TAXIS: A GAMIFIED SPREADSHEET FOR EMPLOYMENT INCOME TAX LEARNING

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ABSTRACT

Income tax on employment is often regarded as one of the most challenging topics in Taxation 1 for accounting students. This difficulty arises from the complex classification of income components and the multitude of tax rules and regulations. Students frequently struggle with the application of Section 13(1) of the Income Tax Act 1967, especially when distinguishing between various forms of employment income, such as allowances, perquisites, and benefits-in-kind. This confusion often leads to incorrect tax classifications and poor academic performance.. To address these challenges, there is a pressing need for an innovative, technology-driven pedagogical approach that simplifies taxation concepts and enhances students' understanding through interactive learning strategies. This study introduces TAXIS, a gamified spreadsheet-based learning tool designed for first-year accounting students enrolled in TAX441 (Taxation 1). TAXIS features two interconnected worksheets that facilitate guided and problem-based learning. In the first worksheet, students classify and calculate employment income while identifying relevant tax sections. The second worksheet automatically reflects correct responses in the Employment Income Statement, allowing students to visualize the final outcome of their answers. Automated validation features provide immediate feedback, marking students' inputs as "TRUE" or "FALSE" based on the accuracy of their calculations and the correct identification of tax sections. This real-time feedback supports self-directed learning by enabling students to identify and correct mistakes as they occur. The novelty of TAXIS lies in transforming a conventional spreadsheet into an interactive learning environment that supports real-time tax computation and classification. This approach enhances student engagement, improves conceptual understanding, and increases accuracy in tax classification. Moreover, TAXIS demonstrates strong scalability, as it can be easily adapted to other taxation topics and accounting courses using commonly available spreadsheet software.

KEYWORDS: Employment income, Gamified Spreadsheet-based Learning, Taxation Education, Problem - Based Learning

PROBLEM STATEMENT

Income tax on employment income is often regarded as one of the most challenging topics in Taxation 1 for accounting students. This difficulty largely stems from the complexity of classifying income components, where students must accurately categorize various elements of employment income and apply numerous tax rules and regulations. Many students struggle to implement Section 13(1) of the Income Tax Act 1967, particularly in distinguishing between allowances, perquisites, and benefits in

kind. These challenges frequently lead to the misclassification of employment benefits, inaccurate tax computations, and poor academic performance. Traditional lecture-based teaching methods often fall short in providing immediate feedback and interactive learning opportunities, hindering students' mastery of the topic.

Research by (Tettamanzi et al., (2023) indicates that digital learning platforms can enhance learning outcomes by allowing students to apply theoretical knowledge in simulated environments, especially in areas like bookkeeping, taxation, and financial analysis. These platforms also promote the development of independent learning and critical problem-solving skills among students (Haleem et al., 2022). Previous studies have shown that the use of information and communication technology (ICT) in accounting education improves efficiency, accuracy, and overall learning effectiveness (Ghasemi et al.,2011; Taiwo, 2016). However, the application of such tools in taxation education remains limited and lacks structured interactivity, underscoring the need for an innovative, technology-driven pedagogical solution.

To address this issue, we introduce TAXIS: a gamified, spreadsheet-based learning tool designed to simplify the study of employment income tax and help students grasp its key concepts more effectively. The specific objectives of this project are:

1. Develop a gamified spreadsheet-based learning tool (TAXIS) to facilitate understanding of employment income.
2. Assist students in accurately classifying components of employment income and applying relevant tax sections.
3. Enhance student engagement through interactive, problem-based learning approaches.
4. Provide immediate feedback to improve learning outcomes and self-assessment capabilities.

DESIGN DESCRIPTION

This study employs a **descriptive design** to develop and implement an educational innovation tool called TAXIS. The tool is created using spreadsheet software and consists of two interconnected worksheets. The first worksheet enables students to classify components of employment income, calculate amounts, and identify relevant tax sections. The second worksheet automatically generates the Employment Income Statement based on the students' inputs. Embedded formulas validate the answers, providing instant feedback in the form of "TRUE" or "FALSE." This design facilitates both guided learning and problem-based learning, allowing students to engage actively with the content while receiving real-time evaluations.

By integrating guided learning and problem-based learning, this design helps students actively explore taxation concepts while receiving timely feedback, aligning with the demand for practical and technology-driven accounting education (Lee et al., 2018).

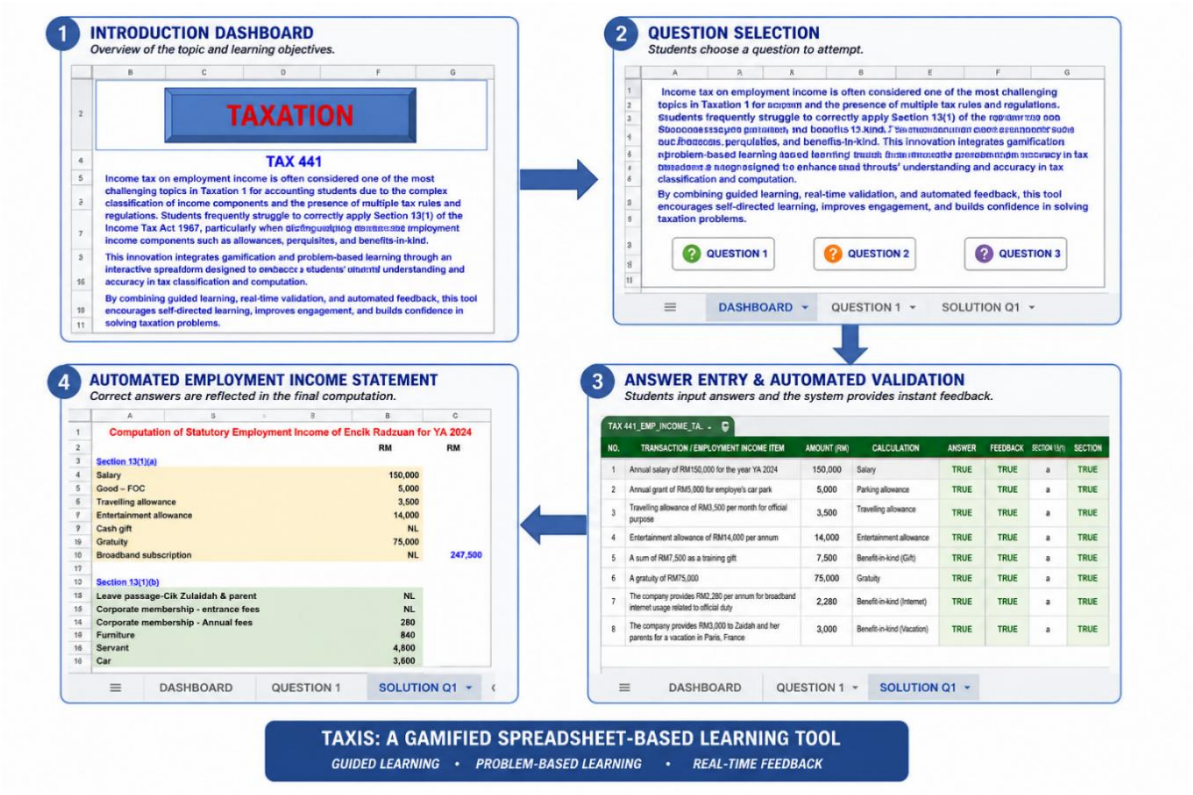
VISUALS

TAXIS incorporates several visual and interactive elements to enhance learning effectiveness, including:

- Structured spreadsheet layout guiding step-by-step tax computation
- Automated Employment Income Statement reflecting students' answers
- Immediate feedback indicators (TRUE/FALSE) for accuracy checking
- Clear segmentation of income categories such as allowances, perquisites, and benefits-in-kind

- Interactive cells that enable student participation and self-assessment

These visual features improve clarity, reduce cognitive load, and support experiential learning.



NOVELTY AND UNIQUENESS

TAXIS offers a unique approach by transforming a standard spreadsheet into an interactive, gamified learning environment. Unlike traditional teaching tools, TAXIS integrates real-time computation, classification, and validation within one platform. This innovative tool combines problem-based learning with automated feedback, allowing students to learn independently and enhance their conceptual understanding. Specifically designed for beginners, TAXIS addresses the learning gap for students who lack a solid foundation in taxation.

Moreover, TAXIS utilizes commonly used spreadsheet technology, aligning with industry practices where proficiency in Excel and similar tools is essential for accounting professionals (Anderson et al., 2020).

BENEFITS TO MANKIND

TAXIS provides numerous educational and societal advantages:

- Enhances students' comprehension of taxation concepts and boosts academic performance.
- Encourages self-directed and active learning among students.
- Decreases reliance on instructors for immediate feedback.
- Fosters the development of critical thinking and problem-solving skills.
- Improves financial and tax literacy for future professionals.

This innovation aligns with global trends in incorporating digital tools into education, aiming to produce capable and industry-ready graduates.

COMMERCIAL POTENTIAL

TAXIS exhibits significant commercial potential as:

- A teaching and learning resource for universities and colleges offering taxation courses.
- A training module for professional accounting and tax programs.
- A scalable digital product adaptable to various accounting and taxation subjects.
- A cost-effective solution utilizing widely accessible spreadsheet software.

The product can be commercialized through licensing, academic workshops, or integration into digital learning platforms.

CONCLUSION

In conclusion, TAXIS offers an innovative solution to the challenges students face in understanding employment income taxation. By incorporating gamification, real-time feedback, and structured guidance within a spreadsheet format, the tool significantly enhances engagement, accuracy, and conceptual clarity. Its scalability and adaptability further enhance its potential for broader application in accounting education. TAXIS not only improves learning outcomes but also marks a significant advancement in technology-enhanced pedagogy for taxation education. Additionally, TAXIS transforms traditional taxation education into a more interactive and effective learning experience.

REFERENCES

Anderson, D.R., Sweeney, D.J., Williams, T.A., Camm, J.D. and Cochran, J.J. (2020), Modern Business Statistics with Microsoft Excel, Cengage Learning, Boston, MA.

Boulianne, E. (2014), "Impact of accounting software utilization on students' knowledge acquisition: an important change in accounting education", Journal of Accounting and Organizational Change, Vol. 10 No. 1, pp. 22-48.

Ghasemi, M., Shafeiepour, V., Aslani, M. and Barvayeh, E. (2011), "The impact of Information Technology (IT) on modern accounting systems", Procedia-Social and Behavioral Sciences, Vol. 28, pp. 112-116.

Haleem, A., et al. (2022).Artificial intelligent (AI) applications for marketing: A literature-based study.September 2022. International Journal of Intelligent Networks 3(2) DOI:10.1016/j.ijin.2022.08.005

Lee, L., Kerler, W., & Ivancevich, D. (2018). Beyond Excel: Software tools and the accounting curriculum. *AIS Educator Journal*, 13(1), 44–61.

Marriott, N. (2004). Using computerized business simulations and spreadsheet models in accounting education: A case study. *Accounting Education*, 13(1), 55–70.

Taiwo, J.N. (2016), “Effect of ICT on accounting information system and organisational performance: the application of information and communication technology on accounting information system”, European Journal of Business and Social Sciences, Vol. 5 No. 2, pp. 1-15.

Tettamanzi, P., et al. (2023). "Accounting Education and Digitalization: A New Perspective After the Pandemic." *International Journal of Management in Education*.