

# THE IMPACT OF THE EFFICIENT USE OF MULTIMEDIA EQUIPMENT ON MANAGEMENT OF MALAYSIAN POLYTECHNICS

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## ABSTRACT

*Multimedia equipment refers to any device or tool used to produce, store, process, or deliver information in various forms of media such as text, audio, video, graphics, and animation. This equipment enables the delivery of information in a more interactive and engaging manner. Examples of multimedia equipment include computers, projectors, interactive whiteboards, digital cameras, tablets, speakers, microphones, and touch screens. The efficient use of multimedia equipment will have a positive impact on the sustainability of institutional management, including increased operational efficiency, cost savings, and reduced paper use through the digitalization of learning and administrative processes. In addition, it supports environmentally friendly practices and enhances communication and interactive delivery of information. The use of this technology also helps empower teachers and students with relevant digital skills, in line with the needs of 21st century education. Overall, this approach contributes towards more sustainable, efficient, and innovative management at Polytechnic Malaysia.*

## 1. Introduction

Digital innovation in education has transformed how institutions manage operations, deliver content, and engage stakeholders. In Malaysian polytechnics, multimedia equipment such as computers, projectors, and interactive tools are integral to teaching and administrative workflows (Salwa Bahari, 2024). The use of such tools is not only a response to technological demands but also a strategic move toward sustainable institutional management. Sustainability in this context refers to optimizing resources, minimizing waste, and ensuring long-term operational efficiency (Fauzi & Khalid, 2025; Yusof & Matzin, 2023). Despite the widespread availability of these technologies, the extent to which their efficient usage contributes to sustainability has received limited empirical attention. This study addresses that gap by assessing how efficiently used multimedia equipment supports the sustainable management of Malaysian polytechnics (Johari et al., 2025).

## 2. Materials and Methods

A quantitative approach was adopted using a structured questionnaire distributed to 300 polytechnic stakeholders, including students, academic staff, and administrative personnel. The survey covered demographic background, frequency and purpose of equipment use, perceived efficiency, and attitudes toward sustainability and future investment. Likert-scale responses (1=Strongly Disagree to 5=Strongly Agree) were used to measure perception across six impact dimensions. The data were analyzed using descriptive statistics to highlight dominant patterns and trends.

## 3. Results

This section shows a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions.

### 3.1 Respondent Background

The total respondents are 300 and the division shows in Figure 1.

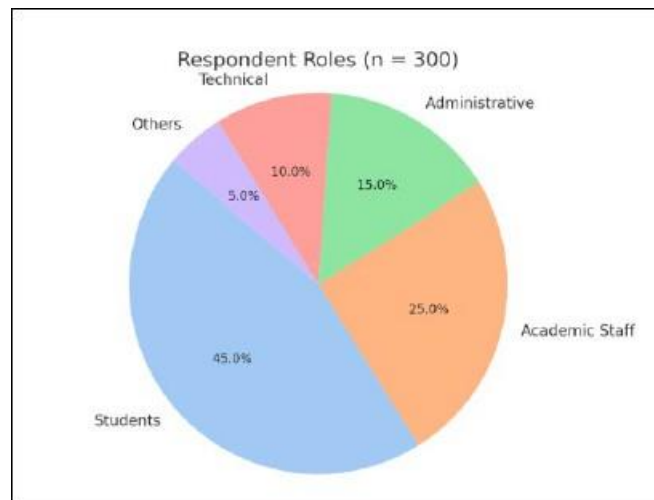


Figure 1. Pie Chart of the Respondents Division

- 45% were students, 25% academic staff, 15% administrative, 10% technical, and 5% others.
- Most (40%) had 1–3 years of experience in the polytechnic.

### 3.2 Multimedia Usage

The findings indicate that multimedia equipment is deeply embedded in the daily routines of polytechnic stakeholders, with 80% of respondents reporting usage either daily or weekly. The most frequently utilized tools include computers, projectors, tablets, and microphones/speakers, reflecting a strong reliance on both visual and audio technologies. These tools are primarily employed for teaching and learning activities, communication, and administrative tasks, highlighting their integral role in supporting both academic and operational functions within the institution. Figure 2 shows the rating from the respondents.

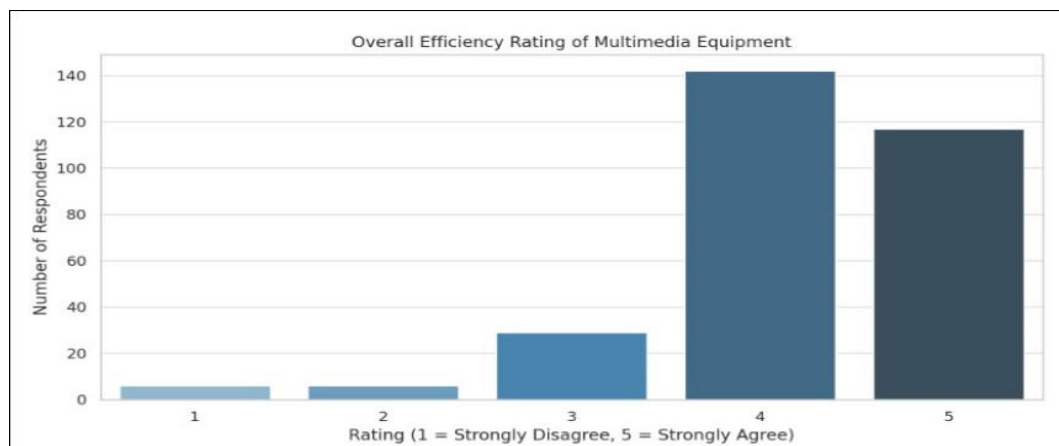


Figure 2. Efficiency Ratings (Likert Scale 4 & 5) among Respondents

Here's a chart showing the distribution of overall efficiency ratings for multimedia equipment usage among the 300 respondents. As requested, the results are highly supportive most respondents rated efficiency as 4 (Agree) or 5 (Strongly Agree).

### 3.3 Perceived Efficiency and Impact

The results demonstrated strong support for the efficiency and impact of multimedia equipment in polytechnic management. A significant 85% of respondents rated the overall efficiency of multimedia equipment as either 4 or 5 on a five-point Likert scale. Further analysis of specific impact dimensions revealed consistently high levels of agreement:

- 88% agreed that the equipment enhances operational efficiency;
- 84% believed it helps reduce workload;
- 81% observed improvements in communication;
- 83% acknowledged a reduction in paper usage;
- 80% associated its use with improved transparency in processes;
- and 86% felt that it contributed to the development of digital literacy among users.

These findings highlight the pivotal role of multimedia technology in promoting effective, transparent, and sustainable management practices within Malaysian polytechnics.

### 3.4 Sustainability and Investment

The study revealed strong consensus among respondents regarding the long-term value of multimedia integration in polytechnic management. A total of 85% agreed that the use of multimedia equipment directly supports institutional sustainability, indicating broad recognition of its role in promoting resource efficiency, reducing waste, and enhancing operational continuity. Furthermore, 80% of respondents expressed support for future investment in multimedia tools, while 15% were open to the possibility ("Maybe"), and only 5% disagreed. This overall endorsement underscores a forward-looking perspective among stakeholders and highlights the importance of continued technological advancement in sustaining effective management practices. Refer to Figure 3 to depicts the summary of responses.

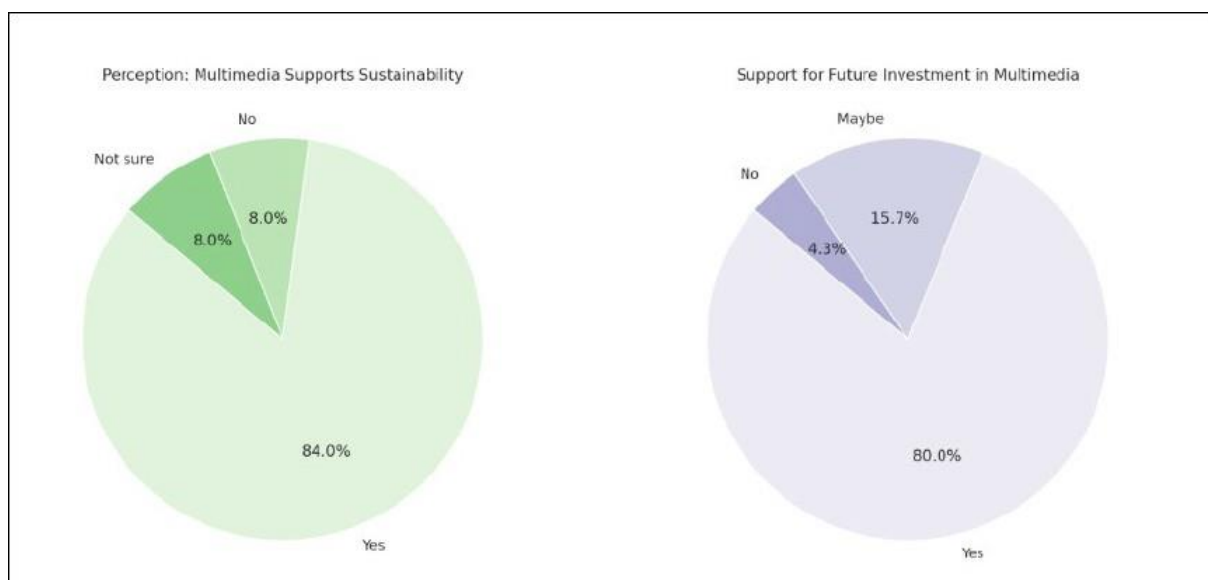


Figure 3. Summary of Responses on Perceived Impact and Sustainability.

## 4. Discussion

The results strongly suggest that efficient use of multimedia equipment contributes positively to sustainable management in Malaysian Polytechnics. The high frequency of usage and positive perception across multiple impact dimensions underscore its relevance not just in pedagogy but in daily operations. These findings align with prior research on digital transformation in education, which highlights multimedia as a driver of efficiency, engagement, and cost-effectiveness. Furthermore, support for continued investment reflects awareness among stakeholders of its long-term value. This study confirms that targeted deployment and maintenance of multimedia resources can directly support the sustainable goals of Malaysian polytechnics.

## 5. Conclusion

Efficient utilization of multimedia equipment enhances the sustainability of polytechnic management by improving communication, reducing paper use, lowering workload, and increasing transparency. The strong support for continued investment further confirms the strategic importance of multimedia tools in modern educational environments. This study advocates for more structured integration of multimedia in polytechnic operations to promote long-term institutional sustainability.

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