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O18 - Astronomy Research-Based Learning as an Alternative to Classroom Education

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Astronomy is a globally recognized field that inspires people of all ages and serves as a powerful gateway to science, technology, engineering, and mathematics (STEM). The National Astronomical Research Institute of Thailand (NARIT) is dedicated to advancing astronomy and astrophysics through scientific research, education, and public outreach. One of its key educational initiatives is the Astronomy Research-Based Learning Workshop, which provides an alternative learning experience beyond the traditional classroom.

The workshop adopts a research-based learning approach, allowing students to gain hands-on experience by conducting authentic astronomical research. Through this program, participants develop practical astronomy skills while strengthening their understanding of the scientific method and critical thinking—competencies that are essential for the 21st century but are often underemphasized in conventional education. Students analyze real observational data collected by robotic telescopes, learn to use professional astronomical software, and conduct their research under the guidance of experienced astronomers.

More importantly, the workshop encourages students to think like scientists. Rather than simply following predetermined activities, they are encouraged to formulate their own research questions, investigate astronomical phenomena that interest them, and develop evidence-based conclusions. This inquiry-driven approach helps students cultivate creativity, problem-solving skills, and scientific curiosity while providing valuable insight into astronomy as a potential career.

To further strengthen research-based extracurricular learning, NARIT established the Thai Astronomical Conference (TACs), a national platform where secondary school students present their astronomy research projects. Over the past decade, TACs has showcased more than 500 student research projects, providing young researchers with opportunities to exchange ideas, receive feedback from experts, and gain valuable presentation experience. During the past three years, outstanding projects have also been recognized with medals, encouraging students to continue pursuing research and innovation in astronomy.

Through these initiatives, NARIT demonstrates that astronomy can be far more than a classroom subject. By engaging students in authentic scientific research and providing opportunities to communicate their findings, research-based learning not only enhances scientific knowledge but also develops the critical thinking, creativity, and research skills needed to prepare the next generation of scientists and innovators.

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