International Journal of Business Studies and Education (IJBSAE)
ISSN (Online):2735-0940
VOLUME:2
ISSUE: 1

Enhancing Education through Business Intelligence: A Preliminary Assessment of Integrating Looker Studio into Management Information Systems Course at Politeknik Kuching Sarawak

Magdalyne Egan[1], Muhammad Nazri bin Mohamed Akbar[2]

[1] *Commerce Department, Politeknik Kuching Sarawak, Malaysia*
E-mail: magdalyne.e@poliku.edu.my

[2] *Commerce Department, Politeknik Kuching Sarawak, Malaysia*
E-mail: muhd_nazri@poliku.edu.my

Abstract

This study explores the integration of business intelligence (BI) through Looker Studio as the primary instrument in the context of a Management Information Systems (MIS) course for second-semester Diploma in Business Studies students at Politeknik Kuching Sarawak. Looker Studio is an effective business intelligence and data visualisation tool that enables users to produce interactive dashboards and reports. It allows for data-driven decision-making processes which are essential for current enterprises. The primary goal is to assess students' level of familiarity, usage behaviours, satisfaction and recommendations with Looker Studio.

We collected data through a well-organised questionnaire, which resulted in a satisfactory response rate from all 121 students currently enrolled in the course. The sample comprised 82 females and 39 boys, ranging in age from 18 to 23 years. The results suggest that the frequency of consumption was not statistically significant. Furthermore, the findings indicated that over fifty percent of the participants self-identified as lacking competence in the field of information technology. The findings further revealed that, despite a lack of major technological proficiency, over half of the participants expressed a willingness to promote Looker Studio to their friends. The results of this study provide important information for improving usability and assistance, which can increase student happiness and the instrument's educational effectiveness.

Keywords : *Business intelligence; Dashboard; Looker studio; Management Information Systems; Politeknik Kuching Sarawak*

I. INTRODUCTION

In the dynamic landscape of business education, integrating advanced technological resources is vital for preparing students with the skills needed to meet the demands of the current job marketplace. Business intelligence (BI) alternatives, such as Looker Studio, are critical in such an environment because they allow users to visualize and analyse data, encouraging effective data-driven decision-making. Looker Studio is an effective business intelligence and data visualisation tool that allows users to produce interactive visualisations and reports, which are essential for understanding complex business data.

The use of BI tools in educational settings is not simply a passing trend, but instead a vital requirement. Previous research highlights the significance of business intelligence technologies in improving educational results and equipping students for practical business obstacles. BI systems enhance decision-making processes through their ability to perform thorough data analysis and visualisation[1]. Apart from that, BI tools enhance business process comprehension and strategic planning, which are crucial proficiencies for business students[2].

Furthermore, as stakeholders' expectations and demand for quality in higher education continue to rise and evolve, it becomes imperative for higher education institutions to recognize the significance of emerging management and learning methods offered by IT innovation. Politeknik Kuching Sarawak, specifically the Commerce Department, has acknowledged the significance of these abilities and has integrated Looker Studio into its Management Information Systems (MIS) course as part of the Diploma in Business Studies programme. The purpose of this integration is to close the divide between academic understanding and practical implementation, by providing students with the essential abilities to efficiently traverse and interpret corporate data. This significance arises from an increasing recognition of the need to use data to make informed decisions that improve corporate success. Therefore, the majority of organisations in the present era have made significant financial commitments to BI and analytics, acknowledging

Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024

Publisher: ICBE Publication (NS0237611-W)

their ability to support well-informed decision-making and enhance overall results[3].

II. LITERATURE REVIEW

Over the past few years, there has been an increasing emphasis on integrating BI tools into institution courses. BI solutions, like Looker Studio, provide comprehensive features for visualising and analysing data, which are essential to promoting data-driven decision-making abilities in students. This literature review examines recent studies on the use and advantages of BI technology in educational environments, with a focus on the key factors that influence its success.

1) Benefits of BI in the education sector

People widely recognise BI technologies for their ability to transform unprocessed data into meaningful insights through sophisticated analysis and visualisation. A 2012 study demonstrated that BI technologies significantly enhance decision-making in educational settings by offering significant capabilities for data analysis[4]. Currently, higher education institutions utilise BI to facilitate decision-making processes and offer real-time information to assist top management in monitoring performance[5]. By incorporating BI tools into the curriculum, educators can offer students significant and advantageous opportunities to develop skills in data analysis and interpretation. This pedagogical approach promotes the development of critical thinking and analytical abilities.

Furthermore, BI facilitates personalised learning experiences. Previous research has indicated that data analytics in education enable the creation of customised learning paths that align with the individual performance of each student[6]. Utilising a tailored approach can lead to heightened academic performance and greater student involvement.

2) Effects on student engagement and academic achievement

A recent study has specifically investigated the impact of BI technologies on student engagement and academic performance. Implementing BI tools in educational settings can significantly enhance student engagement by fostering a more immersive and dynamic learning experience. BI tools use their visual and interactive capabilities to improve the accessibility and understanding of complex data, resulting in increased student engagement and participation.

Moreover, studies demonstrate that BI technologies enhance learning outcomes by equipping students with practical skills applicable to real-world business scenarios. Having a high level of skill in using BI technologies is becoming more and more important in today's data-focused corporate environment. Students with the ability to assess and understand data are better prepared for the requirements of the workforce. Integrating BI tools into the curriculum enhances the link between theoretical knowledge and practical implementation, leading to an enhanced educational experience[7].

Incorporating BI tools, like Looker Studio, into educational curricula offers significant benefits, including improved decision-making skills, personalised learning experiences, and better student engagement and academic performance. However, to fully realise these benefits, it is crucial to address the challenges related to data integration, technical complexity, and student proficiency. The challenges may stem from the adoption of technical innovation without well-defined objectives, inadequate management, limited financial resources, environmental constraints, and many cultural and organisational factors[8].

By providing comprehensive training and support, educators may assist students in surmounting these obstacles and acquiring proficiency in the use of BI technologies. This will empower individuals to obtain the fundamental competencies necessary to thrive in a data-centric business environment.

III. METHODOLOGY

The objective of this study is to assess the incorporation of Looker Studio into the MIS curriculum for second-semester Diploma in Business Studies students at Politeknik Kuching Sarawak. The methodology section provides a detailed description of the research design, participants, data collection methods, and data analysis procedures used in this study.

The structure and plan for conducting research are important considerations.

(1) Research design

We intentionally created the questionnaire in both English and Malay to ensure maximum clarity and comprehension for all participants. This multilingual technique was critical for addressing linguistic diversity among students and obtaining accurate and dependable responses. We recommend using appropriate parameters in the measurement instrument. An illustrative example[9] involves conducting research in Arabic and performing a double-translation process from English to Arabic, and then from Arabic back to English. We followed the methodology in reference[10] to ensure consistency with the original text.

The study employs a research methodology that incorporates quantitative methods to obtain a comprehensive understanding of the student's experiences using Looker Studio. The component

Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024
Publisher: ICBE Publication (NS0237611-W)

entails employing structured surveys to collect quantitative data on students' familiarity, usage patterns, and satisfaction levels. We obtained the measurements using a five-level Likert scale, which ranged from "very dissatisfied" (1) to "very satisfied" (5) for satisfaction level questions.

(2) Participants

The study includes 121 second-semester students pursuing a Diploma in Business Studies who are currently enrolled in the MIS course at Politeknik Kuching Sarawak.

(3) Methods for Collecting Data

(a) Survey:

To collect data on various aspects of student's interactions with Looker Studio, we created a well-designed questionnaire. We segmented the questionnaire into multiple sections, each focusing on distinct variables. To gather demographic information, we are asking about gender and age. Ask about the user's Looker Studio experience, duration, and frequency. We evaluate students' self-perceived technical proficiency by asking questions that gauge their level of technological expertise. The survey also included questions to gauge students' overall satisfaction with Looker Studio and their likelihood of recommending it to others.

(4) Data Analysis

We examined the quantitative data obtained from the structured questionnaire using descriptive statistics. Using frequencies and percentages, we summarised the students' familiarity, usage patterns, tech-savvy, satisfaction levels, and recommendations about Looker Studio. The analysis was conducted using statistical applications such as Google Sheets.

(5) Methodology

We carried out the data-gathering process in the following manner:

(a) Questionnaire distribution: Using Google Forms, we distributed the structured questionnaire to all 121 students following their final MIS assessment. We clarified the study's objective and guaranteed the confidentiality and anonymity of students' comments.

(a) Data collection: After the final assessment, students had ample time to complete the questionnaire. This method guaranteed a high response rate and facilitated the prompt resolution of any uncertainties.

(c) Data analysis: To methodically analyse the gathered data, we used the aforementioned techniques. We then amalgamated the data to offer a comprehensive understanding of the integration of Looker Studio into the MIS course.

This methodology guarantees a strong and thorough evaluation of the integration of Looker Studio into the MIS course, gathering input to guide future enhancements and improve the educational experience.

IV. RESULT AND DISCUSSION

The study aimed to evaluate Looker Studio's integration into the MIS course for second-semester Diploma in Business Studies students at Politeknik Kuching Sarawak. The findings provide insights into the student's familiarity, usage patterns, tech-savvy, satisfaction levels, and overall perceptions of Looker Studio.

Table 1 Demographic profile, level of familiarity, and usage behaviours.

Item		F	%
Gender			
	Male	82	32.2
	Female	39	67.8
Age			
	18 – 19 years old	101	83.5
	20 – 21 years old	15	12.4
	22 – 23 years old	5	64.1
Have you heard about Looker Studio before you enrol on the Management Information Systems course?			
	Yes		24.0
	No		76.0
Duration of use			
	Less than a month		63.7
	1-3 months		14.0
	3-6 months		0.8
	6-12 months		0.0
	More than 1 year		0.0
	Not used at all		21.5
Frequency of use			
	Daily		0.0
	Weekly		5.8
	Monthly		1.7
	Rarely		63.6
	Never		28.9
Self-perceived tech-savviness			
	Yes		44.6
	No		55.4

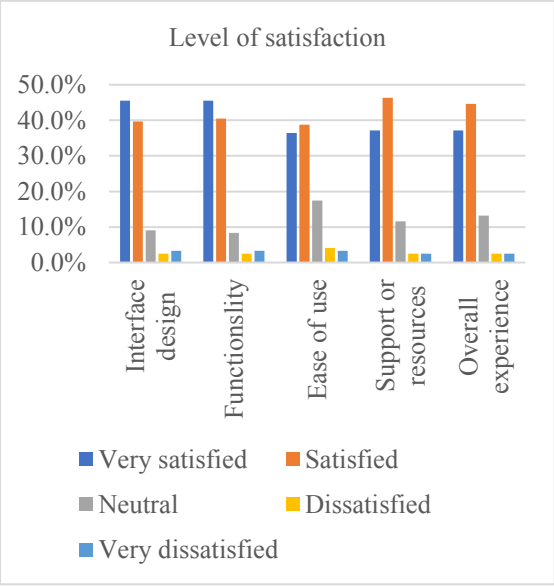
Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024
Publisher: ICBE Publication (NS0237611-W)

Table 1 displays 121 participants in the study, with 82 (67.8%) females and 39 (32.2%) males, all aged between 18 and 23 years. This demographic information provides a context for understanding the varied experiences and perspectives of the students.

According to the data presented in Table 1, 92 students, which accounts for 76% of the total, were not familiar with Looker Studio before taking the course. A total of 29 students, which accounts for 24% of the total, possessed prior knowledge of the tool. A total of 77 students, accounting for 63.6% of the sample, used Looker Studio for less than one month. A total of 26 students, accounting for 21.5% of the sample, reported not having used it at all. A total of 17 students, which accounts for 14% of the total, used it for 1–3 months. One student, accounting for 0.8% of the total, used it for 3–6 months.

A total of 77 students, accounting for 63.6% of the sample, reported using Looker Studio infrequently. Of the total number of students, 35 individuals, representing 28.9% of the sample, reported never using Looker Studio. Out of the total number of students, 7 individuals, representing 5.8% of the student population, have used it weekly. Only two students, or 1.7% of the total, used Looker Studio monthly. The results suggest that most students had limited familiarity with Looker Studio and only used it sporadically throughout the semester. A total of 67 students, accounting for 55.4% of the participants, reported that they did not perceive themselves as being proficient in technology.

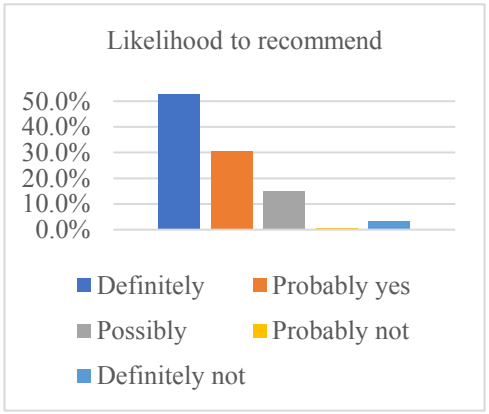
Figure 1 Level of satisfaction



Out of the total number of students, 54 individuals, comprising 44.6% of the group, identified themselves as tech-savvy. A study by [11] indicates that higher education institutions that view BI as significantly beneficial are more likely to adopt and implement BI systems. This is because BI can offer numerous advantages to higher education institutions, such as improved decision-making, increased operational efficiency, and a deeper understanding of student and institutional performance. The distribution illustrates an even combination of self-perceived technical expertise among the students.

According to Figure 1, a significant majority of students (85.2%) expressed satisfaction with the interface design of Looker Studio, suggesting that the platform's design is both user-friendly and visually appealing. A minority of respondents (5.8%) voiced displeasure, indicating the potential for slight enhancements. Looker Studio's functionality was highly regarded, with 86% of students reporting pleasure with positive reception of the interface design. The platform's extensive range of features and its capability to fulfil students' requirements for data analysis and visualisation are the reasons behind this significant degree of satisfaction.

Figure 2 Likelihood to recommend Looker Studio



Among the students, a considerable proportion (75.2%) reported finding Looker Studio user-friendly. However, a major percentage (17.4%) expressed a neutral opinion, while a smaller fraction (7.4%) reported being unsatisfied. This suggests that while the platform is generally user-friendly, certain aspects of the user experience could benefit from simplification or more effective support. The support and resources were well-received by students, with a satisfaction rate of 83.5%. Nevertheless, a significant proportion of students, specifically 11.6%, maintained a neutral stance, while 5% expressed dissatisfaction, indicating a clear requirement for more extensive or easily obtainable support materials.

Regarding the whole experience, a significant majority of students, specifically 81.8%, expressed satisfaction with Looker Studio. 13.2% of the respondents had a neutral opinion, while 5%

Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024
Publisher: ICBE Publication (NS0237611-W)

voiced discontent. This suggests that although the overall reception is positive, making ongoing enhancements and updates could further enhance the user experience.

Figure 2 shows a significant majority of students strongly advocated for Looker Studio, with 52.9% (64 students) unequivocally indicating that they would "definitely" suggest the platform. The considerable level of enthusiasm indicates that more than half of the students had an exceedingly positive experience and derived substantial value from using Looker Studio for their coursework. Furthermore, an additional 30.6% (37 students) indicated that they would "probably" recommend Looker Studio. When added to the number of students who would "definitely" suggest it, the total percentage of students likely to recommend the platform is 83.5%. This suggests that many students had a favourable experience, although they may not have been extremely enthusiastic. Perhaps almost 14.9% (18 students) expressed neutrality, suggesting a degree of confusion or ambivalence towards the platform. While some students found Looker Studio to be beneficial, they faced significant obstacles that hindered them from giving it a full recommendation. Unlikely: Merely 0.8% (equivalent to 1 student) displayed a minor tendency to not recommend Looker Studio. Without a doubt, in the same vein, 0.8% (1 student) expressed their complete lack of recommendation for the platform.

V. CONCLUSION

The survey findings suggest that Looker Studio is highly regarded by students, especially for courses that include extensive data analysis, such as Management Information Systems. Looker Studio's user interface design garners widespread praise for its intuitive and visually captivating layout, aligning with research emphasising that underscores the significance of user-friendly interfaces in enhancing educational experiences [12][13].

Research on the effectiveness of comprehensive data visualisation tools[12][13] shows that Looker Studio's many features meet the different needs of students who need to analyse data. Although the platform is largely user-friendly, there is a recognised opportunity to improve its intuitiveness, which aligns with the broader literature emphasising the significance of user-friendly designs in educational technology [12][13].

While the current assistance resources are good, we could enhance them with more comprehensive materials to ensure their adequacy. This statement highlights the importance of providing robust assistance and training to enhance the efficacy of instructional tools, as emphasised by previous research [14][15].

ACKNOWLEDGMENT

We would like to extend our heartfelt gratitude to the students of the Diploma in Business Studies, second semester, at Politeknik Kuching Sarawak, for their valuable cooperation in completing the questionnaire. Your comments and feedback have been critical in understanding how to incorporate Looker Studio into the Management Information Systems course.

We would like to sincerely thank the Head of the Commerce Department and the Programme Coordinator for their trust and support in integrating Looker Studio into the curriculum. Your unwavering faith in our efforts has been critical to the success of our project.

We express our sincere appreciation to all those who have assisted in our research endeavour, including academic staff, administrative officials, and our peers. Your assistance has been vital in overcoming the challenges and ensuring the smooth progress of our project. We value the contributions and unwavering support from every one of you.

We do not have any funding for this study.

REFERENCES [IEEE FORMAT]

[1] N. S. Olszak, C. M., & Ziemba, E. (2007). Approach to building and implementing business intelligence systems. Interdisciplinary Journal of Information, Knowledge, and Management, 2, 135-148.

[2] Wixom, B. H., Watson, H. J., & Werner, T. (2011). Developing an enterprise business intelligence capability: The Norfolk Southern journey. MIS Quarterly Executive, 10(2), 61-71

[3] Divatia, A.S., Tikoria, J., Lakdawala, S., 2021. Emerging trends and impact of business intelligence & analytics in organizations: case studies from India. Bus. Inf. Rev. 38(1), 40–52. https://doi.org/10.1177/0266382120969265 .

[4] Romero, C., & Ventura, S. (2010). Educational data mining: A review of the state of the art. IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews), 40(6), 601-618.

[5] Sorour, A., Atkins, A.S., Stanier, C.F., Alharbi, F.D., 2020. The role of business intelligence and analytics in higher

Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024

Publisher: ICBE Publication (NS0237611-W)

education quality: a proposed architecture. 2019 International Conference on Advances in the Emerging Computing Technologies (AECT). IEEE, pp. 1–6. https://doi.org/10.1109/AECT47998.2020.9194157 (February).

[6] Al-Nuaimi, E., Shanks, G., & Spedding, T. (2013). The role of business intelligence systems in organizational performance: A review. Journal of Intelligent Manufacturing, 24(4), 671-685.

[7] Knight, J., & Ertmer, P. A. (2009). Examining the intersection of visual culture and the use of instructional technology in higher education classrooms. International Journal of Teaching and Learning in Higher Education, 21(2), 135-144.

[7] G. Post and D. L. Anderson, *Management Information Systems*. McGraw-Hill Companies,Incorporated, 2005.

[8] Tarhini, A., Tarhini, J., Tarhini, A., 2019. Information technology adoption and implementation in higher education. Int. J. Educ. Manag. 33 (7), 1466–1482. https://doi.org/10.1108/ijem-04-2018-0144.

[9] Hmoud, H., Al-Adwan, A. S., Horani, O., Yaseen, H., & Al Zoubi, J. Z. (2023). Factors influencing business intelligence adoption by higher education institutions. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(3), 100111.

[10] Ataseven, C., Prajogo, D.I., Nair, A., 2013. ISO 9000 internalization and organizational commitment—implications for process improvement and operational performance. IEEE Trans. Eng. Manag. 61 (1), 5–17. https://doi.org/10.1109/ EM.2013.2285344.

[11] Owusu, A., Ghanbari-Baghestan, A., Kalantari, A., 2017. Investigating the factors affecting business intelligence systems adoption: a case study of private universities in Malaysia. Int. J. Technol. Diffus. 8 (2), 1–25. https://doi.org/10.4018/IJTD.2017040101.

[12] Center for Academic Innovation, University of Michigan. (2021). XR Initiative – Center for Academic Innovation. Retrieved from Michigan IT News

[13] SAS. (2019). SAS Education Analytical Suite. Retrieved from SAS Official Site

[14] Djerdjouri, M., 2020. Data and business intelligence systems for competitive advantage: prospects, challenges, and real-world applications. Merc. Y. Neg. 41, 5–18.

[15] Chaudhry, K., Dhingra, S., 2021. Modeling the critical success factors for business intelligence implementation: an ISM approach. Int. J. Bus. Intell. Res. (IJBIR) 12 (2), 1–21. https://doi.org/10.4018/ijbir.20210701.oa3.

AUTHOR'S INFORMATION

First Author: Magdalyne Egan 	Commerce Department, Politeknik Kuching Sarawak, KM22, Jalan Matang, 93050 Kuching, Sarawak, Malaysia E-mail: magdalyne.e@poliku.edu.my
Second Author: Muhammad Nazri bin Mohamed Akbar 	Commerce Department, Politeknik Kuching Sarawak, KM22, Jalan Matang, 93050 Kuching, Sarawak, Malaysia E-mail: muhd_nazri@poliku.edu.my

Received: 20 March 2024
Revised: 25 March 2024
Accepted: 08 April 2024
Publisher: ICBE Publication (NS0237611-W)