PRC MSU: An ASEAN Hub for Palaeontological Research and Education Strategies for Post-COVID-19 Pandemic Sustainability

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Abstract

The Palaeontology Research and Education Centre of Mahasarakham University (PRC MSU) has been a premier hub for palaeontological research and education in Thailand and ASEAN, both before and after the pandemic. This case study indicates that PRC MSU's viability factors include significant fossil discoveries, prolific research, and distinctive MSc and PhD education programs. Data from Web Analysis, SWOT, PESTLE, and stakeholder interviews indicated that the impact of the pandemic on PRC MSU programs was well-mitigated. Data regarding PRC MSU's post-pandemic sustainability indicated that the center should address its limited visibility in ASEAN. It is recommended that PRC MSU elevate its ASEAN profile by transforming these challenges into marketing advantages, leveraging its domestic and ASEAN networks. The "PRC MSU Go-ASEAN" initiative is pivotal in attracting more ASEAN palaeontology students and researchers to PRC MSU. Recommendations include strategies for the establishment of a PRC MSU ASEAN Website Portal, PRC MSU ASEAN promotions and roadshows, an ASEAN Palaeontological Association, and an ASEAN Journal of Palaeontology.

Keywords: Thailand MSU Palaeontological Research and Education Centre, ASEAN, Marketing Strategies, Palaeontological Resources

ศูนย์วิจัยบรรพชีวินวิทยา มหาวิทยาลัยมหาสารคาม: ศูนย์กลางอาเซียนด้านการวิจัยและการศึกษาบรรพชีวินวิทยากับกลยุทธ์เพื่อความยั่งยืนหลังการระบาดของโควิด-19

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Citation

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บทคัดย่อ

บทความนี้เป็นส่วนหนึ่งของกรณีศึกษาที่เกี่ยวกับศูนย์วิจัยและการศึกษาด้านบรรพชีวินวิทยาของมหาวิทยาลัยมหาสารคาม (PRC MSU) ซึ่งเป็นศูนย์กลางด้านการวิจัยและการศึกษาเกี่ยวกับบรรพชีวินวิทยาในภูมิภาคอาเซียน ทั้งก่อนและหลังการระบาดของโควิด-19 กรณีศึกษานี้แสดงให้เห็นถึงปัจจัยความเข้มแข็งของ PRC MSU ได้แก่ การค้นพบซากดึกดำบรรพ์ที่สำคัญ การวิจัยที่มีผลงานโดดเด่น และหลักสูตรระดับปริญญาโทและเอกที่มีลักษณะเฉพาะ ข้อมูลจากการวิเคราะห์เว็บไซต์ การวิเคราะห์ SWOT PESTLE และการสัมภาษณ์ผู้มีส่วนได้ส่วนเสีย พบว่าผลกระทบจากการระบาดของโรคโควิด-19 ต่อการดำเนินงานของ PRC MSU ได้รับการจัดการอย่างมีประสิทธิภาพ ในส่วนของข้อมูลเกี่ยวกับความยั่งยืนของ PRC MSU หลังการระบาดพบว่า PRC MSU ควรให้ความสำคัญกับการสร้างภาพลักษณ์ในระดับอาเซียนที่ยังมีไม่มากนัก โดยข้อเสนอแนะคือ PRC MSU ควรยกระดับบทบาทของตนในอาเซียน โดยการเปลี่ยนประเด็นข้อจำกัดให้กลายเป็นจุดแข็งทางการตลาด ด้วยการใช้ประโยชน์จากเครือข่ายภายในประเทศและเครือข่ายในระดับอาเซียน โครงการ “PRC MSU Go-ASEAN” มีบทบาทสำคัญในการดึงดูดนักศึกษาและนักวิจัยด้านบรรพชีวินวิทยาจากประเทศในอาเซียนมายัง PRC MSU โดยข้อเสนอในโครงการ PRC MSU Go-ASEAN ได้แก่ การจัดตั้งเว็บไซต์ศูนย์ PRC MSU ASEAN การประชาสัมพันธ์และโรดโชว์ในอาเซียน การจัดตั้งสมาคมบรรพชีวินวิทยาอาเซียน และวารสารบรรพชีวินวิทยาอาเซียน

คำสำคัญ: ศูนย์วิจัยและการศึกษาด้านซากดึกดำบรรพ์ มหาวิทยาลัยมหาสารคาม ประเทศไทย, อาเซียน, กลยุทธ์การตลาด, ทรัพยากรซากดึกดำบรรพ์

Introduction

Mahasarakham University Palaeon tology Research and Education Centre (PRC MSU), established in 2008, serves as a pivotal institution for palaeontological research within Thailand and the wider ASEAN region. Located in the fossil-rich northeastern Khorat Plateau (Department of Mineral Resources, 2025), the PRC MSU benefits from proximity to some of Thailand's most significant fossil discovery sites. Its academic offerings, inclu ding distinctive MSc and PhD programs in palaeontology, further consolidate PRC MSU's position as a leader within the ASEAN palaeontological research community.

The COVID-19 pandemic, spanning from 2020 to 2023, significantly disrupted palaeontology in Thailand by limiting access to fossil sites, halting international collaborations, and reducing financial support, which impacted research, museum operations, and public engagement. Research activities and educational outreach slowed, while canceled conferences limited professional networking. To address these challenges, strategies such as enhancing digital platforms, promoting local fieldwork, securing alternative funding, investing in digital research skills, and strengthening regional collaborations are recommended to support the sector's recovery and long-term sustainability (MacLeod, 2025). The COVID-19 pandemic disrupted educational and research activities globally, and the PRC MSU was not exempt from these challenges. The pandemic adversely affected the Centre's research and educational programs, impacting both fieldwork and institutional operations. Nevertheless, through the implementation of targeted mitigation strategies, PRC MSU was able to sustain core activities, as demonstrated by the empirical data collected during the study period. Acknowledging the critical importance of palaeontological science, PRC MSU remains firmly committed to enhancing the resilience and sustainability of its research and educational programs in the evolving post-pandemic landscape.

This article draws from an exploratory qualitative case study conducted between July 2021 and August 2023, examining the impact of the COVID-19 pandemic on PRC MSU, Education, and potential Entrepreneurship Programs (REEP). For conciseness, the present article focuses specifically on the viability and liability data concerning PRC MSU's REEP activities, with particular emphasis on advancing PRC MSU's role as a leading hub for palae-ontology in the ASEAN region. The research objectives were to identify the pandemic's impact on the resilience strategies employed within PRC MSU's research and educational programs; second, to analyze the viability factors and liability challenges that influence the long-term sustainability of these programs; third, to explore transferable strategies from selected Palaeontological Management Groups (PMGs) that may inform future development efforts; and fourth, and to recommend strategic approaches for strengthening the sustainability and growth of PRC MSU's research and educational initiatives in the post-pandemic era.

Method of Study

This case study provides an overview of the PRC MSU's REEP, structured around defined research objectives. Data were collected from the PRC MSU official website, selected domestic and international PMG websites, and interviews with six senior PRC MSU staff. Using WA, SWOT, PESTLE analyses, and structured interviews, the study employed systematic triangulation for data verification and extrapolation (Table 1).

Table 1 Interpolation, Verification, Validation, Extrapolation

WA	Interpolation: Preliminary Data Analysis
SWOT	Interpolation: Data on Viability and Liability Issues
PESTLE	Verification: Causal Factors of SWOT Data
Interview	Verification and Validation: WA, SWOT and PESTLE Data.
Data	Extrapolation - Post-Pandemic Sustainability

Data were categorized into viability (strengths and opportunities) and liability (weaknesses and threats) factors. Sources included websites of PRC MSU, museums, and geoparks across international, ASEAN, and domestic networks, with hundreds of PMGs analyzed for transferable strategies to enhance PRC MSU's post-pandemic sustainability. The study highlights PRC MSU's pandemic resilience strategies in research, education, and potential entrepreneurship, emphasizing the need for strengthened colla borations with PMGs to boost institutional capacity. It also positions PRC MSU as a key ASEAN palaeontology hub while stressing the strategic importance of PRC MSU and PMGs in preserving paleo-geological biodiversity. Conducted from July 2020 to September 2023, the study's findings were validated through multiple analytical frameworks and interviews with PRC MSU leadership and staff.

Findings and Discussion

The findings are categorized and conflated into SWOT (viability) and SWOT (liability) issues. The data on viability and liability issues are dual strategies to be recommended to PRC MSU for post-pandemic sustainability

1. PRC MSU Viability Factors

1.1 PRC MSU Supportive Autho rities

The PRC MSU operates under the Ministry of Higher Education, Science, Research and Innovation (MHESI), with national research oversight provided by its agency. It maintains a strong partnership with the Department of Mineral Resources, collaborating on paleo-geological programs and fossil heritage management. Additionally, the PRC MSU functions within the legal framework of the Fossil Protection Act B.E. 2551 (Department of Mineral Resources, 2008), which defines palaeontological resources, outlines enforcement mechanisms, and governs the protection and management of fossil resources in Thailand.

1.2 PRC MSU Research Program

The PRC MSU's palaeontological research program is its core strength, marked by prolific contributions from both Thai and international researchers. From 2009 to 2019, the PRC MSU published 125 significant studies covering a wide range of fossil types, geological eras (e.g., Paleozoic, Mesozoic), and regional locations across Thailand, Laos, Indochina, Southeast Asia, and China. Despite the COVID-19 pandemic, research contin ued between 2020 and 2023, contributing unpublished work, hosting, and co-hosting major international events such as ICP6 and UNESCO IGCP 700. Key projects during this period included fossil biodiversity studies at notable sites like Phu Noi and Phu Sung, conservation efforts at the Petrified Forest Park and Petrified Wood National Park, and regional collaborations such as PalBioDivASE. These efforts highlight the PRC MSU's leading role in advancing palaeontological science in the region. The following is a partial list of 20 out of 33 diverse research presentations at the ICP6 (Table 2).

Table 2 ICP6: Partial list of topics of presentations

No.	Topics	Fields
1	Fossil hunting in the Far East: the history of palaeontological collecting in eastern Asia.	History of Palaeontology
2	Bridging palaeontological and geological collections: the indissoluble complementarity.	Palaeo-Geology Complementarity
3	Hidden histories revealed in scientific revision of palaeontological collections.	Palaeontological Collections.
4	Digitizing palaeontological collections.	Digital Palaeontology
5	Digital palaeontology: new insights into the evolution of the organisms through multidisciplinary.	Digital Palaeontology and Evolution
6	Palaeoenvironments in Palaeontology: methods, tools and limits. A review to go further.	Paleoenvironment in Palaeontology
7	Palaeontological heritage, geoparks and geotourism	Palaeontological Heritage
8	Preserving the world's natural history: an ethical dilemma	Ethics and Palaeontology
9	Dinosaur ichnology comes of age: the geo-heritage value of the tetrapod trace fossil record.	Ichnology
10	Late *Neogene-Quaternary* continental ecosystems, zoogeography, and biotic exchange across the Asia-Pacific.	Continental Ecosystems

The PRC MSU UNESCO IGCP 700 is an ongoing major project on carbonate studies with focus on the following as shown in Table 3.

Table 3 UNESCO IGCP 700 Projects

No.	Projects Topics
1	Carbonate sedimentology, structure and palaeontology of Thailand and ASEAN for academic or applied studies.
2	Integration and information on Palaeozoic carbonate build-ups throughout South East Asia.
3	Scientific, socio-economic applications of carbonates for scientists, decision makers, politicians, and companies
4	Carbonates landscape for geotourism through collaboration with geoparks and national parks.

1.3 PRC MSU international conferences and projects

The PRC MSU has played host and co-host to numerous international palaeontological events and initiatives. Since its founding, the PRC has maintained a strong global presence, welcoming collaborations and visits from palaeontologists around the world. One of its major efforts, the UNESCO IGCP-700 project titled "Palaeozoic Carbonate Build-Ups in Southeast Asia," is a five-year joint initiative with various Asian institutions. This project investigates carbonate structures like ancient reefs and atolls that formed between 470 and 250 million years ago. IGCP 700 is notably the first effort dedicated to studying limestone formations in terms of their geological characteristics, economic value, and societal applications (UNESCO, 2024).

1.4 PRC MSU education program

PRC MSU offers unique MSc and PhD programs in Palaeontology, setting it apart within the ASEAN region. These programs aim to develop highly skilled professionals with global competence to contribute to both community and national development. The curricula, crafted by both Thai and international palaeontologicalexperts, are designed to meet international standards and are comparable to leading programs worldwide.

1.5 PRC MSU academic and community outreach program

The PRC MSU academic services and community outreach program have been prolific, involving school, college students and local communities such as Annual palaeo ntology camps for children's, families, and general public, Palaeontology camp for schools and community outreach, PRC MSU fossil exhibitions, Workshops and short courses, National and international palaeontology academic conferences, and Exhibitions and special outdoor events in palaeontology.

2. PRC MSU Liability Factors

2.1 PRC MSU Programs

The limited visibility of PRC MSU within ASEAN may stem from its relatively modest online presence. Its research and academic programs are not broadly recognized across the region, aside from within specialized circles of palaeontologists and researchers. To enhance its regional profile, PRC MSU could actively promote the value of palaeo ntology and expand outreach efforts to market its programs throughout ASEAN. PRC MSU

could leverage its palaeontological research and education, excellent facilities, abundance of fossils and successful organization of international palaeontological conferences. For instance, the PRC MSU homepage website could be the main platform to promote its MSc and PhD in Palaeontology Program in ASEAN. Yet, the PRC MSU website presence is still relatively low profile, despite being known abroad among collaborating palaeontological organizations, and the successful organi zations of ICP6 2023, and the IGCP UNESCO 700 Carbonate projects. In addition, the PRC MSU has a distinctive PhD and MSc in Palaeontology educational program, a niche in ASEAN. The dearth of such programs in ASEAN could be an opportunity for PRC MSU. There is a need to promote these niche programs. A presumed public perception is that there is a lack of a significant palaeon tological program in ASEAN.

2.2 ASEAN palaeontology challenges

The Asian Palaeontological Association (APA) has identified a number of challenges and opportunities for advancing palaeontological research within the ASEAN region over the coming decade. Despite ongoing efforts, the APA emphasized the need to increase the visibility of palaeontology across ASEAN and to foster greater recognition beyond the scientific community. Compared to global leaders such as China, the ASEAN region remains under represented in the international palaeontological landscape, with Thailand being a notable exception due to its substantial fossil discoveries. This limited recognition is largely due to the scarcity of major fossil sites across many ASEAN countries. However, this gap presents an opportunity for institutions like the Palae ontological Research and Education Centre (PRC) at Mahasarakham University to play a leading role. As ASEAN currently lacks a centralized palaeontological hub of international capacity, PRC MSU is well-positioned to fill this void and elevate the region's profile in the field. The development of palaeontology in ASEAN is shaped by various factors, including institutional support, public awareness, and international collaboration (Kapur, 2024)

The APA identified several challenges to advancing palaeontology in the ASEAN region, including the need to keep pace with scien tific advancements, disparities in economic development and technology adoption, and limited funding and resources. These issues can hinder the growth and visibility of the field across Southeast Asia. To address these challenges, there is a need to strengthen palaeontological research and public awar eness. The PRC at MSU could play a key role in this effort by collaborating with the APA to enhance the field's regional profile and foster greater engagement.

2.3 ASEAN universities

There is a dearth of specialized MSc. and PhD in Palaeontology programs in ASEAN universities, despite the presence of palaeo ntological resources. Many ASEAN universities run delimited palaeontology under geology or geoscience departments, *sans* full-fledged postgraduate palaeontology programs. The PRC MSU could provide the lead in palaeo ntological science programs for ASEAN palaeontologists and students.

2.4 ASEAN students and higher costs of palaeontology abroad

PRC MSU could market its program to capitalize on affordability, and comparably higher costs to study palaeontology abroad for ASEAN students. Students may apply for scholarships, yet it may be competitive. Scholarships may cover a part or all of the tuition fees, yet they may require extra funding for various living costs.

3. Viability of PRC MSU palaeontology for ASEAN students

3.1 PRC MSU cost-effective palaeontology for ASEAN students

The PRC MSU could be a good choice for ASEAN students. An online Thailand expatriate media report highlighted the pros and cons of studying in Thailand based on several factors, including the cost of living. The cost of living in Thailand is much lower than in many other countries, so students can expect to save money if they decide to study in Thailand (Pyae, 2023). One of the advantages of studying in Thailand is the opportunity to immerse oneself in a unique culture and diverse landscapes that offer students unique experiences to conduct palaeontological fieldwork in a variety of settings. Studying in an ASEAN country like Thailand can help students enhance their regional identity. These factors make PRC MSU Thailand an attractive choice for ASEAN students interested in studying Palaeontology.

3.2 Research opportunity

The Palaeontological Research and Education Centre (PRC) at Maha sarakham University plays a leading role in advancing palaeontological research and education in both Thailand and the wider ASEAN region. This prominence is supported by several core strengths. Thailand's rich fossil heritage, particularly the significant sites studied by PRC MSU, has provided valuable insights into prehistoric life and deepened scientific understanding of Earth's history. The center has also contributed to a wide array of research initiatives, both nationally and regionally, making meaningful scientific contributions across Southeast Asia. Moreover, PRC MSU is equipped with modern facilities that support advanced research in virtual palaeontology and artificial intelligence—emerging fields that are shaping the future of Earth sciences, as noted by Pandolfi *et al.* (2020). International collaboration further enhances the center's capabilities, enabling partnerships with renowned institutions and researchers around the world. These collaborations have made it possible for PRC MSU to host prestigious events such as the 6th International Conference on Palaeontology (ICP6) and the UNESCO IGCP 700 project. With these assets, PRC MSU stands as a key institution in the region's palaeontological landscape. Moving forward, it has the opportunity to broaden its impact by engaging more deeply with other ASEAN countries and leveraging their unique contributions to the field (Plotnick *et al.*, 2023).

4. Discussion and recommendations

There recommendations herein are based on the findings of analysis results and conclusions. Recommendations are also interpolation and extrapolation justified by the data. The

recommendations are a conflation of strategies for enhancement and resolutions of PRC MSU viability and liability issues. The solutions could be preliminarily leveraged on an enhancement of the PRC MSU website, and subsequently on practical capacity-building strategies.

4.1 Upraise PRC MSU online ASEAN profile

The PRC MSU can strengthen its ASEAN and global profile by enhancing its digital presence. This includes improving the PRC MSU homepage to reflect international standards in design and English language usage, reinforcing its image as a regional palaeontological hub. Additionally, better use of social media, with clearer language, updat ed content, and informative links, can increase visibility and engagement across wider audi ences.

4.2 PRC MSU online publicity on research and education programs

Highlight PRC MSU contributions to Thailand palaeontological heritage, research and education facilities, allied institutions – museums, geoparks etc. Highlight its organi zational capability and capacity for hosting of international palaeontological science confer ences. Promote its palaeontological research and STEM education programs for ASEAN students. Artificial Intelligence and palaeontol ogy, according to Xu *et al*. (2023) enabled analysis of large datasets and uncover patterns in fossil records and geological formations. Yu *et al.* (2023)'s first systematic review of AI applications in palaeontology highlighted AI data-driven palaeontological studies with unprecedented insights into evolutionary history.

4.3 PRC MSU ASEAN promotion tour programs

Promote PRC MSU REEP as a niche education program in Thailand and ASEAN through research and educational tour programs. This involves participation in research and educational conferences, exhibitions in each of ASEAN member countries, and a student's exchange program. PRC MSU could promote the PhD and MSc Palaeontology and applications of virtual palaeontology. Rahman and Smith (2014) highlighted practical techniques of virtual palaeontology for computer-aided analysis of fossil forms and functions. Pandolfi *et al.* (2020) underscored that AI is evolving virtual and computational palaeontology as the frontiers in Earth Science. Garwood (2012) noted that virtual palaeontology enabled the study of fossils through three-dimensional digital visualizations, providing powerful tools for analysis and dissemination of fossil data.

4.4 PRC MSU strategies in facing challenges of ASEAN palaeontology

To address the evolving challenges of palaeontology in the ASEAN region, the PRC MSU is well-positioned to take a leadership role in fostering regional collaboration through a comprehensive, multi-pronged strategy. Drawing inspiration from the ASEAN Annual Report 2021–2022 (ASEAN secretariat, 2022), several key approaches are recommended. First, fostering collaboration through strengthened regional and international partnerships—

such as with the Asian Palaeontological Association—can facilitate the exchange of knowledge, resources, and best practices. Second, investing in palaeontology education by developing targeted programs and training initiatives will help cultivate a new generation of local experts. Third, improving research infrastructure through the upgrading of facilities and access to modern technologies can significantly elevate research quality. Fourth, enhancing data accessibility and public engagement by promoting open-access databases and increasing outreach through museums, exhibitions, and digital media will ensure wider participation and support for the discipline. Finally, policy support and securing diverse funding sources, including government grants, private partnerships, and international donors, are crucial for long-term sustainability and protection of fossil heritage. These strategies, aligned with ASEAN's guiding theme of "Addressing Challenges Together," highlight the value of collective regional effort in advancing palaeontological research and education across Southeast Asia.

4.5 PRC MSU and Intra-ASEAN strategic collaborations in palaeontology

The PRC MSU can strengthen intra-ASEAN collaborations in palaeontology by engaging professional and amateur palaeontologists, educational institutions, and the public. Effective partnerships between fossil clubs and professional researchers have been shown to enhance knowledge-sharing and community involvement. Collaborative research at the undergraduate and postgrad uate levels has also proven valuable, often resulting in quality outputs and academic recognition. Additionally, online platforms such as blogs and wikis offer dynamic spaces for collaborative learning, enabling broader engagement and deeper understanding of palaeontological concepts. These strategies collectively support scientific growth and educational enrichment in the field.

4.6 Engagement with ASEAN educational and scientific networks

The PRC MSU can deepen its engagement with ASEAN educational and scientific networks to enhance regional collab oration and research capacity. The ASEAN Science & Technology Network (ASTNET) fosters partnerships among academic institu tions, research centres, and the private sector, promoting cooperation in fields such as biotechnology, food science, meteorology, and geophysics. Similarly, the ASEAN University Network (AUN) provides a platform for leading higher education institutions across the region to collaborate through various programs and initiatives. Both networks support the interna tionalization of education, offering valuable opportunities for students and researchers to gain global exposure, exchange knowledge, and participate in joint projects.

4.7 Leverage ASEAN higher edu cation and research networks

A report on Shape of Global Higher Education: Understanding the ASEAN Region (Atherton et al., 2018) provided a scenario of international higher education in ASEAN. PRC MSU may establish a niche in palaeontology

within ASEAN higher education systems to facilitate The PRC MSU could strengthen its role in palaeontological research and education by engaging with key ASEAN and Asia-Pacific networks. The ASEAN Roadmap 2025 aims to create a common higher education space, supporting people-to-people connectivity and recognition of qualifications across the region. Additionally, regional cooperation initiatives, including networks like ASAHIL, UMAP, APRU, AUF, AAOU, and APAIE, along with APQN and UNESCO conventions, offer platforms for international collaboration, knowledge sharing, and academic mobility. These opportunities could significantly enhance the PRC MSU's international profile and research capacity.

4.8 Promote palaeontology via media and popular culture

The PRC MSU could capitalize on the public interests in dinosaur movies and enter tainment industry. PRC MSU could leverage on Jurassic movies` impact on palaeontological interests. The Jurassic Park movies has had a significant impact on public view of palaeontology and interest in dinosaurs and prehistoric life. Dinosaur movies or exhibitions could aid a palaeontological institution to promote its research and education programs to spark the following interests (McKie, 2018). The Jurassic Park franchise significantly boosted public interest in palaeontology, inspiring a new generation of scientists by making the field more accessible and exciting. This "Jurassic Park effect" led to a notable rise in student enrolment in palaeontology programs. Additionally, the upcoming filming of Jurassic World 4 in Thailand could indirectly enhance the PRC MSU's visibility within ASEAN.

4.9 Promote PRC MSU palaeontology in social media and public engagements

Promoting Palaeontology programs through social media can be an effective way to increase visibility and interest. Here are some strategies that could be considered (Caetano & Ponciano, 2021): Collaborations with Media: Collaborating with film, television, and digital media producers can help bring palaeontology to a wider audience. This could involve consulting on documentaries or fiction al works that feature palaeontology, or short documentaries on the work of a PRC MSU.

For social media and educational engagement, platforms such as Instagram, Twitter, and YouTube can be used to share exciting discoveries, scenes of PRC MSU research process, and educational activities. Developing educational resources for schools, such as palaeontological science -related lesson or classroom visits, can help inspire the next generation of palaeontologists (Wolff, 2025). These strategies can help make palaeontology more accessible and interesting to the general public, and promote the programs of PRC MSU.

4.10 Promote PRC MSU Palaeontology through Tourism Thailand

Promoting palaeontology through tourism offers a valuable opportunity to raise awareness and interest in the field. The PRC MSU can collaborate with the Tourism Author

ity of Thailand (TAT), which emphasizes high-value, sustainable tourism, to expand its reach. By leveraging digital transformation and aligning with TAT's goals, the PRC MSU can enhance visibility through virtual platforms, educational tours, and workshops that highlight the role of palaeontology in preserving natural heritage. Notably, TAT has proposed developing a dinosaur theme park in Khon Kaen, which could further boost regional tourism and support palaeontological education.

4.11 Establishment of ASEAN palaeo ntological association

The PRC MSU could leverage on ASEAN research and educational network to establish ASEAN Palaeontological Association (ASEAN PA). The PRC MSU could be the Secretariat for ASEAN Palaeontological Association. The ASEAN PA could be a chapter of the Asian Palaeontological Association (APA).

4.12 Portalization of PRC MSU homepage for ASEAN palaeontological resources

The PRC MSU website could be transformed into a central portal for palaeo ntology in Thailand and the broader ASEAN region. Such a portal would serve as a trusted and comprehensive online resource, offering detailed information on various aspects of palaeontology. To be effective, the portal should meet several key criteria. First, it should function as a comprehensive platform, enco mpassing the full scope of palaeontological studies in ASEAN. This would include fossil research, organism classification, and pale oecology—the study of ancient organisms and their interactions with past environments (Palaeontology Online; Paleoportal.org). Second, the site should feature a searchable palaeontology database, allowing users to browse fossil images by taxonomy and geological time. This database could also include information on academic programs, field guides, publications, and training opportunities relevant to palaeontology across the region. By incorporating these elements, the portal would become an engaging, informative, and accessible tool for students, researchers, and the public alike (Hammer *et al*., 2002).

4.13 Establish a PRC MSU journal of ASEAN palaeontology

PRC MSU could initiate publication of PRC MSU Journal of ASEAN Palaeontology. PRC MSU could initiate an in-house journal with contributions from researchers, academic staff and students. The journal could gradually become an ASEAN Palaeontology Journal, in tandem with the suggestion for an ASEAN Palaeontological Association (MacLeod, 2025).

Conclusion

MSU PRC MSU has the capacity to move forward ASEAN palaeontological science research and education programs. The PRC MSU is continually innovating its palaeontology programs with sustainability strategies based on recent trends and advancements. The PRC MSU is capable to lead ASEAN in palaeontological research and education for the following benefits.

In conclusion, the PRC MSU could enhance its profile in ASEAN to maintain and enhance its status as a hub of palaeontology in the region. PRC MSU and ASEAN palaeontological community should contribute toward facing the 21st century challenges of climate change, biodiversity loss, and for sustainable energy sources. The PRC MSU could take the lead in synergizing the extinct and the extant to advance palaeontological science mission in ASEAN.

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