Online Solar Observatory For Solar Learning Program Among Orang Asli’s Community

1Lau Chen Chen and 2Zahira Mohd Radzi

1,2 National Space Agency (ANGKASA), Lot 2233, Jalan Turi, Kg. Sg. Lang, 42700 Banting, Selangor, Malaysia

lau@angkasa.gov.my, zahira@angkasa.gov.my

Abstract: Literatures indicate a few researches have been studied involving the Orang Asli community but a dearth is found focusing on ICT education and internet usage among the Orang Asli schoolchildren. These groups need the help of various parties, especially the government to ensure schools with Orang Asli children and community must be equipped with ICT facilities for them. Besides that, not all community or schools afford to have their own telescopes to do solar observation or participating in solar observation program at planetarium or science center. Therefore National Space Agency of Malaysia (ANGKASA) has taken initiative collaborate with National Planetarium (PLANET) and Department of Orang Asli Development (JAKOA) to conduct Solar Astronomy Learning Program among Orang Asli community through development of Online Solar Observatory (OSO). Orang Asli schoolchildren and community can learn solar astronomy virtually through the OSO. This pilot project will focus on Orang Asli community and schoolchildren in Selangor state and it can be expanded to all Malaysian’s Orang Asli community and to all the public in the future. OSO can enhance the learning of solar astronomy subjects especially in the classroom. It does not more than just facilitate telescope use: a comprehensive range of support materials and educational resources is available. In this paper presentation, we would like to show the OSO system and portal for solar astronomy learning program.

1. INTRODUCTION

Internet has changed the learning processes, knowledge acquisition and the interaction between the learners and the learned. Using internet by the Orang Asli without education might lead to unethical utilization and misinformation. However, using the internet to acquire the education and information will lead to understand and knowing what the Orang Asli should know as the use of other technology such as television set and hand phone is a common within the Orang Asli community that are near to the urban area [4].
Literature indicates a few researches have been studied involving the Orang Asli community but a dearth is found focusing on Information Communication Technology (ICT) education and internet usage among the Orang Asli schoolchildren [1]. The survey findings indicate most of the Orang Asli are familiar with computer and internet but the level of usage varies [1]. From the study by [2], it was found that ICT played an important role in sustaining Orang Asli’s cultural identity. These groups need the help of various parties, especially the government to ensure schools with Orang Asli children and community must be equipped with ICT facilities for them. Besides that, not all community or schools afford to have their own telescopes to do solar observation or participating in solar observation program at planetarium or science center [3].

Therefore, National Space Agency of Malaysia (ANGKASA) has taken initiative collaborate with National Planetarium (PLANET) and Department of Orang Asli Development (JAKOA) Selangor / Federal Territory to develop Online Solar Observatory (OSO) for solar astronomy learning program among Orang Asli schoolchildren and community through the provision of MOSTI Social Innovation Fund (MSI). OSO telescope system will use the existing facilities at the National Planetarium Observatory but with a little effort to upgrade the system. Via the OSO, Orang Asli schoolchildren and community can observe the Sun and study solar astronomy virtually where it can be accessed anywhere via the internet.

2. METHODOLOGY

The methodology of Online Solar Observatory’s development as below:

- Design and Build Content of Astronomy Educational Module
- Develop OSO System
  - Develop OSO Portal
  - Desktop Computer Installation for Orang Asli’s Communities and Schools
  - OSO Testing and Commissioning
  - Use of the OSO by Orang Asli’s Communities and Students in Klang Valley
3. RESULTS AND DISCUSSIONS

a. ONLINE SOLAR OBSERVATORY (OSO) SYSTEM

Online Solar Observatory (OSO) is an integrated system for streaming live view of the Sun which is placed in the National Planetarium Observatory with a diameter of 5m dome and automatic control systems integrated between the dome, the telescope and the camera system. OSO is equipped by two units of telescopes with Hydrogen Alpha and White Light solar filters that enable the public to observe the Sun directly. Both telescopes are placed on the Software Bisque Paramount ME Mounting System which is controlled by The SkyX Professional software. Two units of camera have been installed on the telescopes; therefore the surface of the Sun’s image will appear directly through the OSO portal.

OSO telescopes system comprising:
- Telescopes Takahashi FS-60CB FL355mm + RoboFocus + White Light Solar Filter + QHY-IMG132-E CCD Camera
- Telescopes Takahashi FS-102FSV + Robofocus + H-Alpha Solar Filter + QHY5P-II Color CCD Camera

![Figure 1: OSO Telescope System at National Planetarium Observatory](image1)

Besides that, OSO also equipped with all-sky camera to allow public to view the sky condition around the National Planetarium. Two webcams are installed in the Observatory to enable public to view the movement of the telescope system when in operation.

![Figure 2: Weather Station and All-sky Camera at National Planetarium Observatory (outside)](image2)
b. ONLINE SOLAR OBSERVATORY (OSO) PORTAL

Online Solar Observatory Portal can be accessed through https://oso.planetariumnegara.gov.my. Via this portal, Orang Asli schoolchildren and community can live view the Sun’s image, movement of the telescope system, sky condition and location of the Sun at National Planetarium. Introduction of the OSO system, the Sun’s information, and video tutorial regarding how to register and capture the Sun’s image through OSO portal also provided. They can view all the contents in the OSO portal without log in. They also can register as log in user if they want to capture and download the Sun’s image when OSO in operation. Log in users will need to answer feedback survey after they log out from OSO portal. This feedback survey will help ANGKASA to improve OSO project in the future.

![Figure 3: OSO Portal Homepage](image-url)

1. The appearance of the Sun is highly dependent on the weather conditions. The Sun’s image displays in the portal as shown in Figure 4 and Figure 5 below:

2. • The display image is derived from alpha-hydrogen (H-alpha), where you will be able to see the splendor of the sun (prominence) moving from the surface of the Sun and flare sun (solar flares) that usually appears near patches of sun large and uneven and sun spots.

![Figure 4: Prominence](image-url)
• The display image is derived from white light beam (white light), where you will see Sunspots on the surface of the Sun.

![Sunspot Image](image)

**Figure 5: Sunspot**

ANGKASA have installed six units of Desktop PC at SK Bukit Tampoi (Asli), Dengkil, SK Sg. Melut (Asli), Sepang, Kampung Orang Asli Sg. Melut, Sepang and Kampung Orang Asli Bukit Tadom, Banting to facilitate them in participating solar astronomy learning program. ANGKASA with the hope they acquiring sufficient knowledge and preparing them in the field of solar astronomy for enhancement of their teaching and learning activities in schools and community.

4. CONCLUSION

This OSO project is hoped to encourage and enhance Orang Asli schoolchildren and community in solar astronomy learning. It is hoped that OSO can be expanded to other Orang Asli community and schoolchildren in Selangor particularly and other states generally and finally to all the public in the future.

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