Moreover, students expressed higher levels of satisfaction with their ability to revise independently and complete projects confidently using VB Pocket and the eBook. This reinforces the argument by Shanmugam et al. (2024) that eBook-based pedagogy, when aligned with practical activities, significantly deepens knowledge transfer in programming.

Conclusion

This CQI-driven integration of VB Pocket and a validated Visual Basic.NET eBook proved effective in enhancing learning outcomes and digital competence among diploma students. The model not only improved technical skills but also transformed the learning culture into a more student-centred, exploratory process. In future cycles, expansion into AI-enhanced real-time coding support, such as the integration of ChatGPT API within the app itself, is recommended.

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