



By Prof Dato' Dr Noor Azizi Ismail on 12 May 2023

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In today's fast-changing environment, innovation is a key factor in any organisation's success. It involves identifying problems, challenges, or opportunities and developing creative solutions to address them. By constantly seeking out new ideas and adapting to changing market conditions, organisations, including higher education institutions (HEI), can remain relevant and sustainable over the long term.

## Strategy for Innovation

Creativity is the starting point for innovation. Leaders must encourage team members to think outside the box and explore new ideas. They must also empower the team. Give them the freedom and resources they need to pursue their ideas and experiment with new solutions. Encourage risk-taking and embrace failure as a learning opportunity.

Diversity is another critical factor in fostering innovation. When you have a diverse team, you bring together different perspectives, experiences, and skill sets that can lead to more innovative solutions. To truly foster innovation, leaders need to build a culture that values it. This means creating an environment where innovation is encouraged, recognised, and rewarded.

Finally, leaders need to embrace new technologies and explore how they can help organisations innovate and create value. But remember, innovation is not a one-time event but an ongoing process that requires continuous effort and attention. So keep innovating, keep learning, and keep pushing the boundaries of what is possible.

## The Role of Higher Education

Universities can play a critical role in the innovation ecosystem by fostering a culture of innovation among the faculty and students and providing resources to support research, development, and entrepreneurship.

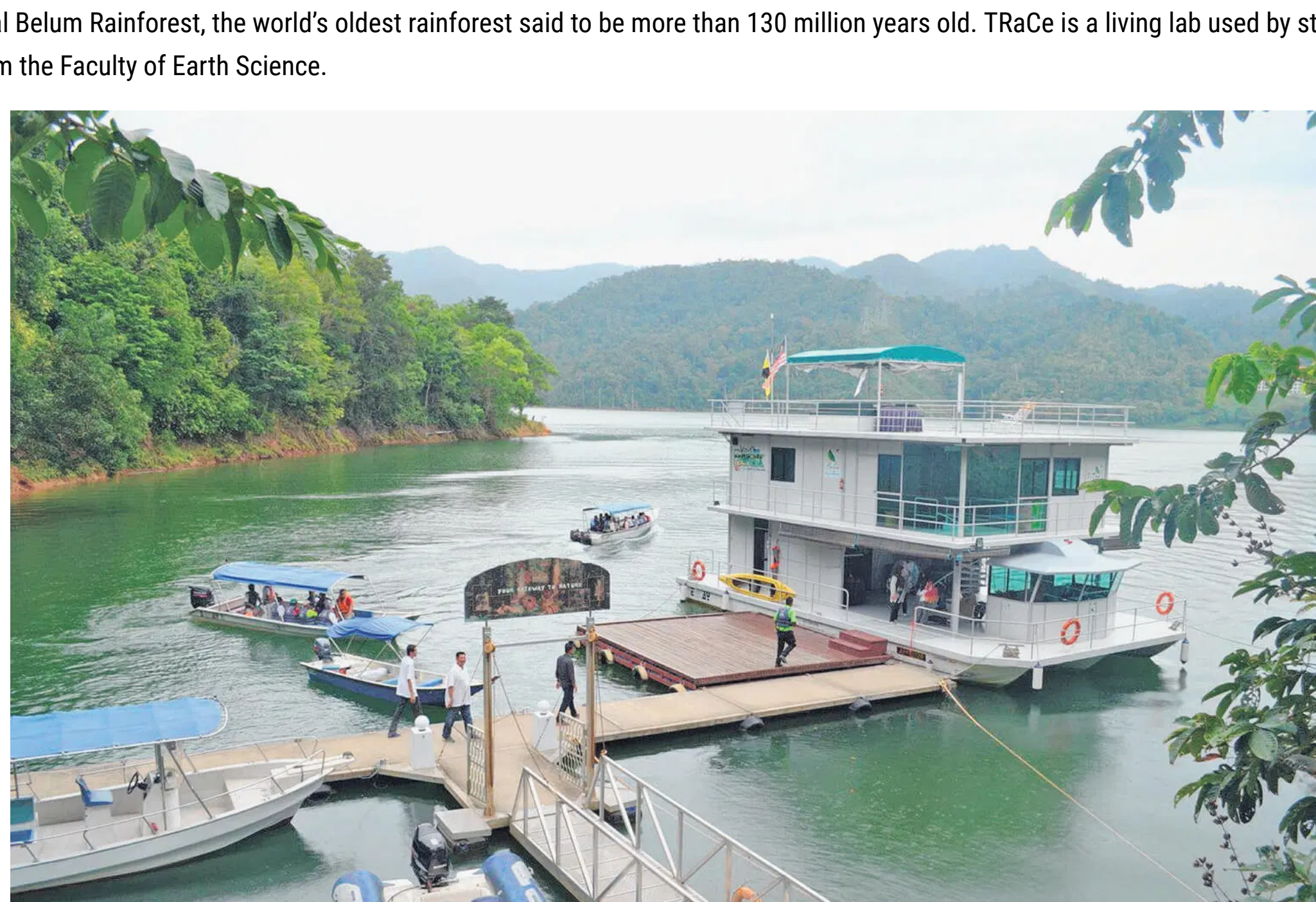
Being centres of research excellence, universities can conduct research that generates new knowledge and ideas, as well as develop new technologies, products, and services. This research can be applied to a wide range of fields, from science, technology, and engineering to the social sciences and humanities.

Second, universities can provide entrepreneurship education to students, helping them develop the skills and knowledge needed to start and grow their own businesses. This can include courses on business planning, marketing, finance, and legal issues, as well as mentorship and networking opportunities.

Third, universities can facilitate the transfer of knowledge and technology from the academic to the private sector. This can be done via licensing agreements, spin-off companies, or partnerships with industry. Fourth, universities can provide physical and virtual incubators and accelerators that offer support to start-ups, such as access to funding, mentorship, networking opportunities, and resources such as office space and equipment.

Finally and most importantly, universities can collaborate with industry, government, and other organisations to conduct collaborative research and development projects. This can help to leverage expertise and resources from multiple sources, leading to more innovative solutions.

I believe collaboration is the key to any successful innovation project. Universiti Malaysia Kelantan (UMK) has a Tropical Rainforest Research Centre (TRaCe) at Royal Belum Rainforest, the world's oldest rainforest said to be more than 130 million years old. TRaCe is a living lab used by students and researchers from the Faculty of Earth Science.



Royal Belum | Utusan Malaysia/Brains 2018

I recently attended a roundtable discussion organised by the Pulau Banding Foundation. Joining us are twelve other agencies, including NGOs and state and federal agencies. There were presentations and brainstorming sessions. At the end of the three days, we came up with so many workable ideas that can address issues such as climate change, biodiversity, conservation, and human-environment interactions. That is the power of collaboration.

## Innovative Universities

The Massachusetts Institute of Technology (MIT) is one of the most well-known universities for innovation. It has a long history of producing cutting-edge research in science and technology. MIT has established several entrepreneurship programmes, such as the Martin Trust Centre for MIT Entrepreneurship, which offers mentorship, funding, and other resources to start-ups.

Stanford University is another leader in innovation. It is home to the Stanford Research Park, which has spawned hundreds of successful technology companies, including Hewlett-Packard, Google, and Cisco. Stanford also offers entrepreneurship education programmes, such as the Stanford Graduate School of Business's Centre for Entrepreneurial Studies.

The University of Waterloo in Canada is known for its focus on innovation and entrepreneurship. It has established several innovation hubs, such as the Velocity programme, which provides funding, mentorship, and resources to start-ups. The university also offers entrepreneurship education programmes and has produced several successful start-ups, including Kik and Vidyard.

The Israel Institute of Technology (Technion) is a leader in innovation in the Middle East. It strongly focuses on technology and has produced several successful start-ups, including Mobileye and Waze. Technion also offers entrepreneurship education programmes and has established several innovation centres, such as the Jacobs Technion-Cornell Institute in New York City.

In Asia, the National University of Singapore (NUS) is a leader when it comes to innovation. It has several innovation hubs, including the NUS Enterprise, which offers incubation and acceleration programmes to start-ups.

Another notable example is Tsinghua University. The university has built a strong ecosystem of innovation, including incubators, accelerators, and venture capital funds that support the commercialisation of new technologies and products. Another key factor contributing to Tsinghua's success is its emphasis on interdisciplinary collaboration, via interdisciplinary research centres and institutes that bring together researchers from different fields to work on complex problems and develop innovative solutions.

## Innovative Products

Some world-renowned universities are famous for commercialising innovative products. For example, Google's founders, Larry Page and Sergey Brin, developed the PageRank algorithm while they were students at Stanford University. They later founded Google, which is one of the world's largest and most successful technology companies.

Lyrica, a medication used to treat nerve pain and seizures, was developed by Pfizer in partnership with Northwestern University. Remicade, a medication used to treat autoimmune diseases such as rheumatoid arthritis and Crohn's disease, was developed by Johnson & Johnson in partnership with New York University. Both drugs are top-selling products, with annual sales in the billions of dollars.

More recent examples of innovations include CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), a revolutionary gene editing technology that was developed by scientists at the University of California, Berkeley, and the Broad Institute of MIT and Harvard. CRISPR allows researchers to edit DNA and has the potential to transform medicine and agriculture.

Researchers at the Royal Melbourne Institute of Technology (RMIT) in Australia developed a solar paint that can generate clean energy from the sun. The paint contains a compound that absorbs moisture from the air and uses it to split water into hydrogen and oxygen, which can be used to generate electricity. A technique for 3D printing human organs using living cells was developed by researchers at the University of California, San Diego, and has the potential to revolutionise organ transplantation by making it possible to produce organs on demand.

Researchers at the University of Washington developed a smart contact lens that can monitor blood sugar levels in people with diabetes. Another example is Tsinghua University's School of Medicine, which has developed artificial intelligence (AI)-powered medical diagnostics software that has been licensed to several medical technology companies. This software uses AI algorithms to analyse medical images and identify potential health issues, helping to improve the accuracy and speed of medical diagnostics.

## Challenges

Despite the potential, universities are also facing challenges. One of the main challenges is securing funding for research and development. Second, universities face challenges in protecting their ideas and inventions in order to commercialise them successfully.

Third, universities may face challenges in recruiting and retaining talented and skilled individuals, who may be lured away by higher salaries and more lucrative job opportunities in the private sector. Fourth, developing innovative products often requires collaboration and partnerships with other organisations, which can be very challenging.

Finally, universities may face regulatory hurdles when it comes to commercialising innovative products. Regulations around IP, patents, and licensing can be complex and difficult to navigate, and universities need to be able to work within these regulations in order to bring their products to market.

## Role of Government and Industry

Support from industry and government agencies is critical. First, they can provide universities with the funding they need to undertake disruptive research and development projects that have the potential to transform industries and improve people's lives.

Second, they can help universities build partnerships and collaborations with other organisations that have the expertise and resources needed to develop innovative research products. These collaborations can help universities access new markets, expand their research capabilities, and bring their products to market more quickly.

Third, they can provide universities with access to a range of experts and specialists who can help guide the development of innovative products. For example, industry partners may be able to provide insights into market demand and consumer behaviour, while government agencies may be able to provide guidance on regulatory requirements and safety standards.

Finally, industry and government support can also help universities transfer their technology and intellectual property to the private sector. This can be done through licensing agreements, spin-off companies, or other forms of technology transfer.

## Conclusion

There are several qualities that are essential for fostering innovation in higher education. The first is creativity – the ability to generate new and original ideas, approaches, and solutions to complex problems. Another important quality is curiosity – the desire to learn, explore, and discover new things.

Third, innovation requires collaboration and teamwork among faculty members, students, industry, and government agencies, to work together, share ideas, and combine their expertise to develop innovative solutions. Fourth, HEIs must be able to adapt to changing circumstances and be open to new approaches and ideas. They also need to create an environment that encourages risk-taking and experimentation.

Next is the entrepreneurial mindset. This involves a focus on creating value, identifying opportunities, and taking action to bring new ideas to market. But innovation can be a challenging and sometimes frustrating process. Therefore, individuals and institutions need to have resilience in order to overcome obstacles and persist in the face of setbacks.

Last but not least, is visionary leadership. University leaders need to have a clear vision of where they want to go and be able to inspire and motivate others to work towards that vision. By cultivating these qualities, HEIs can create an environment that encourages innovation and helps drive progress and growth.

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