INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 10, (2025) E-ISSN: 2222-6990

Virtual Reality as an Instrument in Career Guidance and Counselling Interventions

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DOI Link: http://dx.doi.org/10.6007/IJARBSS/v15-i10/26715

Published Date: 27 October 2025

Abstract

This concept paper aims to discuss the integration of virtual reality (VR) as a sophisticated and innovative instrument to support career exploration among school students in Malaysia. In ensuring that the implementation of VR for school-based career guidance and counselling interventions yields long-term benefits, this paper also examines the relevance and suitability of VR elements within the current Malaysian education context. This discussion further explores the potential implications of VR – both positive and negative – on career guidance and counselling interventions, highlighting key challenges that must be addressed prior to its full-scale implementation in schools. It is anticipated that the integration of VR as a medium for facilitating career exploration among students will become essential in assisting them to make informed and confident career decisions, while simultaneously ensuring that school-based career guidance services remain relevant and effective.

Keywords: Virtual Reality, Career Counselling, Intervention, Innovative, Students

Introduction

Among ASEAN countries, Malaysia is well recognized as one of the most rapidly developing nations across multiple domains, including socioeconomics, technology, and infrastructure. Its recognition as one of the 13 partner nations of BRICS – an economic union of developing countries comprising Brazil, Russia, India, China, and South Africa – has further strengthened Malaysia's reputation as a competitive and progressively advancing country. However, the emergence of modern technological waves in the post-COVID-19 era has significantly transformed the global landscape. The rise of artificial intelligence (AI) which mimics and simulates human brain functions has profoundly reshaped the economic, political, social, and moral structures of the world (Hussein, Halimu & Siddique, 2020). In response, the Malaysian government has intensified its efforts to integrate AI into daily life while simultaneously equipping its citizens with the necessary skills to utilize this technology effectively, ensuring that they do not lag behind or become marginalized compared with citizens of developed nations. These integration initiatives also extend to the Ministry of Education, particularly at

the grassroots level. Minister Fadhlina Sidek stated that the national education system, institutional infrastructure and related policies will undergo phases of reformation through AI integration. The incorporation of digital and AI-driven innovations into the education system is crucial for human capital development. At the same time, however, it also emphasizes the need of establishing mechanisms to address the challenges posed by the Anthropocene era without neglecting the main objective of providing accessible education services, including career guidance and counselling in schools. Career guidance and counselling services that integrate AI have the potential to enhance both accessibility and effectiveness in serving clients during sessions (Maree, 2024). To ensure this effectiveness, these services must incorporate informative, contextual, and interactive elements to engage students' interests and support informed career decision-making based on accurate understandings of the contemporary world of work.

In line with current developments in teaching and learning process *(pembelajaran dan pemudahcaraan* or PdPC) which has shifted away from teacher-centered approaches and spoon-feeding delivery, career guidance and counselling services are also evolving into more dynamic, two-way processes. Students are no longer solely dependent on information provided by school counsellors; instead, they are expected to engage in active self-exploration of diverse career opportunities. Given that today's students – particularly those from Generations Z and Alpha – are technologically literate, hands-on, and highly engaged with digital platforms, traditional approaches such as career talks, leaflet distribution and hardcopy career tests are increasingly perceived as less effective and relevant. To better support students in their career exploration, AI serves as a powerful medium for delivering effective, personalized, and interactive career guidance, with no restrictions from any demographic, geographic or socioeconomic barriers.

Although growing interest in integrating AI into Malaysia's education sector has been increasingly evident, there is a significant research gap that remains concerning on the integration of this technology – specifically within the domain career and guidance services in schools. Findings by researchers Holly et al. (2024) explored young adults' expectations in engaging with a virtual reality (VR) tool named VRChances during their career exploration, as well as the tool's potential as tool for for career guidance. Similarly, a report published by The Organization for Economic Co-operation and Development (OECD) in 2023 presented the potential of Jexplore as a VR-based platform in enhancing the engagement of secondary school students in France in their career development. However, both works are more focused on international contexts and on more general aspects of career training for adolescents and young adults, rather than on the specific and systematic approach of career guidance and counselling interventions at the school level.

Virtual Reality as an Instrument in Career Guidance and Counselling Interventions

VR, which stands for 'virtual reality', is a computer-based system that generates artificial environments presented in a three-dimensional (3D) format. Supported by a range of digital equipment and hardware, VR enables users to immerse themselves and interact with these artificial environments in real time. Unlike other technological media such as online gaming platforms and chatbots, VR offers a sense of presence and emotional engagement, making it an effective tool for exploring particular phenomena and facilitating positive physical and psychological changes in users (Riva, 2023).

From a medical standpoint, VR plays a significant role in treatment and rehabilitation. For instance, researchers at the University of Washington developed SnowWorld, a VR platform designed to simulate a snowy environment where users can engage in snowball fights with snowmen, penguins, and mammoths. As the name suggests, SnowWorld aims to divert attention and provide relaxation for patients with severe burn injuries during treatment. A study by Ridout et al. (2021) reported that in four randomized clinical trials comparing VR-based and conventional interventions in hospital settings, three trials demonstrated that VR interventions successfully reduced pain among adolescent patients. These findings highlight the potential of VR as a safe, interactive, and therapeutic medium for reducing anxiety and pain in clinical settings (Ridout et al., 2021). In the education sector, VR presents significant opportunities to reform and digitalize career guidance and counselling services in schools. VR enables students to simulate desired careers and experience working environments in a realistic and interactive manner. For instance – by using VR headsets, students can virtually enter an airplane cockpit and experience piloting an aircraft within the guidance and counselling room at school. This immersive and interactive approach aligns with constructivist theory, which emphasizes learners' active role in constructing knowledge, as opposed to directly receive information conveyed by teachers. The theory highlights student engagement as fundamental in learning, where learners explore independently and generate meaningful outcomes while teachers serve primarily as facilitators. This principle is directly applicable to VR-based career exploration, where students can develop an understanding of chosen careers by engaging in immersive simulations with minimal input from school counsellors. An example of this application is CareerLabsVR, a Canadian-based career consulting agency that has developed a VR application targeting high school students and job seekers. The platform allows users to explore careers of interest through realistic simulations of job tasks and environments. For example, users can virtually experience working as an offshore pipeline welder or a process engineer (Johansen & Johansen, 2022). Such exposure enables students to gain insights and enhance self-understanding of careers that are increasingly in demand within contemporary industries.

Relevance of Virtual Reality in Malaysian Schools

Ensuring the relevance and effectiveness of VR in the context of career guidance and counselling in Malaysian schools largely depends on infrastructure and facilities determinants. While most schools under the Ministry of Education are currently equipped with basic technological facilities such as computer labs, many institutions – be it in urban, suburban, or rural areas – still utilize outdated and obsolete computer hardware and devices. To make matters worse, the average internet speed in many schools remains below standard. This infrastructural deficit hinders the effectiveness of technology-based teaching and learning processes, particularly the delivery of guidance and counselling services. Omar et al. (2023) highlighted that equipping rural schools with high-speed internet, computer devices, or tablets while reinforcing with empowering teachers and students with IT skills through systematic training, are crucial steps to narrow the digital gap between rural and urban student populations. Responding to this challenge, the government allocated RM55.2 billion to the Ministry of Education in the 2023 Budget, primarily for upgrading educational infrastructure and facilities – this includes expanding internet access and supplying approximately 50,000 laptops and other electronic devices to schools in promoting a more digitalized PdPc process.

In the context of school-based guidance and counselling interventions, three domains: awareness (1), knowledge (2), and skills (3) of school counsellors regarding VR must be prioritized. These counsellors are the primary individuals responsible for ensuring the effectiveness of VR in career guidance and counselling interventions for students. These individuals are not only required to master the fundamental technical and operational aspects of VR devices and related software but also must advance their competencies in digital pedagogical practices while considering their students' cognitive levels and psychosocial development. In order for VR to be fully utilized as a medium for students' career exploration, school counsellors need exposure and training on software, applications, and devices tailored to students' needs, age levels, and cognitive abilities. Derakhshan et al. (2020) emphasized the importance of educators to stay updated with the latest theories and practices in line with rapid technological advancements. From a counselling viewpoint, Suryahadikusumah and Nadya (2020) highlighted digital literacy – defined as (1) the skills to operate technological tools and (2) the ability to process information using those tools – as a key competency for school counsellors. Counsellors with strong digital literacy are better equipped to source and share relevant information with clients, while resulting in the enhancement of quality, engagement and effectiveness of counselling sessions (Suryahadikusumah & Nadya, 2020).

Hence, VR can be seen as an effective and appropriate tool for career exploration, provided that school counsellors are competent in both the pedagogical and technical aspects of the technology. Apart from enhancing career exploration sessions, VR holds promising prospect in supporting the implementation of the *eProfil Kerjaya Murid* (Student Career Profile or ePKM). Developed by the Ministry, ePKM is an online database designed to facilitate school counsellors in collecting, accessing, and analyzing students' personality traits, academic development and career interests, particularly for those who will be sitting or has completed the *Sijil Pelajaran Malaysia* (Malaysian Certificate of Education). Integrating VR into ePKM would enable counsellors to more accurately identify students' abilities and inclinations toward specific careers, while construct targeted intervention plans that better address students' needs. In conclusion, VR not only provides engaging and interactive career exploration experiences but also supports accurate and comprehensive student assessments.

Despite the integration of VR into career exploration has demonstrated promising potential internationally, the integration of this advanced, immersive technology within career guidance and counselling interventions in Malaysia is still perceived as premature for full-scale implementation. Yap et al. (2024) highlighted the issue of infrastructural deficits, noting that urban schools possess better facilities compared to rural schools – this imbalance reduces students' equitable access to learning resources and further exacerbates the existing digital gap between these two areas. Beyond infrastructural deficits, a report published by Rahida Aini Mohd Ismail (2025) from the Penang Institute emphasised additional obstacles such as limited internet connectivity, low levels of teachers' readiness and other sociocultural factors including inadequate support for digital learning outside the classroom as enduring challenges in integrating digital technologies into the Malaysia's education sector. These interrelated issues challenges indicated that the nation's overall readiness to integrate VR into education, particularly within career guidance and counselling services in this country, remains at an early stage. Therefore, addressing these issues is indeed important to ensure that the aspiration of integrating VR into counselling practices in Malaysia is not just a mere

castle – ambitious yet detached from empirical realities but rather becomes a feasible, immersive and inclusive instrument for the education system around the country.

Implications on Pedagogy and Psychosocial Aspects

The integration of VR into pedagogical practices has the potential to revitalize the education sector; enabling more active, dynamic, and hands-on learning strategies in schools. In the context of career exploration among school students, the practical, interactive and immersive features of VR provide school counsellors with the opportunity to expose students to real-life work environments – such as laboratories, hospitals, archaeological sites, or battlefields – without being constrained by bureaucratic, geographical or economic limitations. This VR-based career exploration approach is potentially more engaging and effective than conventional methods, which often rely on reading academic materials or watching documentary and infographic videos. Furthermore, this modern approach aligns with the digital habits of Generation Z students, who are highly IT-literate and accustomed to living in a digital environment.

Integrating VR into career exploration not only attracts the interest of Generations Z and Alpha students but also enhances their understanding of careers and self-efficacy in planning and making informed career decisions after completing their studies. By experiencing simulated real-life career situations, students can more easily align their personalities, interests, and self-perceived abilities with potential career paths. This approach is consistent with the social cognitive career theory proposed by Lent, Brown, and Hackett (1994), which emphasizes that individuals make career decisions based on their experiences and environmental contexts. The theory identifies four main domains – self-efficacy (1), outcome expectations (2), self-goals (3) and learning experiences (4) – as influential factors in academic achievement and career choices. In addition to providing experiential learning, VR allows students to make realistic predictions about the outcomes of careers they are interested in exploring. In conclusion, VR serves not only as a tool to enhance guidance and counselling interventions but also as a valuable instrument for students' career exploration and development.

However, the integration of VR technology into career guidance and counselling interventions introduces potential risks and challenges that require careful consideration. Overdependence on VR may lead to students' reliance on technology and the virtual world, in which potentially reducing face-to-face social interactions. Persistent issues such as the digital gap and infrastructural deficits, particularly between urban and rural schools, create unequal access to technology, in which may prevent rural school communities from fully benefiting from VR-based interventions. Ethical concerns related to VR implementation such as content control, students' screen time, and confidentiality of information obtained during interactive and simulated sessions also require immediate attention. Therefore, the implementation of VR technology in career guidance and counselling services should be integrated with clear policy frameworks and guidelines from relevant authorities to ensure both the effectiveness and security of the service, while preserving the interactive and immersive elements that make VR a powerful educational tool.

Recommendations for Future Implementations

Incorporating VR elements into the PdPc process serves as a new strategy to enhance career guidance and counselling, making it more dynamic and interactive in school settings. In the context of student career exploration, the immersive and interactive features of VR can provide students with enjoyable, authentic and realistic experiences through various simulated activities. The success of integration of VR into career guidance and counselling interventions in schools requires a joint effort from all stakeholders to develop strategies aligned with national education policies, such as the Malaysia Education Blueprint 2013-2025 and the upcoming Malaysia Future Education Blueprint 2026-2036. One strategy involves incorporating VR elements into the career guidance and counselling curriculum. By combining the Ministry's outlined learning outcomes with modules featuring virtual reality and interactive experiences, students – under the guidance of school counsellors – can explore chosen career fields more deeply through hands-on, simulated experiences. This approach increases students' interest and understanding of the job scope within their selected careers. These findings are consistent with the study by Makransky, Petersen, and Klingerberg (2020) which demonstrated that the integration of VR into learning processes enhances students' interest and career aspirations, particularly in science-related fields in Denmark. Their results showed that immersive VR-based learning not only sparks students' interest but also improves mastery of the subject through realistic simulation experiences.

To ensure that the effectiveness and benefits of VR-based interventions are universally accessible, the Malaysian Board of Counsellors as a key stakeholder, must play a central role in drafting guidelines for VR integration. These guidelines should adhere to ethical principles regarding client confidentiality, professional practices, and responsibilities. Similarly, the Ministry of Education should collaborate with the Board to establish policies and educational plans that integrate VR technology, while also developing and regulating technology-based service platforms. Both the Ministry and the Board also play vital roles in organizing training programs to equip school counsellors with proper digital pedagogical skills, technical competencies and ability needed to operate VR devices and software effectively. Furthermore, researchers from the country's higher education institutions and technology companies are encouraged to contribute expertise to the research, development and design of VR-based guidance and counselling platforms, devices, and content. The collaboration of government agencies, educational institutions and technology providers is crucial to realizing the objective of VR-based career guidance and counselling services in schools. This interdisciplinary collaboration will enable students in schools to engage in effective, interactive and immersive career exploration, while also aligning with the principles of 21st-century learning in today's digital age.

Conclusion

It is evident that the use of virtual reality (VR) in career exploration, particularly for school students, holds significant potential due to its unique and innovative features that can contribute directly to guidance and counselling interventions in Malaysia. Over a prolonged period, technology in education was generally perceived solely as a teaching aid. However, it has become increasingly clear that technology can serve as a catalyst in creating learning environments that still remain educational while being enriched with elements of engagement, interactivity and meaning.

Through immersive and interactive simulations of various professions, VR enables students to better understand the world of work, identify their personal interests and potential as well as plan their academic path aligned with their desired careers. In other words, VR may act as a mediator for more focused and effective career guidance and counselling interventions. Although the integration of VR into such interventions is still underdeveloped due to numerous challenges such as infrastructure disparities, ethical considerations and confidentiality concerns, the long-term benefits and advantages of this integration are equally worthy to be considered. As Malaysia is transitioning from the traditional chalk-and-talk PdPc to more dynamic and interactive approaches, VR's ability to provide career-related information in an engaging and insightful manner presents a clear advantage over conventional career guidance and counselling practices. The adage "short-term hardship for long-term benefit" clearly describes this situation: while the implementation may be hindered by various obstacles, collaboration among stakeholders in developing training curricula, guidelines and supporting infrastructure will generate substantial long-term benefits. Most importantly, it will better prepare students to make career decisions with greater accuracy and confidence.

With the rapid advancement of artificial intelligence (AI) and its significant impact on the global labour market, the Ministry of Education and the Board of Counsellors as key policymakers together with school counsellors as implementers, must restructure career guidance and counselling strategies to remain adaptive and forward-looking. VR in this regard, has the potential not only to enhance the professionalism of school counsellors but also to reduce the digital gap between urban and rural students, particularly those with limited access to direct career exposure. In conclusion, the integration of VR technology as an innovative instrument in school-based career guidance and counselling is a strategic necessity to ensure that such services remain relevant and effective in today's education landscape. In addition, it also serves the fundamental purpose of helping students make informed, well-aligned, and confident decisions regarding their future career paths.

Acknowledgement
This article is supported by research fund provided by the Faculty of Education, Universiti Kebangsaan Malaysia (TAP-K014908).

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