



AIS VISUAL LAB (AVL): A GAMIFIED COLLABORATIVE PLATFORM FOR LEARNING DATA FLOW DIAGRAMS IN ACCOUNTING INFORMATION SYSTEMS

Ros Amalina Zakaria^{1*}, Nik Zam Nik Wan², Azilawati Abdullah @ Ab Aziz³, Nor Asmawani Che Hassan⁴

^{1,2,3,4} Faculty of Accountancy, Universiti Teknologi MARA (UiTM), Cawangan Kelantan, Malaysia

¹ Email: amalina86@uitm.edu.my

² Email: nikzam@uitm.edu.my

³ Email: azila430@uitm.edu.my

⁴ Email: asmawani@uitm.edu.my

**Corresponding author*

ABSTRACT

Accounting Information Systems (AIS) courses require students to understand systems documentation techniques such as Data Flow Diagrams (DFD). However, many students find it difficult to visualise business processes and relationships between external entities, processes, data stores, and data flows when learning through traditional lecture-based approaches. This challenge often results in low engagement and limited practical skills in constructing system documentation. To address this issue, this study introduces AIS Visual Lab (AVL), a digital learning innovation designed to enhance students' understanding of Level 0 Data Flow Diagrams through interactive and gamified learning activities. AIS Visual Lab integrates visual diagram construction using Lucidchart with a gamified collaborative learning approach. Students are organised into groups and given a business scenario that requires them to analyse a system and construct a Level 0 Data Flow Diagram. Each group completes a mission to design the diagram using Lucidchart and uploads their work to Padlet, which functions as a shared gallery for class interaction. The activity incorporates gamification elements where groups present their diagrams, evaluate other groups' work, and identify possible diagram errors or improvements. Peer feedback and instructor guidance are then provided to reinforce correct system documentation concepts. This approach transforms the traditional lecture-based method into an active learning experience that promotes collaboration, critical thinking, and analytical skills similar to real-world system analysis practices. The implementation of AIS Visual Lab in AIS learning is expected to improve students' conceptual understanding of DFD, increase engagement, and strengthen practical documentation skills. The innovation demonstrates how the integration of digital tools, collaborative learning, and gamification can enhance the teaching and learning of complex concepts in Accounting Information Systems education.



KEYWORDS: Accounting Information Systems, Data Flow Diagram, Gamified Learning, Interactive Learning, Systems Documentation Skills.

PROBLEM AND OBJECTIVE

Students in AIS courses face persistent challenges in understanding Data Flow Diagrams (DFD), particularly in visualising system processes and differentiating between key components. Students sometimes get confused between process, data store and external entity in drawing the DFD. In addition, the traditional way offers limited hands-on practice in constructing diagrams and lead to low student engagement. This traditional lecture-based approaches often result in passive learning and limited skill development (Prince, 2004).

Research shows that students learn more effectively when actively engaged in problem-solving and collaborative activities (Johnson & Johnson, 2009). Additionally, visual learning tools can significantly enhance comprehension of complex systems and processes (Mayer, 2009).

Therefore, the objectives of this paper is to enhance students' understanding of Level 0 Data Flow Diagrams, promote active and collaborative learning in AIS courses, improve students' systems documentation skills and increase engagement through gamified learning activities.

DESIGN DESCRIPTION

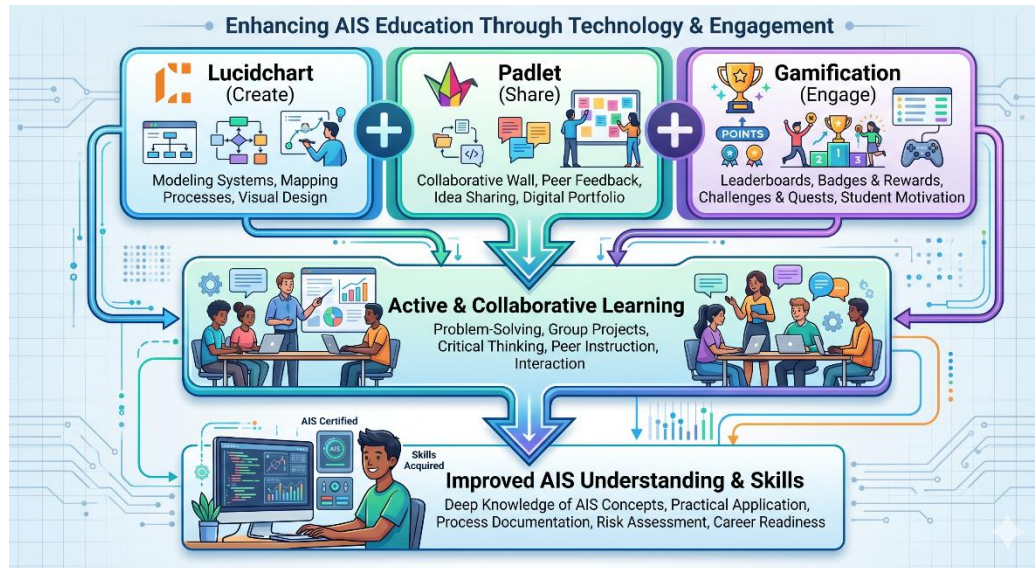
AIS Visual Lab (AVL) integrates principles of constructivism, where learners actively build knowledge through interaction and experience (Vygotsky, 1978), and experiential learning, where learning occurs through doing and reflecting (Kolb, 1984). Students will construct diagram using Lucidchart, do gamified mission-based learning activities, experience collaborative learning through group challenges, peer review and discussion using Padlet.

Gamification elements such as missions, peer challenges, and feedback mechanisms are incorporated to increase motivation and engagement (Deterding et al., 2011; Hamari et al., 2014). The use of Lucidchart supports visual learning, which is critical for understanding system relationships (Mayer, 2009), while Padlet facilitates collaborative knowledge sharing.

This combination of tools and pedagogy creates an immersive learning environment that mirrors real-world system analysis practices in AIS education (Behl & Ferreira, 2014).



VISUALS



NOVELTY AND UNIQUENESS

The uniqueness of AVL lies in its integration of multiple pedagogical approaches gamification, collaborative learning, and visual learning into a unified digital framework.

While previous studies have explored gamification or collaborative learning independently, AVL combines these elements with system documentation practice in AIS, creating a holistic and applied learning experience (Hamari et al., 2014; Johnson & Johnson, 2009).

BENEFITS TO MANKIND

AIS Visual Lab enhances educational effectiveness by promoting active learning, collaboration, and digital literacy in higher education. It equips students with essential analytical and system documentation skills required in modern accounting and information systems professions. By improving conceptual understanding and practical competencies, AVL helps produce industry-ready graduates. Additionally, it supports educators in adopting innovative teaching approaches, contributing to more engaging and effective learning environments aligned with evolving technological and professional demands.

COMMERCIAL POTENTIAL

AIS Visual Lab demonstrates strong commercial potential as a scalable digital teaching toolkit for higher education institutions. It can be developed into a structured module or integrated into Learning Management Systems (LMS) for wider adoption. Its flexibility allows application across multiple courses, including Accounting Information Systems and Systems Analysis. The innovation offers a competitive advantage by combining gamification, collaboration, and visual learning in a single platform, making it attractive for universities, training providers, and professional development programmes.

CONCLUSION

AIS Visual Lab (AVL) presents an innovative approach to enhancing the teaching and learning of Data Flow Diagrams in Accounting Information Systems courses. By integrating gamification, collaborative learning, and digital tools, AVL transforms traditional lecture-based methods into an interactive and student-centred learning experience. This approach not only improves students' conceptual understanding but also strengthens their analytical and system documentation skills.

The implementation of AVL demonstrates the potential of combining pedagogy and technology to address learning challenges in complex subjects. Future development may focus on expanding AVL into a comprehensive digital learning toolkit with enhanced features such as automated feedback and performance analytics. Overall, AVL contributes to improving the quality and relevance of AIS education.

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