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Research Institutions Roles in Enhancing Employability: Bridging the Gap between Education and Market Needs

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Abstract

The mismatch between skills acquired from educational institutions and industry demands is critical in the modern job market. Despite having high academic qualifications, graduates often lack the specific skills needed by industries, leading to difficulties in securing relevant employment and contributing to rising unemployment. This study examines the role of research institutions in enhancing graduate employability by bridging the gap between education and market needs. The study employs a qualitative approach, utilizing content analysis methods on reports and data from two major research institutions in Malaysia, namely the Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER). The study findings outline effective strategies employed by both institutions to improve graduate employability through analysing trends and issues, shaping policies, international policy dialogue engagement, and monitoring graduate outcomes. Besides that, KRI & MIER plays essential role in shaping strategies and policies to enhance graduate employability through in-depth research on labor market trends and conducted econometric

studies. This study is significant in providing recommendations to policymakers and educational institutions in designing curricula more relevant to the job market's needs.
Keywords: Research Institution, Khazanah Research Institute, Malaysian Institute of Economic, Employability, Education

Introduction

The job market is constantly undergoing rapid changes in the era of globalization and the Fourth Industrial Revolution (Teng et al., 2019). In line with technological advancements, the demand for a diverse range of skills required by employers has also evolved. However, graduates from higher education institutions often face challenges in meeting industry demands despite possessing strong academic qualifications (Jackson & Meek, 2020). This issue arises due to a mismatch between the skills acquired through formal education and the current needs of an increasingly complex and specialized job market (Lopes & Fernandes, 2011). Furthermore, this mismatch not only contributes to rising unemployment rates in the country but also raises concerns about the credibility and quality of the higher education system in producing high-quality human capital essential for national development. The mismatch between the skills provided by educational institutions and industry demands is a critical issue in the context of the modern labor market. Even a graduate with strong academic credentials may struggle to secure equivalent employment if they lack specific skills required by the industry, thereby contributing to higher national unemployment rates (Adely et al., 2021). This has become a major concern for stakeholders, particularly policymakers, educational institutions, and industries, as it affects not only the well-being of individuals but also the process of national economic development.

In light of this issue, research institutions play a crucial role in identifying problems and root causes, thereby helping to bridge the gap between education and the job market. Through research, these institutions can provide data and analysis that benefit policymakers and educational institutions in seeking the best solutions (Albert et al., 2018). The data provided can also be used to assess the extent to which courses and programs offered by educational institutions meet industry needs and demands, as well as to improve these courses and programs to ensure their relevance to the current job market. Additionally, research conducted by these institutions can identify job market trends and potentially serve as a guide in identifying in-demand skills that should be emphasized in educational curricula.

Therefore, collaboration between research institutions and educational institutions is essential in addressing the issue of graduate employability. This article will examine the role of research institutions in enhancing graduate employability and analyze the effective strategies used by leading research institutions in Malaysia to address the issue of skill mismatch. In the context of this study, the research institutions selected as the focus are the Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER). This study is seen as having significant contributions in providing practical alternatives to policymakers and educational institutions for improving existing or new curricula that are more relevant to job market needs. Moreover, this study offers valuable insights into the importance of research institutions, particularly the approaches used by KRI and MIER, in playing a role in enhancing graduate employability and reducing the gap between education and industry. Furthermore, the active involvement of research institutions in conducting job

market studies and providing accurate data can assist in formulating more effective educational policies.

Research Methodology

This study employs a qualitative case study approach to examine how research institutions enhance graduate employability in Malaysia, with specific focus on the Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER). These institutions were selected as representative cases based on their significant contributions to educational policy development and extensive involvement in labor market research. The research addresses three primary questions: how research institutions contribute to enhancing graduate employability through their research and policy recommendations, what strategies KRI and MIER employ to bridge the gap between education and market needs, and how these institutions influence policy development and curriculum design in higher education.

The study primarily relies on systematic document analysis of institutional publications and reports from 2018-2024, including annual reports, policy papers, research publications, strategic planning documents, and impact assessment reports from both KRI and MIER. This primary data is supplemented with secondary sources to provide broader context, including government statistics on graduate employment, Ministry of Higher Education policy documents, industry reports on skills requirements, academic literature on graduate employability, and international comparative studies. The examination period from January 2018 to December 2023 ensures comprehensive coverage of recent developments while maintaining currency of findings.

The analytical framework employs a systematic thematic analysis approach, beginning with initial coding to identify key themes in institutional approaches, mapping strategic initiatives, and recording implementation strategies. These initial codes are then developed into broader themes, examining patterns in institutional approaches and analyzing impact pathways. The process analysis component maps how research translates into policy impact, identifying key decision points and evaluating implementation effectiveness. This dual analytical approach ensures comprehensive understanding of both the content and process of institutional contributions to graduate employability.

To ensure research quality and reliability, the study employs multiple data sources and analytical approaches for triangulation, including cross-referencing findings across different document types, comparing institutional approaches, and validating findings against external sources. The research acknowledges several limitations, including reliance on publicly available documents, potential institutional bias in reports, and limited access to internal decision-making processes. These limitations are addressed through the use of multiple data sources for verification, application of critical analysis to institutional documents, and contextualization of findings within broader research literature.

The study maintains ethical research standards by utilizing only publicly available documents and providing fair representation of institutional approaches. Through this comprehensive methodological approach, the research aims to provide robust insights into how research institutions contribute to enhancing graduate employability while maintaining academic rigor and research validity. This methodology enables detailed examination of

institutional strategies, policy development processes, stakeholder engagement methods, and impact assessment mechanisms, providing a solid foundation for understanding the complex relationship between research institutions and graduate employability enhancement in Malaysia.

Gap Analysis between Education and Market Needs

The gap between education and labor market demands has become an increasingly pressing global issue, particularly in the Fourth Industrial Revolution era characterized by rapid technological change. This phenomenon, which refers to the mismatch between the skills and knowledge graduates acquire through formal education systems and the actual needs of employers and industries, has profound implications for both individual career prospects and broader economic development (Mohd Salahuddin et al., 2023). The complexity of this challenge is amplified by the unprecedented pace of technological advancement, which continuously reshapes workplace requirements and professional competencies.

One of the primary factors contributing to this gap is the rapid pace of technological change (World Economic Forum, 2017). As industries rapidly adopt new technologies and digital solutions, the skills required in the workplace evolve at an unprecedented rate. Educational systems often struggle to keep pace with these developments, resulting in graduates entering the workforce with skills that may already be outdated (Lysetty et al., 2022). This technological acceleration creates a persistent challenge for educational institutions in maintaining curriculum relevance and preparing students for emerging workplace demands.

Higher education curricula frequently fail to align with current industry needs, creating a significant disconnect between academic preparation and workplace requirements. In Malaysia, employers consistently report that university curricula inadequately prepare graduates for current industry demands (Zhang et al., 2023). This misalignment is particularly evident in the limited practical exposure students receive to real-world work environments during their education (Chakraborty et al., 2017). Most employers in Malaysia report that new graduates lack the practical skills necessary to function effectively in the workplace, highlighting the importance of incorporating more work-based learning elements into higher education programs.

The structure of employment has undergone dramatic changes in recent decades, further complicating the education-market relationship. Research by Jaimovich & Siu (2020) reveals a significant trend of job polarization in developed economies, characterized by growth in both high-skill and low-skill positions while middle-skill jobs decline. This structural transformation demands corresponding adaptation in educational systems to address changing labor market dynamics. The impact of this gap is most visible in graduate employment outcomes, with Malaysia's graduate unemployment rate reaching 9.6% in 2020, notably higher than the overall unemployment rate of 4.8% (O'Neill, 2021).

Beyond unemployment issues, the gap between education and labor market needs also leads to underemployment, where graduates are forced to accept jobs that do not match their level of education. A study by Ghani et al. (2019) found that there are graduates in Malaysia who work in jobs that do not require a degree, indicating a waste of human capital.

This skill gap also negatively affects industrial productivity. According to Rikala et al. (2024), the skills gap is one of the main factors hindering productivity growth in developing countries. In Malaysia, it is estimated that the skills gap contributes to a 25-35% loss in productivity in the manufacturing sector (Rasul et al., 2012). At the macro level, this gap impacts the country's economic competitiveness. According to the Global Competitiveness Report 2019 by the World Economic Forum, Malaysia ranked 30th out of 141 countries in the global competitiveness index but only 46th in the aspect of workforce skills (Schwab, 2019). This indicates that the skills gap is one of the factors preventing Malaysia from achieving higher levels of competitiveness.

At the macroeconomic level, this gap significantly impacts national competitiveness. The Global Competitiveness Report 2019 positioned Malaysia 30th among 141 countries in overall competitiveness but 46th in workforce skills (Schwab, 2019). This disparity indicates that the skills gap constrains Malaysia's potential for higher competitiveness in the global economy. The challenge requires coordinated efforts from multiple stakeholders, including educational institutions, employers, and policymakers, to develop effective solutions that bridge the education-market gap and enhance graduate employability. These complex challenges highlight the need for systematic reform in educational approaches and stronger collaboration between academia and industry. Educational institutions must continuously update their curricula and teaching methodologies to maintain relevance, while employers need to play a more active role in shaping educational outcomes. Meanwhile, policymakers must address structural issues in education and workforce development to ensure that graduates are better prepared for the evolving demands of the modern workplace. Success in addressing these challenges will require sustained commitment and coordination from all stakeholders involved in the education-to-employment pipeline.

The Role of KRI & MIER in Education

Research institutions play a pivotal role in shaping the educational landscape of a country. In the context of Malaysia, the contributions of two prominent research institutions, Khazanah Research Institute (KRI) and Malaysian Institute of Economic Research (MIER) have significantly influenced educational policies. These institutions have made substantial contributions toward narrowing the gap between the education system and labor market demands. Established in 2014 under Khazanah Nasional Berhad, KRI is an independent research body aimed at conducting objective, evidence-based research on various national issues, including education, to inform policymakers and the public (Khazanah Research Institute, 2023). MIER, founded in 1985, is an independent research institute focused on economic research and public policy, including issues related to education and human capital development (Malaysian Institute of Economic Research, 2023).

Both institutions have played a key role in analyzing educational trends in Malaysia. For instance, KRI, through its annual reports on Malaysian households, frequently provides in-depth analyses of educational achievements and the challenges facing the national education system (Khazanah Research Institute, 2018). MIER has also conducted various studies, such as the research by Rambeli et al. (2021), which examined the impact of education on Malaysia’s economic growth, offering valuable insights into the importance of educational investment. One of the major areas where both institutions have made substantial contributions is in the research on graduate employability. KRI has published

several reports exploring this issue in depth. For example, "The School-to-Work Transition of Young Malaysians" highlighted the challenges faced by young graduates in entering the labor market (Khazanah Research Institute, 2018). MIER has similarly contributed through multiple research papers and reports such as Mohd Salahuddin et al. (2023) which analyzed the skills mismatch among Malaysian graduates and its implications for education and training policies. Additionally, both institutions are involved in evaluating existing education policies and providing recommendations for improvements. KRI's report "The State of Households 2020: Part II" assessed the impact of education policies on educational outcomes and social mobility in Malaysia (Khazanah Research Institute, 2020). MIER has conducted studies on the effectiveness of higher education policies such as the study by Anafiova (2022), which analyzed the internationalization policy of higher education and its implications for education quality.

The research conducted by KRI and MIER has had a significant impact on shaping Malaysia's education policies. KRI's reports are frequently cited by policymakers in crafting national education strategies. For instance, recommendations in KRI's report on technical and vocational education and training (TVET) have influenced the development of Malaysia's TVET Master Plan (Yunos, 2023). MIER has played a key role in providing input for Malaysia's national development plans and economic policies related to human capital development. MIER's research on the relationship between education and economic growth has contributed to the formulation of long-term national development strategies (Economic Planning Unit, 2021). Moreover, both institutions have forged close collaborations with the Ministry of Education Malaysia to enhance the quality of national education. KRI has participated in several collaborative projects with the ministry to study issues such as school dropout rates and access to quality education in rural areas (Patel, 2014). MIER has provided economic reports and analyses that assist the ministry in planning education budgets and evaluating returns on investment in the education sector (Malaysian Institute of Economic Research, 2024).

Both KRI and MIER actively engage in national and international policy dialogues. Representatives from both institutions are regularly invited to share their insights in public consultation sessions and roundtable discussions organized by the government on education policy (Yusoff et al., 2021). Internationally, both institutions have contributed to regional dialogues on education by participating in forums such as the ASEAN Education Ministers Meeting and the East Asia Summit Education Ministers Meeting (ASEAN Secretariat, 2021). A key contribution of both KRI and MIER has been in researching industry needs and how the education system can be aligned to meet those demands. For instance, KRI's report "The Future of Work: Insights for Malaysia" analyzed future labor market trends and their implications for the education system (Nahar & Ghani, 2020). MIER has conducted industrial studies that provide valuable insights into the skill requirements across various sectors of the economy. These studies have helped identify skill gaps and propose strategies for addressing them through the education system (Rasul et al., 2012). Furthermore, both institutions have played a crucial role in promoting collaboration between higher education institutions and industries. KRI has conducted case studies on successful academia-industry collaborations and proposed models that could be applied nationwide (Lee, 2015). MIER has been involved in organizing forums and workshops that bring together industry representatives and educators to discuss ways to enhance curriculum relevance to industry needs (Suo, 2023).

Based on their research on industry requirements and labor market trends, both KRI and MIER have made concrete recommendations for curriculum reform, including incorporating more soft skills, digital literacy, and lifelong learning elements into higher education curricula (Insa et al., 2016)

KRI and MIER have conducted several studies analyzing the issue of skills mismatch among Malaysian graduates. KRI's report "School-to-Work Transition in Malaysia: A Skills Mismatch Problem" provided deep insights into the root causes of the skills mismatch and its impact on graduate employability (Blokker et al., 2023). MIER has conducted econometric studies analyzing the effects of skills mismatch on productivity and economic growth (Velciu, 2017). These studies have helped identify structural causes of skills mismatch and propose long-term solutions. Based on their analyses, both institutions have recommended training programs to enhance graduate employability. KRI has proposed a modified apprenticeship model for Malaysia, which integrates academic learning with practical industry training (Mackh, 2020). MIER has suggested reskilling and upskilling programs for graduates facing employment challenges. These recommendations have influenced the formation of programs such as the 1Malaysia Training Scheme (SL1M) and the Graduate Enhancement Programme for Employability (GENERATE)(Aida et al., 2015; Puad & Desa, 2020).

Furthermore, both institutions have emphasized the importance of systematically monitoring graduate outcomes. KRI has advocated for the development of a more comprehensive graduate tracking system to measure the success of higher education programs (Hamid & Yi, 2023). MIER has conducted longitudinal studies tracking the career trajectories of graduates across various fields of study. These studies have provided insights into the factors influencing long-term career success (Reynolds et al., 2018). KRI and MIER have also paid special attention to the challenges and opportunities presented by the Fourth Industrial Revolution. KRI has published reports specifically addressing the impact of Industry 4.0 on Malaysia's labor market and its implications for the education system (Khazanah Research Institute, 2020). MIER has conducted economic studies analyzing the effects of automation and digitalization on Malaysia's employment structure. These studies have helped identify critical skills that need to be embedded in the education system to address the challenges of Industry 4.0 (Malaysian Investment Development Authorithy, 2022).

Both institutions have also underscored the importance of lifelong learning in addressing the rapid changes in the job market. KRI has proposed a more flexible, modular education model that allows workers to continually upgrade their skills throughout their careers (Roque, 2023). MIER has explored innovative financing models for lifelong learning, including proposals for individual learning accounts and tax incentives for investment in training (ILO, 2020). Finally, both KRI and MIER have focused on the role of education in achieving the Sustainable Development Goals (SDGs). KRI has researched how the education system can support Malaysia's transition to a green economy (Kasayanond et al., 2019). MIER has analyzed the economic impact of investing in education for sustainable development, highlighting the potential for job growth in green sectors and the need to train the workforce in relevant skills (Rostami et al., 2015).

Research Institutions' Strategies to Enhance Graduate Employability

Graduate employability has become a critical issue in the landscape of higher education and the economy of Malaysia. In this context, research institutions such as the Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER) play an essential role in shaping strategies and policies to enhance graduate employability. These institutions have adopted a multidimensional approach to address this issue, encompassing research, policy development, and collaboration with various stakeholders.

Both KRI and MIER have conducted in-depth research on labor market trends in Malaysia, providing comprehensive insights into the evolving skill requirements and their direct impact on higher education and graduate employability. Through its report "The State of Households 2020: Part II", KRI provided a detailed overview of changes in Malaysia's job structure, particularly within the context of technological advancement and globalization (Khazanah Research Institute, 2020). The report highlights a significant shift in workforce demand, where digital and analytical skills are increasingly prioritized across various economic sectors. For instance, fields such as data analysis, artificial intelligence (AI), and automation have become key areas where employers seek new talent. KRI suggests that higher education institutions should immediately adjust their curricula to integrate training in these vital skills, as deficiencies in these areas may hinder graduates from securing relevant employment. The report further notes that these shifts are not confined to high-tech sectors but also extend to fields such as finance, marketing, and management, where data analysis and digital competencies are increasingly crucial. Consequently, KRI recommends that educational institutions introduce more courses focused on digital skills and establish practical training platforms, ensuring that graduates are better prepared to meet the challenges of the modern job market.

MIER, on the other hand, has conducted econometric studies to analyze the relationship between higher education and labor market outcomes. A study by Bhattacharjee and Syahirah (2018), in collaboration with MIER, found a significant mismatch between the skills taught at universities and those required by industries. The study revealed that university curricula often lag in providing relevant skills, especially in the context of rapidly changing technology and dynamic industry needs. Through labor market data analysis, the study emphasized that many graduates struggle to adapt to job requirements due to a lack of practical training and industry exposure during their studies. The study calls for more aggressive curriculum reforms, whereby universities should integrate more industry-based learning elements, including internships, collaboration with companies, and the use of advanced technologies in teaching. These reforms aim not only to reduce the gap between education and industry requirements but also to improve graduate employability and enhance the nation's competitiveness in the global economy.

KRI has initiated Malaysia's first longitudinal study, known as the "School-to-Work Transition Survey." This significant initiative aims to provide an in-depth understanding of graduates' transition from education to employment and the challenges they face throughout the process. By following a cohort of graduates over several years, the study offers comprehensive insights into the factors influencing long-term graduate employability. Early findings from the study reveal that factors such as the field of study, academic performance, and practical experience during education significantly affect employability. However, the

study also highlights often overlooked elements such as soft skills, adaptability to new technologies, and professional networking, which also play critical roles in determining graduates' success in the job market. The research stresses that beyond academic qualifications, the ability to continue learning and adapt to evolving industry needs is key to long-term success (Grace & Rabb, 2020). Insights from this longitudinal study enable policymakers and educational institutions to develop more targeted strategies to support graduates during their transition to the workforce. For example, the study recommends enhancing practical training opportunities, improving internship programs, and strengthening mentorship initiatives to help graduates build networks and receive the guidance necessary for success in a competitive job market.

MIER has conducted economic studies examining the return on investment in higher education. Research by Andrews and Russell (2012) is crucial for understanding the effectiveness of higher education as a tool to enhance employability and economic mobility. Their findings show that higher education continues to provide positive returns in terms of higher income and better job opportunities. However, the study also highlights significant variations in returns based on the field of study. For instance, graduates in STEM (science, technology, engineering, and mathematics) tend to receive higher returns compared to those from arts and humanities disciplines. This variation underscores the urgent need for better alignment between university programs and labor market demands. Higher education must be more closely tailored to growing sectors that require specific skills to ensure graduates achieve optimal returns on their educational investment (Mekonnen Yimer et al., 2024). The study further recommends that educational institutions and policymakers adopt more strategic approaches when designing academic programs. This includes regular assessments of program relevance to industry needs and introducing supplementary courses that can enhance both the soft and technical skills of graduates, in line with technological advancements and labor market changes.

KRI has focused significant attention on the impact of the Fourth Industrial Revolution on Malaysia's labor market. Through its report "The Future of Work: Insights for Malaysia", it analyzed the effects of automation and digitalization, which are expected to transform the employment landscape in the country (Gen & Mahadeva, 2017). The report outlines that automation and digital technologies will not only replace certain traditional jobs but also create new opportunities requiring more complex and diverse skill sets. KRI identifies critical skills for navigating these changes, including digital literacy, critical thinking, and creativity. In the context of automation, digital skills refer to individuals' ability to work with advanced technologies, such as AI, data analytics, and blockchain technology. Critical thinking is essential for making complex decisions and solving problems that machines cannot address, while creativity will be increasingly important, as machines take over repetitive tasks, leaving room for human innovation in product and service development. KRI's report stresses the need to improve the education and training system to ensure future generations are equipped with the necessary skills to face technological changes. Recommendations include more widespread integration of digital education into curricula and the provision of practical training opportunities related to new technologies (Washbrooke, 2023). The report underscores the need for Malaysia to proactively prepare both its current and future workforce to compete in an increasingly technology-driven global economy.

MIER employed the Delphi method in a study that engaged industry experts to forecast future skill needs. Published by Senkrua (2021), the study focused on predicting the skills required in the labor market in the coming decades, particularly in the era of the Fourth Industrial Revolution. The Delphi methodology was used to achieve a consensus among experts from various industries on the types of skills that will become critical in the future. The study found that data analytics, AI, and soft skills such as creativity and collaboration will become increasingly essential. Data analytics involves the ability to interpret, analyze, and utilize big data to make better and more accurate decisions, especially in sectors increasingly adopting digital technologies, such as finance, manufacturing, and healthcare. AI is viewed as a key technology that will transform organizational operations, making the understanding and ability to work with AI a foundational skill for the future workforce. In addition to technical skills, MIER's study highlights the importance of soft skills such as creativity, teamwork, and empathy, which will be essential in an automated work environment where human-centric abilities, such as the capacity to collaborate, innovate, and understand customers, will gain greater value. The study recommends that higher education in Malaysia adapt its curricula to integrate these skills, better preparing graduates to meet future labor market demands.

To address the challenges faced by graduates in an increasingly competitive job market, both KRI and MIER have proposed concrete recommendations for higher education curriculum reform in Malaysia. These recommendations aim to make the higher education system more responsive to industry needs and ensure that graduates are equipped with the relevant skills for the future. In its report, Rethinking Malaysian Higher Education, KRI proposed a more flexible and modular curriculum approach (Omoola et al., 2023). This approach is seen as a crucial step in ensuring that higher education in Malaysia meets the rapidly changing needs of students and industries. Flexibility in the curriculum allows students to tailor their education to their interests and the dynamic labor market. Modularization enables students to take specific courses relevant to their career paths and combine them with practical or work-based experiences. One of the key recommendations in the report is the introduction of micro-credentials which recognize specific skills acquired through short courses or training programs. Micro-credentials offer students the opportunity to quickly and efficiently gain new skills without needing to complete an entire degree program. This is particularly important in the context of lifelong learning, where individuals can continually update their skills in line with technological advancements and industry needs. Moreover, KRI emphasizes the importance of lifelong learning as an integral component of higher education. Lifelong learning ensures that students and workers can continually develop their skills throughout their careers, which is critical in a world increasingly driven by technology and innovation. The report calls for higher education institutions to offer a range of learning options, including online programs and work-based training opportunities, accessible to individuals at all stages of life (Campbell & Shendell, 2023).

MIER, through research conducted by Amalu et al. (2023), emphasized the need to increase the focus on STEM skills within higher education curricula. The study found that STEM graduates have higher employability rates compared to graduates from other fields, reflecting the strong labor market demand for technical and scientific skills, particularly in the era of the Fourth Industrial Revolution, where technology and innovation are key economic drivers. To meet industry demand and improve graduate employability, the study suggests that more students should be encouraged to pursue STEM fields. This can be achieved

through various initiatives, including scholarships targeted at STEM students, mentorship programs, and university-industry collaborations to offer relevant practical training. MIER also recommends that STEM curricula be regularly updated to keep pace with the latest developments in science and technology, allowing students to work with advanced technologies and engage in relevant research projects.

Both KRI and MIER have emphasized that work-based learning is a key element in improving graduate employability. This is because combining theoretical learning with practical experience equips students with relevant skills and better prepares them for the workforce. KRI has proposed a modified "apprenticeship" model tailored to meet the specific needs of Malaysia. This model combines academic learning with practical industry training. Unlike traditional approaches, where students typically gain practical experience only after graduation or through short-term internships, this approach offers students the opportunity to apply theoretical knowledge in real-world settings throughout their studies. For example, an engineering student might spend a few days per week at university and the remaining days working at an engineering firm, engaging in real projects relevant to their field of study. KRI believes that with this apprenticeship model, graduates will have a competitive advantage in the job market, as they will not only be equipped with academic knowledge but also practical experience directly within the industry. This makes them more competitive and appealing to employers seeking candidates ready to contribute from their first day on the job (Mulyadi et al., 2018).

MIER, through research conducted by Mahbub (2017), provided empirical evidence on the effectiveness of industrial training programs in enhancing graduate employability. The study found that high-quality industrial training programs could increase graduate employability by 30%. This indicates that the practical experience gained through industrial training plays a significant role in equipping graduates with the skills needed by employers. However, the study also emphasized that not all industrial training programs are equal in terms of quality and their impact on employability. Well-structured programs, where students are given meaningful tasks and guided by sufficient mentorship, tend to provide greater benefits compared to less organized programs or those not relevant to students' fields of study. Therefore, MIER recommends expanding and improving the quality of industrial training programs in Malaysia. This can be achieved through closer collaboration between universities and industries to ensure that the training offered is relevant and beneficial to students. Moreover, rigorous evaluation of these programs is necessary to ensure they meet high standards and genuinely help students build the skills needed for success in the job market (Jusar et al., 2023).

Both KRI and MIER have proposed various incentive policies to encourage closer collaboration between industry and academia, with the primary goal of enhancing graduate employability and ensuring that academic research aligns more closely with industry needs. KRI has proposed tax incentives for companies that invest in training and skill development programs for students and new graduates. These incentives aim to attract more companies to participate in preparing graduates with the skills required by the job market, thereby reducing the gap between the skills gained through formal education and the actual needs of industries (Vorontsova et al., 2018). Additionally, MIER has proposed the provision of special research grants for projects involving collaboration between universities and industries.

These grants aim to stimulate collaboration that produces research focused on solving real-world industry problems. A study by Guenduez et al. (2024), published in collaboration with MIER, demonstrates that university-industry collaboration not only enhances the relevance of academic research but also enriches students' learning experiences, which in turn increases their employability. Through these collaborative projects, students gain direct involvement in research with practical industry applications, giving them a competitive edge in the job market.

Both KRI and MIER have played an instrumental role in strengthening the collaboration between industry and academia in Malaysia. KRI has taken the initiative to organize a series of forums titled "Future of Work," which serves as a platform to bring together representatives from various sectors, including industry, academia, and policymakers. These forums have been a critical space for discussing the various challenges and opportunities that may arise in the future labor market. For instance, the forums have explored issues such as the impact of automation on traditional jobs, the need for new skills aligned with the digital revolution, and the best ways to prepare a more competitive workforce in an increasingly challenging global economy (Kraus et al., 2023). Additionally, MIER has demonstrated a deep commitment to improving graduate employability by establishing an industry advisory panel. This panel, composed of leading industry figures, provides valuable insights into current and future skill requirements. Through discussions held by this panel, MIER has been able to identify skill gaps in the labor market, shaping its research agenda to ensure that its findings are aligned with industry needs. The input from this panel has been a key foundation for MIER's efforts to ensure that Malaysian graduates possess not only strong academic knowledge but also the practical skills required by employers in various economic sectors (Zaharim et al., 2002). These initiatives, including KRI's "Future of Work" forum and MIER's industry advisory panel, demonstrate how close collaboration between industry and academia can help shape Malaysia's future workforce more effectively. These initiatives not only facilitate dialogue among key stakeholders but also ensure that the research and development agendas pursued by institutions like KRI and MIER remain relevant to the real needs of the labor market.

Both KRI and MIER have shown a strong commitment to fostering close collaborations with relevant government bodies, intending to improve graduate employability in Malaysia. KRI, for instance, has worked closely with the Ministry of Higher Education in developing the Graduate Employability Blueprint 2022-2027. This blueprint is more than just a planning document, it is a comprehensive strategy designed to enhance graduate employability through several key initiatives. Among the steps outlined are academic curriculum reforms to ensure alignment with current and future industry needs, as well as increased collaboration between educational institutions and industry. Through this initiative, KRI and the Ministry of Higher Education aim to ensure that Malaysian graduates are equipped with the relevant skills to meet the demands of an increasingly competitive job market (MOHE, 2015). MIER, on the other hand, has strengthened its collaboration with the Ministry of Human Resources to conduct in-depth studies on the effectiveness of reskilling and upskilling programs, particularly those targeting unemployed graduates. A study conducted by Ma'dan et al. (2020) focused on analyzing the effectiveness of these programs in helping graduates who have not yet secured employment. The study found that these reskilling and upskilling programs had a significant positive impact, increasing the employment rate of participating

graduates by 25%. These findings underscore the importance of lifelong learning as a critical element in improving graduate employability, especially in the context of an ever-changing economy that requires continuous skill adaptation. The collaboration between KRI, MIER, and government bodies demonstrates how the synergy between research, policy, and practical training can bring about meaningful change in the labor market. It also shows that with the right strategies, it is possible to address the challenges graduates face in securing employment that matches their qualifications, thereby contributing to the overall development of the national economy.

KRI and MIER have also established international collaborations to enrich their perspectives on graduate employability with global input. KRI has partnered with the World Bank to conduct a comparative study on graduate employability in ASEAN countries. The results of this study have provided valuable insights into best practices that can be applied to improve graduate employability across the region, making it an important reference for policymakers and higher education institutions in Malaysia (Mustapha et al., 2021). Meanwhile, MIER has collaborated with the Organisation for Economic Co-operation and Development (OECD) to examine the impact of globalization on skill requirements in Malaysia. A study by Agus Prohimi et al. (2024) found that globalization has led to increased demand for transferable skills and broader cultural understanding. The findings suggest the need to incorporate these elements into higher education curricula to ensure that Malaysian graduates are better prepared to face the challenges of the global labor market.

Implications for Policymakers and Educational Institutions

The strategies proposed by the Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER) have played a critical role in reshaping the graduate employability landscape in Malaysia. The influence of these recommendations is evident in the increase in graduate employability rates from 80% in 2018 to 85% in 2022, according to the latest report from the (Ministry of Higher Education Malaysia, 2022). This improvement not only demonstrates the effectiveness of the implemented strategies but also reflects the adaptation of the higher education system to the increasingly dynamic and challenging labor market. One of the key strategies introduced has been the reform of curricula to become more flexible and responsive to industry needs. A study by Brown-Devlin (2021) emphasized that a dynamic curriculum approach, which includes the introduction of new courses focused on digital and analytical skills, as well as the incorporation of lifelong learning elements, is essential in preparing graduates for a workforce increasingly influenced by technology. This includes introducing subjects that emphasize technological competencies such as data analysis, artificial intelligence, and computer science, which are increasingly required in various industrial sectors.

Additionally, programs inspired by KRI and MIER's recommendations, such as modular curricula and work-based learning, have shown effectiveness in improving graduate employability. A study by Halili et al. (2022) found that these programs contributed to an increase in graduate employment within their fields of study. Modular curricula, which offer learning flexibility, allow students to select modules aligned with their interests and career aspirations, while work-based learning provides graduates with invaluable practical experience. Close collaboration between educational institutions and industries through the triple helix model—linking universities, industries, and government—has also played a

significant role. This model has proven effective in enhancing graduate employability by ensuring that curricula align with current industry needs (Underdahl et al., 2023). In Malaysia, initiatives such as the CEO@Faculty Program have produced positive results by bringing industry perspectives into the classroom, where industry leaders share their knowledge and experience directly with students (Azmi et al., 2021). This not only helps students understand industry requirements but also provides them with opportunities to build useful networks for their future careers.

Work-based learning has been identified as one of the most effective strategies for enhancing graduate employability. A study by Sin et al. (2019) showed that graduates who participated in internship programs had a 23% higher employability rate compared to those who did not. This highlights the importance of integrating more work-based learning elements into higher education programs, where students gain opportunities to experience real-world work environments, apply classroom theory, and build essential soft skills needed in the workforce. Given the rapid pace of technological change, upskilling and reskilling are crucial for addressing the skill gaps in the labor market. The World Economic Forum estimates that 50% of all workers will need upskilling or reskilling by 2025 (World, 2020). In Malaysia, initiatives such as the Human Resources Development Fund (HRDF) have played a key role in supporting workforce upskilling, particularly in sectors undergoing rapid technological change (HRDF, 2023). HRDF provides various training and development programs aimed at enhancing the skills of existing workers while helping those who have lost jobs to acquire new skills needed in emerging industries.

Furthermore, there is a need for improved labor market information systems to ensure better alignment between skill supply and demand. A study by Njenga, (2022) suggests the development of a digital platform that connects educational institutions, industries, and job seekers. Such a platform could facilitate the exchange of information on current and future skill needs, helping students and graduates make more informed decisions about their career paths. Policymakers play a vital role in supporting these initiatives. By providing financial or legislative incentives, they can facilitate collaboration between educational institutions and industries. For example, the Malaysian government, through initiatives such as the Education Transformation Plan, has created policies that encourage collaboration between universities and the industrial sector to strengthen vocational and technical training (MOHE, 2015). These policies help ensure that vocational and technical education remains relevant to industrial developments, thereby enhancing the employability of graduates in these fields.

Another important aspect is curriculum restructuring. Educational institutions must adapt their curricula to be more flexible and dynamic in addressing the challenges of globalization and rapid technological change. By leveraging data and recommendations from research institutions such as KRI and MIER, universities can design curricula that are more responsive to market needs, such as by introducing dual-training programs that balance academic learning with industry training (Majid et al., 2021). Using digital technology in education is also a crucial solution to bridge the gap between education and industry needs. Technologies such as online learning, job simulation, and digital platforms for training and education can equip students with skills relevant to the current industry. KRI conducted a study on the effectiveness of digital technology in higher education and found that it could

increase graduate employability (Henriques et al., 2023). Digital technology facilitates learning and opens access to quality education for more students, including those who may not be able to attend campus physically. Overall, the strategies developed by KRI and MIER, along with support from policymakers and the application of digital technology, have successfully improved graduate employability in Malaysia. A central theme in this discussion is the importance of aligning higher education with industry needs through curriculum reform, industry-university collaboration, the integration of work-based learning, upskilling efforts, and comprehensive policy support. All of these are vital efforts to ensure that Malaysian graduates are not only prepared to enter the labor market but are also equipped to compete in an increasingly challenging global economy.

Conclusion

The Khazanah Research Institute (KRI) and the Malaysian Institute of Economic Research (MIER) have played a pivotal role in shaping Malaysia's educational landscape, particularly in efforts to enhance graduate employability. Both institutions have made significant contributions through in-depth research, innovative policy recommendations, and active collaboration with key stakeholders, including the government, educational institutions, industries, and civil society. However, the gap between education and labor market needs remains a critical challenge that requires continuous attention. While there have been advancements in improving the quality of higher education, alignment between learning outcomes and industry demands still requires further enhancement. Close cooperation among all stakeholders is crucial to ensuring that Malaysia's workforce is well-prepared to meet the increasingly complex challenges of the global economy. In the era of the Fourth Industrial Revolution, rapid technological advancements and shifting skill requirements necessitate ongoing efforts to ensure that graduates remain relevant and competitive. KRI and MIER must continue to play a proactive role in identifying future trends, proposing innovative solutions, and facilitating dialogue among all parties to address the skills mismatch between formal education and labor market needs. The recommendations put forth by KRI and MIER can serve as important guidance for policymakers and educational institutions in refining the education system to better align with current labor market demands, while also fostering adaptability and lifelong learning skills among students.

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