Exploring Government, Industry, and Academia Collaborations for Effectiveness and Sustainability in the Multimedia Art Industry.

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Abstract

This study investigates the effectiveness of Government-Industry-Academia Collaborations (GIAC) in supporting sustainable growth in Malaysia's multimedia industry. Focusing on the roles of government, industry, and academia, it identifies key factors for building long-term partnerships, such as curriculum alignment with industry needs, government policy impacts, and challenges in sustaining collaboration.

Using an Explanatory Sequential Case Study approach, the research combines quantitative surveys and qualitative interviews with multimedia sector stakeholders. Findings reveal major barriers, including sustainability challenges, misalignment between academic training and industry requirements, and limited government incentives.

The results highlight the importance of strong leadership, a long-term vision, and performance-based incentives to enhance GIAC initiatives. Improving curriculum alignment and communication among stakeholders is also essential for preparing a job-ready workforce.

The study offers practical recommendations to optimize GIAC efforts, aiming to boost talent development and drive growth in Malaysia's multimedia sector.

Keywords: Government, Industry, and Academia Collaborations (GIAC), Multimedia Industry, Sustainability, Effectiveness, Curriculum Alignment, Government Support.

1 Introduction

Malaysia's multimedia industry—including animation, gaming, and digital content—has become a key driver of economic growth, generating demand for skilled talent to sustain this momentum (BERNAMA, 2024). However, a persistent skills gap exists between the competencies gained through academic training and the practical needs of the multimedia industry. This misalignment hinders the industry's growth potential and affects Malaysia's ambition to establish itself as a leader in multimedia innovation.

To address this gap, Government-Industry-Academia Collaborations (GIAC) have emerged as crucial frameworks for aligning education with industry requirements, supporting the sector's sustainable development. GIAC initiatives, such as TalentCorp's CEO@Faculty Programme, incorporate industry insights into academic curricula and provide students with practical, industry-relevant experience through internships and hands-on training (HR In Asia, 2016). These collaborations aim to prepare a job-ready workforce capable of meeting evolving industry demands, which is essential for maintaining the multimedia sector's competitiveness and fostering long-term innovation.

The Malaysian government's Education 5.0 initiative further underscores the need for sustainable, tech-driven learning that adapts to industry trends. Education 5.0 promotes personalized and technologically enhanced education; however, implementing advanced technologies such as VR/AR and the Metaverse has proven costly, widening disparities between institutions with varying levels of resources (Ahmad et al., 2023). Financial constraints, rapid technological advancements, and uneven access to digital infrastructure challenge the

sustainability of these collaborations, as many institutions struggle to keep pace with the industry's evolving demands (Mustafa et al., 2019).

Education is a vital pillar for national development, and to support sustainable economic growth, academic institutions must evolve alongside technological and industrial advancements (Alharbi, 2023). If educational programs fail to produce industry-ready graduates, sectors such as multimedia risk stagnating, which may diminish Malaysia's competitiveness on the global stage (Azmi et al., 2021).

A major challenge is the limited industry exposure for academic faculty, which impacts the quality of graduates entering the workforce. Recognizing this, Talent Corporation Malaysia, in collaboration with the Ministry of Higher Education and the Malaysia Digital Economy Corporation (MDEC), launched the Industry-Academia Collaboration (IAC) initiative in 2016. This initiative aims to sustain engagement between industry and academia, ensuring that curricula stay relevant to industry needs and students acquire practical skills that enhance their employability and readiness for the workforce (HR In Asia, 2016).

This research examines the sustainability and impact of GIAC initiatives in Malaysia's multimedia sector, focusing on the roles of government, private colleges, and industry partners. By evaluating how collaboration models and educational programs contribute to long-term success, this study aims to identify factors that strengthen sustainable partnerships. The analysis will also highlight the significance of coordinated efforts between academia, industry, and institutions like Clazroom College in fostering industry-ready talent, which is essential for sustaining growth and competitiveness in Malaysia's multimedia industry.

1.1 Research problem

The supply and demand chain for Information Communication Technology (ICT) and digital talents in Malaysia remains unbalanced due to several factors, including the rapid evolution of technological trends, outdated educational curricula, and limited industry engagement (Azwa Abdul Aziz et al., 2022). Despite initiatives like the Industry-Academia Collaboration (IAC)

launched by MDEC in 2016, significant disconnects persist between the theoretical knowledge imparted by academic institutions and the practical skills required by industries (Shah et al., 2023).

A recent MSC Talents report by Azwa Abdul Aziz et al. (2022) revealed that the supply of ICT graduates continues to exceed the demand from ICT industries. Specifically, the report indicates that while Malaysia produces an increasing number of ICT-related graduates each year, 35% of employers reported difficulties in finding graduates with the necessary practical skills to meet their specific needs. This imbalance highlights the persistent challenge of skill gaps that prevent effective job placement and productivity in the workforce.

Moreover, research by Tan et al. (2022) shows that sectors within the creative industries, including multimedia, are particularly impacted by talent shortages. These sectors struggle to adopt new trends and technologies due to a lack of skilled professionals capable of embracing and integrating these advancements. In addition, government policies have not sufficiently addressed the evolving needs of the industry, further compounding the talent crisis. In creative industries, for instance, the lack of comprehensive policies to foster skill development and retraining has created barriers to growth, innovation, and sustainability.

This evolution necessitates that multimedia institutions continuously update their tools and methodologies to remain relevant and effective. The ability of academic institutions to simulate real-world media environments and professional practices is increasingly challenged, leading to a gap that leaves graduates ill-prepared for the workforce. This gap not only affects their immediate employability but also their long-term career growth and competitiveness on the global stage. The distribution of talent, or human capital, is a critical factor in economic geography, as highlighted by Husain et al. (2022).

1.2 Research gap and Significance of The Research

This study addresses the critical need for sustainable collaboration between government, industry, and academic institutions in Malaysia's multimedia sector. Its findings aim to guide

policymakers, industry leaders, and educators on how to better structure and sustain these partnerships to meet stakeholder needs.

By evaluating current Government-Industry-Academia Collaboration (GIAC) initiatives, the study will identify key factors for long-term success, including financial support, leadership, and engagement. These insights will help build stronger collaboration models that support the growth of Malaysia's multimedia industry.

One significant gap this study addresses is the misalignment between academic curricula and industry demands, a problem intensified by rapid technological advancements (UNESCO, 2023). The research will propose strategies to bridge this gap, ensuring that graduates are equipped with the practical skills required in the multimedia sector.

Additionally, the study examines barriers that limit the success of GIAC initiatives, including resource limitations, time constraints, and communication gaps. By addressing these challenges, the research aims to improve collaboration, contributing to a more robust talent pool for the industry.

This research contributes to an area that requires deeper exploration by offering a focused evaluation of the factors influencing the effectiveness and sustainability of GIAC initiatives within the multimedia field.

1.3 Research objectives

RO1) To evaluate the roles and contributions of government, industry leaders, and academia in sustaining Government-Industry-Academia Collaboration (GIAC) initiatives within the multimedia art industry, emphasizing long-term partnership support.

RO2) To assess the sustainability and effectiveness of GIAC initiatives in developing industry-ready talent, identifying gaps in current efforts, and proposing strategies for sustainable alignment with industry needs.

RO3) To identify challenges and barriers in implementing GIAC initiatives and propose solutions that enhance their sustainability and long-term impact on the multimedia sector.

1.4 Research Questions

The following are the research questions:

RQ1: What roles and contributions do government, industry leaders, and academia play in sustaining effective Government-Industry-Academia Collaboration (GIAC) within the multimedia art industry?

RQ2: How sustainable and effective are current GIAC initiatives in developing industry-ready talent, and what key strategies can enhance alignment between academic curricula and industry needs?

RQ3: What are the primary challenges to implementing sustainable GIAC initiatives, and what solutions can strengthen their long-term effectiveness and impact in the multimedia industry?

2 Literature Review

The multimedia industry is rapidly evolving, driven by technological advancements and the increasing demand for digital content in areas like gaming, animation, and visual effects. This shift has heightened the need for Government-Industry-Academia Collaborations (GIAC) to ensure academic programs align with industry needs, equipping students with the skills needed for a competitive job market.

This chapter reviews existing literature on GIAC within Malaysia's multimedia sector. It examines the challenges of implementing technology-driven education models like Education 5.0, and the role of policy frameworks in supporting collaboration between universities, industry, and government. Additionally, it discusses talent shortages, the skills gap between academia and industry, and the financial and technological barriers to adopting advanced learning technologies.

By analyzing studies and models like the Triple Helix Model of University-Industry-Government Relations (Etzkowitz & Leydesdorff, 2014), this chapter establishes a conceptual

foundation for the research. It identifies gaps in current studies and provides insights into best *practices for fostering effective, sustainable partnerships in the multimedia industry.*

2.1 Literature Review

Malaysia's higher education, driven by Education 5.0, seeks to align learning with industry needs, using personalized, tech-focused approaches. However, implementing advanced technologies like VR/AR and the Metaverse in education is costly and uneven, creating disparities among institutions (Ahmad et al., 2023). Financial constraints, along with a lack of infrastructure and trained educators, widen the digital divide, marginalizing students without access to advanced tools.

In Malaysia's multimedia and creative industries, talent shortages hinder growth. As noted by Tan et al. (2022), sectors like animation and digital content creation require tech-savvy professionals, but rapid tech changes outpace talent development. Without robust policy support, the government's role in addressing these gaps is limited, underscoring the need for stronger Government-Industry-Academia Collaboration (GIAC).

GIAC initiatives focus on bridging academia and industry by ensuring that academic programs align with industry demands, equipping students with hands-on experience that prepares them for the workforce. For example, the CEO@Faculty program (Azmi et al., 2021) has been instrumental in bringing industry leaders into academia to guide students through real-world, industry-relevant projects, enhancing their employability. Shah et al. (2023) similarly stress that structured internships and industry-led projects facilitate a smoother transition for students into the workforce by providing practical skills and bridging the gap between theoretical knowledge and industry requirements.

For these collaborations to be sustainable, government policies must actively incentivize such partnerships. Proposed initiatives include providing financial support through grants, tax breaks, and funding for industry-aligned training programs (Tan et al., 2022). Such policies would not only encourage long-term industry involvement but also ensure that

Malaysia's workforce remains competitive in the evolving multimedia landscape by continuously addressing skill mismatches and supporting industry-relevant education.

2.2 Key Findings Related to the Proposed Research Topic

Implementing Education 5.0 requires costly technologies like VR/AR devices and high-speed internet, making it challenging for institutions with limited budgets. Ahmad et al. (2023) note that these financial barriers slow down the integration of tech-enabled learning, delaying alignment with industry needs.

Malaysia's creative sector faces a talent gap due to misalignment between education and industry. Tan et al. (2022) suggests that GIACs should focus on aligning curricula with industry needs to close this gap.

Collaborations like the CEO@Faculty Programme bridge theoretical knowledge with practical skills, improving employability. Azmi et al. (2021) and Shah et al. (2023) emphasize the role of GIACs in updating curricula to meet industry demands.

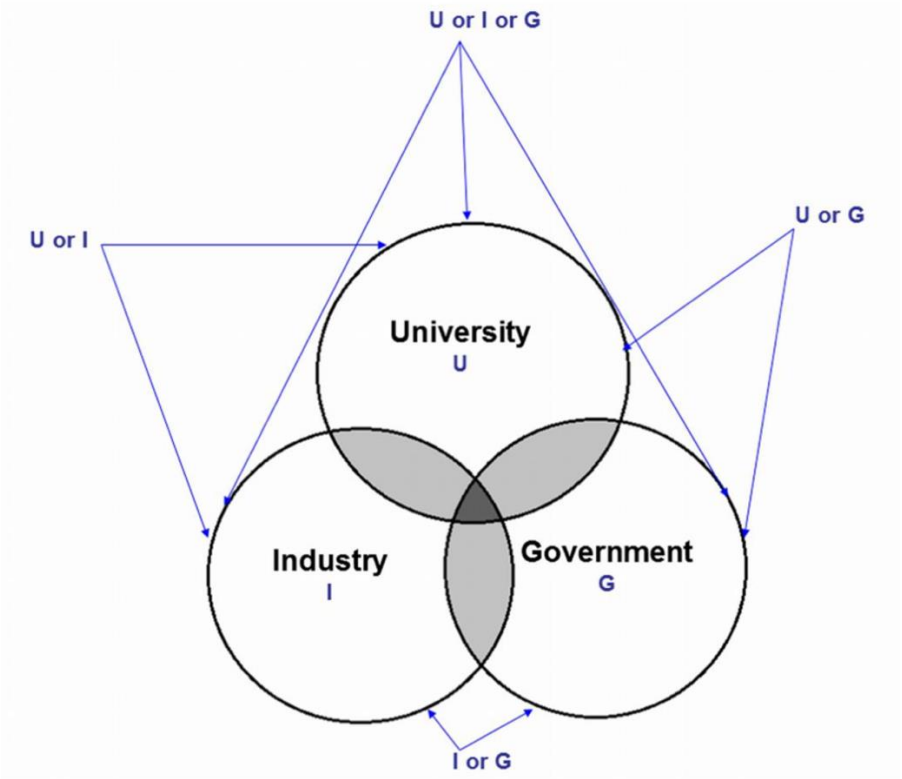
Tan et al. (2022) stress that weak government policies hinder long-term sustainability of GIACs, making it difficult for academic institutions to keep pace with multimedia industry advancements.

The digital divide, as noted by Ahmad et al. (2023), creates unequal access to advanced technologies. This gap must be addressed to ensure equal learning opportunities as GIACs push for tech-driven education.

2.3 The Triple Helix Model

Figure 1

The Triple Helix Model of University-Industry-Government Relations



Note. *Adapted from* The Triple Helix: University-Industry-Government Relations, *by H. Etzkowitz & L. Leydesdorff, 2014.*

The Triple Helix Model of University-Industry-Government Relations (Etzkowitz & Leydesdorff, 2014) underpins this study. It emphasizes the collaboration between universities, industry, and government to drive innovation, economic growth, and knowledge creation. In this model, universities produce human capital and innovation, industry applies this knowledge commercially, and the government provides the policies and regulations to support these efforts.

This collaboration creates an ecosystem of continuous innovation, benefiting sectors like Malaysia's multimedia industry. Universities contribute through research and

development, while industry transforms these findings into marketable products. The government ensures this partnership thrives by offering incentives, funding, and a conducive regulatory environment.

The Triple Helix Model fosters knowledge flow across sectors, ensuring ongoing curriculum updates, policy reforms, and industry advancements that drive mutual progress.

2.4 Theories underpinning the study

This study uses the Triple Helix Model to explore how Government-Industry-Academia Collaborations (GIAC) function in Malaysia's multimedia art sector, focusing on private colleges. The model emphasizes innovation through collaboration, with government, industry, and academia each playing a crucial role in supporting the multimedia industry's growth.

Private colleges are the key educational institutions in this context, responsible for developing graduates with the skills needed in the rapidly evolving multimedia industry. Their role is assessed by how well they align curricula with industry demands and foster partnerships that provide students with relevant, up-to-date training.

The multimedia industry, in turn, shapes academic programs by offering feedback and insights on required skills, contributing to curriculum updates, guest lectures, and internships. This ensures that students are prepared for real-world challenges and helps keep academic content relevant.

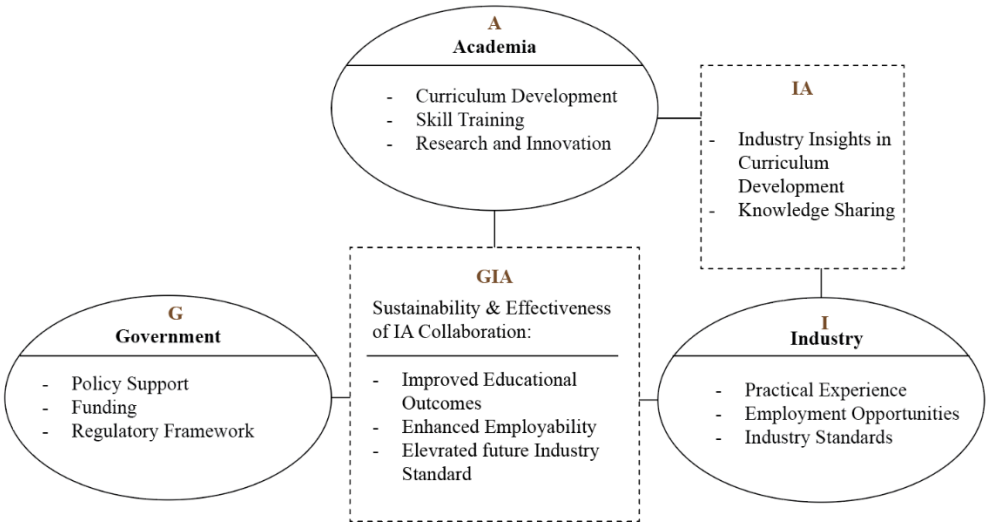
The government supports these collaborations by providing policy frameworks, funding, and incentives to strengthen the connection between colleges and the industry. Through this role, the government aligns the interests of academia and industry with national development goals, helping to drive Malaysia's economic and technological progress.

This research applies the Triple Helix Model to highlight the importance of ongoing collaboration between government, industry, and academia in ensuring the sustainability and growth of Malaysia's multimedia art industry.

2.5 Conceptual Framework

Figure 2

Conceptual Framework of Government-Industry-Academia Interactions in the Multimedia Sector



Note. This framework was developed by the author, building on the Triple Helix Model (Etzkowitz & Leydesdorff, 2014), to illustrate specific interactions within the multimedia sector.

This study, based on the Triple Helix Model, introduces a framework that highlights collaboration between government, industry, and academia in Malaysia's multimedia sector.

A key component is Curriculum Development and Skill Training, where industry and educational institutions work together to ensure curricula are aligned with the evolving needs of the multimedia industry. This keeps students well-prepared for the workforce.

Another important area is Research, Innovation, and Knowledge Sharing, where joint research between universities and industry fosters innovation and ensures academic programs stay current with industry trends.

The government supports this collaboration through Policy, Funding, and Regulation, creating a conducive environment for long-term partnerships. Incentives like tax breaks encourage active industry involvement in education and research.

The framework also focuses on Practical Experience and Employment Opportunities, where industry partners offer internships and training to provide students with real-world skills, ensuring graduates meet industry expectations.

Ultimately, this collaboration enhances educational standards and employability, contributing to the growth of Malaysia's multimedia sector and overall economic development.

3 Research methodology

This chapter explains the research design and methodology for studying Government-Industry-Academia Collaboration (GIAC) in Malaysia's multimedia industry. It focuses on assessing the sustainability, effectiveness, alignment between academic programs and industry needs, and the role of government policies.

A mixed-methods approach was used, incorporating both quantitative (surveys) and qualitative (focus groups, interviews) data collection methods. This ensured thorough data triangulation, offering a detailed view of GIAC challenges and opportunities.

The chapter also discusses the research design, sampling methods, data analysis, ethical considerations, and the limitations of the study.

3.1 Research Design

This research uses an Explanatory Sequential Case Study to assess the effectiveness of Government-Industry-Academia Collaboration (GIAC) in developing Malaysia's multimedia industry. It examines the roles of government, industry, and educational institutions, focusing on the sustainability of partnerships, alignment of educational programs with industry needs, and the impact of government policies.

The study begins with quantitative surveys to identify key trends, followed by qualitative interviews to provide deeper insights. This mixed-methods approach ensures a thorough exploration of the research problem, enhancing the validity and reliability of the findings through methodological triangulation.

3.2 Research Population and Sample

For this research, a stratified sampling technique was employed in the quantitative phase to ensure a diverse representation of stakeholders actively involved in Government-Industry-Academia Collaboration (GIAC) initiatives. This sampling approach included participants from three main groups: industry professionals, faculty members, and government officials, allowing for a balanced view of the GIAC landscape.

The initial pilot survey involved 30 respondents to test the survey instrument. Following this, the main survey expanded to include 65 participants, selected through stratified sampling to capture perspectives across the key stakeholder categories. This quantitative phase provided an overview of the effectiveness and challenges of GIAC initiatives, focusing on areas such as stakeholder roles, curriculum alignment with industry needs, and the sustainability of collaboration efforts.

In the qualitative phase, purposive sampling was used to select participants for focus groups and semi-structured interviews. The sample for the qualitative phase included:

1. 6 Industry Leaders: Chosen for their leadership roles and active engagement in talent development and collaboration initiatives within the multimedia industry.
2. 8 Faculty Members: Selected from both private and public institutions offering multimedia-related programs that actively partner with industry to align curricula with sector needs.
3. 2 Government Officials: Key representatives from relevant government agencies involved in policy formulation and sector support for the multimedia industry.

This dual-phase sampling strategy ensured comprehensive representation from all main stakeholders in GIAC initiatives, enabling a deeper exploration of both challenges and opportunities within Malaysia’s multimedia sector.

3.2 Data Collection Methods

3.2.1 Quantitative Data Collection (Survey Questionnaires)

The first phase of data collection involved distributing online survey questionnaires to industry professionals, faculty members, and government officials. These surveys aimed to gather initial insights into the effectiveness and challenges of current Government-Industry-Academia Collaboration (GIAC) initiatives. The questionnaire was adapted from previously used post-GIAC program surveys, focusing on key areas such as the roles of stakeholders, the alignment of academic curricula with industry needs, and the sustainability of collaboration efforts.

The survey instrument included both closed-ended and open-ended questions to capture quantitative ratings and qualitative feedback. Likert-scale items ranged from 1 (Strongly Disagree) to 5 (Strongly Agree), while open-ended questions allowed participants to elaborate on their responses. The questionnaire centered on three main focus areas, with four items in each area. Example open-ended questions included topics like stakeholder roles, the efficiency of collaborations, and strategies for improvement.

1) Perception of GIAC Roles:

No.	Items	1	2	3	4	5
1	The government's role is important in the development of the multimedia industry.					
2	Colleges play an important role in the development of the multimedia industry.					
3	The role of the industry is crucial in the development of the multimedia industry.					
4	Collaboration between government, colleges, and industry enhances the multimedia industry.					

Participants rated the significance of the roles played by government, industry, and academia (GIAC) in the collaborative initiatives. These questions focused on how each stakeholder contributes to achieving the goals of the partnership.

2) Effectiveness of GIAC Initiatives (5 questions):

No.	Items	1	2	3	4	5
1	The progress made in achieving the objective of nurturing higher-value talents for the industry is considered efficient.					
2	The current initiatives of the GIAC are sustainable.					
3	GIAC initiatives effectively address the skills gap in the multimedia industry.					
4	*The current academic curriculum effectively prepares students well for industry demands.*					

Respondents evaluated the effectiveness of GIAC initiatives in bridging the gap between educational programs and industry requirements. The questions aimed to determine how well these collaborations address skill gaps and industry demands.

3) Challenges and Strategic Proposals (2 questions):

No.	Items	1	2	3	4	5
1	The initiatives address the challenges of disconnection between education and industry effectively.					
2	Maintaining effective and continuous collaboration among government, colleges, and industry is challenging for the future of the multimedia industry.					
4	Government, industry, and colleges face challenges in participating in these initiatives.					
5	Supporting new initiatives aimed at fostering multimedia industry development is likely.					

The survey included open-ended questions where participants identified challenges related to the effectiveness and sustainability of GIAC initiatives. Additionally, respondents were

encouraged to provide suggestions and strategies for improving these collaborations to ensure long-term success.

Example survey questions open-ended questions included:

1) " What improvements would you suggest for the GIAC initiatives?"
2) “What are the main challenges faced by stakeholders in the GIAC initiatives?”
3) “What resources or support do you believe are necessary for successful collaborations?

3.2.2 Qualitative Data Collection (Focus group and semi structured interviews)

In the second phase, focus group discussion and semi-structured interviews were conducted to gain in-depth insights from key stakeholders. The interview questions were developed based on the survey results and aimed at exploring the following areas:

1) Sustainability of Collaborations: Understanding why current GIAC initiatives are not sustainable and identifying strategies to ensure long-term engagement.
2) Alignment Between Education and Industry Needs: Investigating the gap between academic curricula and industry requirements and proposing solutions to bridge this gap.
3) Role of Government in Supporting GIAC Initiatives: Exploring how government policies can enhance or inhibit collaboration between industry and academia.
4) Incentivization and Career Performance: Examining the impact of KPIs and performance metrics on industry participation in educational initiatives.
5) Challenges in Implementing Effective GIAC Initiatives: Identifying obstacles such as time constraints, resource limitations, and communication gaps between stakeholders.

Each focus group and semi structured interview lasted between 45 minutes to an hour, and all interviews were recorded and transcribed for analysis.

3.3 Data Analysis Techniques

3.3.1 Quantitative Data Analysis

The quantitative data analysis aimed to address each research question by utilizing descriptive statistics and cross-tabulations. Responses from the survey questionnaires were processed using

Microsoft Excel to calculate the mean, median, and mode for each question, which allowed for a summary of the general trends and patterns in stakeholders' perceptions.

For each research question:

- Research Question 1 (Evaluating the roles and contributions of stakeholders): Descriptive statistics were used to analyze responses regarding the roles of government, industry, and academia in GIAC initiatives. Mean and median scores provided insight into each stakeholder group's perceived contributions, while cross-tabulations enabled comparisons across groups to identify potential differences in their perspectives on responsibilities and roles.
- Research Question 2 (Analyzing the effectiveness of GIAC initiatives): Responses related to the effectiveness of GIAC in talent development and industry alignment were examined through mean scores and frequency distributions. By analyzing the distribution of responses for each effectiveness-related item, the study identified areas where initiatives were perceived as strong or lacking. Cross-tabulations were used to compare perceptions of effectiveness among industry leaders, academic faculty, and government officials.
- Research Question 3 (Identifying and addressing challenges): Likert-scale responses concerning challenges faced in implementing GIAC initiatives were summarized using mode and median values to understand the most frequently encountered issues. Cross-tabulations provided insights into which challenges were most significant for each stakeholder group, highlighting where perceptions of barriers differed among government, industry, and academia.

By structuring the analysis according to each research question, this approach facilitated a targeted examination of the survey data, helping to clarify the specific roles, effectiveness, and challenges associated with GIAC initiatives.

3.3.2 Qualitative Data Analysis

The analysis of quantitative data from closed-ended survey questions and qualitative data from open-ended questions was conducted using complementary methods to fully capture the insights provided by participants.

For the closed-ended questions, which were primarily Likert-scale items, responses were analyzed using descriptive statistics to identify trends and patterns in participant perspectives. Microsoft Excel was used to calculate measures such as mean, median, and mode for each question, providing a clear quantitative summary of the data. Additionally, cross-tabulations were employed to compare responses across different stakeholder groups, namely government, industry, and academia. This approach allowed for a deeper understanding of how each group perceives the roles, effectiveness, and challenges of Government-Industry-Academia Collaboration (GIAC) initiatives, highlighting any notable similarities or differences among them.

The open-ended responses were analyzed using thematic analysis, which allowed for a more nuanced exploration of participants' insights. This process began with an initial phase of familiarization, where the responses were read multiple times to gain an overall understanding of the content. Following this, initial codes were developed by highlighting key phrases and statements directly relevant to the research objectives, such as "sustainability challenges," "curriculum-industry misalignment," and "government policy impact." These codes were essential in identifying recurring topics and issues raised by participants.

Once the initial coding was complete, similar codes were grouped to form broader themes that encapsulated the main ideas expressed by the respondents. Each theme was then reviewed to ensure it accurately reflected the underlying data and was aligned with the research questions and objectives. In this way, themes such as the need for greater curriculum alignment with industry needs, financial and structural barriers to effective collaboration, and suggested strategies for enhancing GIAC sustainability were identified and defined. To maintain clarity, each theme was given a distinct label and description, facilitating a coherent and structured analysis.

Finally, the findings were written up by summarizing each theme and linking it back to the research questions, with relevant quotes from participants used to illustrate and support

the key points. This approach of combining descriptive statistics for closed-ended responses with thematic analysis for open-ended responses allowed for a comprehensive interpretation of the data. While quantitative results provided an overview of general trends, the qualitative insights from open-ended questions added depth and context, enabling a richer understanding of specific challenges and recommendations regarding the effectiveness and sustainability of GIAC initiatives.

3.4.1 Internal Validity

The internal validity of this study was enhanced by the use of both qualitative and quantitative methods, triangulating data from survey questionnaires and interviews. Factor analysis was performed on the pilot survey data to ensure that the survey instrument accurately measured the intended dimensions—government, industry, and academia collaboration. The results of the factor analysis supported the internal structure of the survey, identifying three clear factors that aligned with the theoretical framework of the Triple Helix Model. This confirmed that the survey questions effectively captured the constructs being studied, thereby enhancing the internal validity.

3.4.2 External Validity

The external validity, or generalizability, of the findings was enhanced by selecting participants from a range of roles and sectors within the multimedia industry. However, since this study focuses on the Malaysian context, the findings may not be fully generalizable to other countries without further adaptation.

3.4.3 Reliability

The reliability of the survey questionnaire was assessed through pilot testing and factor analysis. To determine the adequacy of the sample size and the appropriateness of factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were utilized:

- KMO Measure: 0.78
- Bartlett's Test of Sphericity: χ^2 (df = 45) = 225.67, $p < 0.001$

The KMO value of 0.78 suggests that the sample size was adequate for performing factor analysis, as values above 0.6 are generally acceptable. Furthermore, the significant result of Bartlett's Test of Sphericity ($p < 0.001$) indicates that the survey items were sufficiently correlated, justifying the application of factor analysis. Additionally, for the 13 items used in the survey, each individual item showed a KMO value above 0.7, further supporting the adequacy of the sample.

The factor analysis identified three distinct factors—government, industry, and academia—which together accounted for 80% of the total variance. This indicates that the survey instrument effectively captures the key dimensions of collaboration between these stakeholders. Moreover, internal consistency measures further demonstrated the reliability of the survey items, confirming that the questionnaire is a reliable tool for use in the full study.

3.5 Ethical Considerations

This research adhered to strict ethical standards to protect the rights and confidentiality of participants. Before the data collection process, all participants were provided with an informed consent form that outlined the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time. Anonymity was maintained by assigning codes to each participant and removing any identifying information from the survey responses and interview transcripts.

The study was approved by the Institutional Review Board at the SEGi, ensuring that all ethical guidelines were followed.

4 Discussion

This chapter provides a comprehensive summary of the findings from the study, discusses the implications of these results, and offers recommendations for future research and practice. The research aimed to evaluate the effectiveness, sustainability, and alignment of Government-Industry-Academia Collaboration (GIAC) initiatives in fostering talent development for Malaysia’s multimedia industry (Azmi et al., 2021). Through a combination of quantitative surveys and qualitative interviews with industry professionals, faculty members, and

government officials, this study has identified key challenges, opportunities, and strategies for improving GIAC initiatives.

4.1 Summary of Key Findings

This study reveals significant insights into the roles and challenges faced by government, industry, and academic institutions in sustaining Government-Industry-Academia Collaboration (GIAC) initiatives within Malaysia's multimedia sector. These collaborations are seen as essential for bridging the skills gap and aligning educational outcomes with the rapidly evolving needs of the industry. However, the research highlights key factors that limit the effectiveness and sustainability of these initiatives.

4.1.1 Roles and Contributions of Key Stakeholders

Each stakeholder—government, industry, and academia—plays a distinct yet interconnected role in GIAC initiatives, with each contribution essential to the success of these partnerships. The government is positioned as a primary enabler, tasked with creating supportive policies, financial backing, and incentives that foster collaboration. However, findings indicate that current government efforts are often insufficient. Both industry professionals and academic leaders expressed a need for stronger, long-term support, suggesting that government engagement must go beyond short-term programs to include sustainable financial models, clear policy guidelines, and performance-based incentives. For instance, providing tax breaks or grants linked to successful collaboration outcomes would encourage active and consistent participation from industry stakeholders.

Industry partners, in turn, are crucial for offering real-world perspectives and ensuring that academic programs are aligned with practical skills needed in the multimedia workforce. However, time constraints and a lack of structured performance incentives often hinder industry professionals from fully committing to these initiatives. Without tangible benefits or rewards—such as career advancement opportunities or measurable performance incentives—industry participation tends to be sporadic and difficult to sustain. This finding underscores the need for a structured rewards system, which could incentivize sustained industry engagement and enable these collaborations to bridge the gap between academic training and industry demands effectively.

Academia, specifically educational institutions offering multimedia-related programs, is responsible for producing job-ready graduates. Yet, this role is compromised by outdated curricula and a lack of industry exposure among faculty, making it difficult to equip students with the skills that meet current industry demands. Institutions face financial limitations that hinder their ability to update educational content regularly, engage in long-term partnerships, and provide the level of practical training required. These constraints significantly weaken academia's capacity to contribute to a talent pool that can support the fast-paced multimedia sector.

4.1.2 Challenges in Addressing the Skills Gap

The effectiveness of current GIAC initiatives is further compromised by a significant misalignment between educational content and industry needs. Industry leaders and academic representatives alike pointed out that many graduates are not equipped with the job-ready skills necessary to thrive in Malaysia's multimedia industry. This gap is largely due to curricula that fail to keep pace with the latest industry trends and technological advancements, leaving students underprepared for the workforce. Addressing this misalignment will require more collaborative curriculum development processes, where industry leaders provide continuous input on skills demand, ensuring that educational programs remain relevant and that graduates possess the competencies needed in the field.

The study also identified several structural and financial barriers that contribute to the short-term nature of many GIAC initiatives. With limited resources, both industry and academic institutions struggle to sustain these partnerships. The lack of consistent funding makes it challenging to implement long-term programs and achieve the continuity required for impactful collaboration. Without a sustainable financial model, these initiatives often fail to provide the comprehensive training and experience necessary for the development of a robust talent pool.

4.1.3 Barriers to Sustainable Collaboration and Proposed Solutions

The findings underscore several key barriers that hinder sustainable collaboration, particularly the absence of clear Key Performance Indicators (KPIs) and structured incentives tied to GIAC contributions. This lack of formal metrics discourages long-term engagement from industry partners, who may view their participation as a cost rather than a beneficial investment. Both

industry leaders and government officials acknowledged that without well-defined goals and incentives, it is difficult to maintain meaningful involvement in GIAC initiatives. Performance-based incentives, such as tax breaks, grants, or rewards for successful participation in joint projects, could encourage more substantial industry engagement. These incentives would make it easier for companies to justify their involvement in educational partnerships, thereby enhancing the longevity and impact of these collaborations.

Additionally, time constraints and communication gaps between stakeholders emerged as significant challenges. Industry professionals noted that balancing regular business operations with educational commitments is difficult, particularly without structured communication channels that facilitate alignment on shared goals and expectations. Academic leaders similarly reported challenges in maintaining ongoing dialogue with industry partners, which is crucial for aligning curriculum content with current skills demands. To address these issues, the establishment of regular advisory meetings or joint task forces was recommended. These structured communication channels would allow stakeholders to stay aligned on collaboration goals, improving the consistency and efficiency of joint efforts.

The study's findings suggest that for GIAC initiatives to truly support Malaysia's multimedia sector, there must be an intentional focus on sustainability. Strong leadership, a long-term vision, and dedicated policy incentives are essential to achieving this goal. By providing financial incentives and establishing clear KPIs, the government can encourage industry participation and ensure that these initiatives have the resources and direction needed for lasting impact. Simultaneously, enhancing curriculum alignment through continuous feedback from industry leaders and improving communication channels among stakeholders will allow for more effective training of a job-ready talent pool.

These findings highlight the importance of cohesive, sustained partnerships in developing Malaysia's multimedia industry and ensuring its competitiveness in the global market. With targeted improvements in policy support, curriculum relevance, and stakeholder alignment, GIAC initiatives have the potential to transform Malaysia into a leading hub for multimedia talent and innovation.

4.2 Discussion

This study highlights the key factors affecting the success of Government-Industry-Academia Collaborations (GIAC) in Malaysia's multimedia sector. Drawing from the Triple Helix theory—which emphasizes the interdependence of academia, industry, and government—this research explores how these stakeholders can create sustainable partnerships (Pinto & Fernandes, 2021). By evaluating feedback from industry professionals, academics, and government officials, several critical themes emerge that align with the core concepts of the Triple Helix model.

A recurring theme from the data was the need for strong leadership with a clear, long-term vision for GIAC initiatives. Short-term programs were seen as ineffective and unsustainable, often failing to yield significant, lasting impacts (Sozbilir, 2007). The government must play a central role in coordinating these collaborations and ensuring that they are provided with the necessary resources for long-term success. In the Triple Helix model, the government acts as a key enabler, creating policy frameworks and incentives to facilitate collaboration between academia and industry (Ye et al., 2013). The call for strong leadership and long-term vision reflects the necessity of sustained government involvement to balance the interests of academia and industry, ensuring that innovation and talent development are aligned with national goals. To realize the potential of GIAC initiatives, a dedicated leadership body or centralized framework should be appointed to oversee these collaborations. This body would align the efforts of industry, academia, and government, ensuring that there is long-term financial and policy support to foster innovation and address the dynamic needs of the multimedia industry.

The study also revealed a significant mismatch between academic curricula and the demands of the multimedia industry (Tan et al., 2022). Many academic programs struggle to keep pace with technological changes, resulting in graduates who lack the skills necessary to thrive in a fast-evolving industry. This misalignment highlights the need for greater cooperation between academic institutions and industry leaders to regularly update curricula. The Triple Helix theory emphasizes the importance of knowledge flow and interaction between universities (or colleges) and industry Etzkowitz and Loet Leydesdorff (2014). Through collaborative efforts, such as joint curriculum development and applied research projects, both

sectors can ensure that academic programs are in sync with industry requirements, thereby producing job-ready graduates. To address this gap, academic institutions must work closely with industry to regularly update their curricula, incorporating hands-on learning experiences and industry-recognized certifications. Continuous feedback from industry professionals is essential to maintaining the relevance of educational programs and ensuring that students acquire the practical skills required by employers.

Furthermore, the findings emphasize the critical role of government support in facilitating effective GIAC initiatives. However, many respondents noted that current government efforts are often short-term and insufficient to sustain meaningful collaborations. Long-term policies, funding mechanisms, and incentives are essential for fostering enduring partnerships between academia and industry. Within the Triple Helix framework, the government serves not only as a regulator but also as a catalyst for innovation, providing financial and policy incentives that encourage collaboration. In this study, the lack of sustained government support was seen as a barrier to the success of GIAC initiatives. The government should offer tax incentives, grants, and performance-based funding tied to specific metrics, such as successful collaboration and improved employability of graduates. Enhanced communication between government, industry, and academia is necessary to ensure that policies and funding structures are aligned with the needs of all stakeholders.

Another major challenge reported by industry professionals was the lack of clear Key Performance Indicators (KPIs) and tangible incentives for participating in GIAC initiatives (Leydesdorff et al., 2013). Without structured rewards, industry stakeholders are less likely to commit to long-term collaboration, especially when the financial benefits are unclear. The Triple Helix model underscores the need for incentives to encourage industry engagement in collaborative innovation. In the absence of clear KPIs and rewards, industry may view participation in GIAC initiatives as a cost rather than an investment. This lack of formal incentives reduces the likelihood of sustained industry involvement, hindering the overall success of the collaboration. To encourage deeper industry engagement, formalized incentives such as tax breaks, grants, or career advancement opportunities should be introduced. These incentives could be linked to measurable outcomes, such as the number of students hired or the

success of industry-academia joint projects, making it easier for industry professionals to justify their participation.

Time constraints and communication gaps between stakeholders also emerged as significant barriers to the effectiveness of GIAC initiatives (Tan et al., 2022). Industry professionals, in particular, noted that they often lack the time to engage in collaborative activities, while miscommunication between academia and industry leads to misaligned goals and expectations. The Triple Helix theory advocates for the creation of structured channels of communication to facilitate knowledge exchange between stakeholders. In this study, the lack of regular communication was seen as a major obstacle to effective collaboration. Continuous interaction is necessary to ensure that the goals of industry, academia, and government are aligned. To overcome these barriers, regular advisory meetings or joint task forces should be established to facilitate better communication and goal alignment. These meetings would ensure that industry and academic institutions remain on the same page, allowing for more efficient collaboration and quicker resolution of any challenges that may arise.

5. Recommendations and Conclusion

The recommendations proposed aim to enhance the effectiveness of Government-Industry-Academia Collaboration (GIAC) initiatives, building on the findings of the research (Pinto & Fernandes, 2021). One of the key suggestions is to establish a dedicated government leadership body. This centralized entity would be responsible for overseeing and coordinating GIAC initiatives, ensuring that they align with long-term national talent development strategies and meet industry demands.

Another recommendation involves implementing performance-based financial incentives. Government support for GIAC initiatives should be tied to measurable outcomes, such as increased employability or the success of collaborations in producing industry-relevant skills. Companies that demonstrate successful collaboration should receive incentives such as tax breaks or matching grants to encourage their continued participation.

Academic curricula should also be updated continuously (Salleh & Omar, 2013). Institutions should create regular feedback loops with industry professionals to ensure that

curricula are relevant and up-to-date. Incorporating practical, hands-on learning experiences, industry certifications, and real-world projects into academic programs will better prepare students for the demands of the multimedia industry.

To tackle the challenges of time constraints and miscommunication, structured communication channels need to be created (Salleh & Omar, 2013). Regular advisory meetings or joint task forces would help facilitate collaboration and ensure that the goals of both industry and academia are aligned.

Finally, formalized incentives should be introduced to encourage sustained industry participation in GIAC initiatives. These could include financial rewards or career recognition to motivate industry professionals to contribute meaningfully to talent development and collaborative efforts.

5.4 Limitations and Future Research

5.4.1 Limitations

While this study offers valuable insights into Government-Industry-Academia Collaboration (GIAC) in Malaysia's multimedia industry, some limitations must be acknowledged.

First, the research was limited to companies and institutions in the Klang Valley, which may not reflect the views of stakeholders in other regions. The challenges faced in areas with different industry and educational resources may differ, limiting the broader applicability of the findings.

Second, the study focused specifically on the multimedia sector. Other industries may have different collaboration dynamics and challenges, such as slower technology adoption or different policy needs, meaning the conclusions may not apply universally.

5.5.2 Future Research Directions

Expanding the Scope: Future research should include a wider range of industries and regions beyond the Klang Valley. Studying GIAC initiatives in sectors like manufacturing, engineering, and technology would provide a more complete view of the challenges and opportunities across Malaysia.

Investigating Formalized Incentives: Future studies should explore the role of performance-based incentives like tax breaks and subsidies in driving industry participation in

educational collaborations. Understanding how these incentives support long-term, impactful partnerships between industry and academia could help inform better policy frameworks.

By addressing these limitations and exploring new areas, future research can enhance the understanding of how to improve GIAC initiatives in Malaysia and beyond.

5.5 Conclusion

This study has highlighted the key factors influencing the success of Government-Industry-Academia Collaboration initiatives in Malaysia's multimedia industry. While there are significant challenges in terms of sustainability, alignment with industry needs, and incentivization, the findings indicate that with strong leadership, long-term vision, and structured support from the government, these collaborations can be strengthened to produce a skilled talent pool capable of competing in the global market. By addressing the challenges identified in this research and implementing the recommended strategies, Malaysia can position itself as a leader in multimedia talent development and industry innovation (Azwa Abdul Aziz et al., 2022).

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