

Atayal Satellite: Attitudes of Indigenous People towards Satellite Basics and Applications

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Abstract: This paper presents the attitudes of the indigenous people towards satellite basics and applications before and after their participation in the learning activities associated with the project *Atayal Satellite*. The indigenous participants in the *Atayal Satellite* project and the authors both found the project extremely exciting. The participants were impacted in several ways. Participants' feedbacks reveal that participants have increased willingness to study science, as well as increased knowledge of satellite technology. Simultaneously, participants were trained to operate GPS equipment and generate their own thematic satellite maps for their tribal villages. A thematic satellite maps with detailed information including names of house holders, public facility, administration regions, and scenery spots were completed.

Introduction:

Many Taiwan indigenous people start the satellite application from satellite TV. Because the residents in mountainous regions where the indigenous population is concentrated receive poor TV signals, the Taiwanese government has invested in a geo-stationary satellite, ST-1 (SingTel-1), to relay seven national TV broadcasters in Taiwan. Each indigenous family living in mountainous areas has a right to apply to the CIP (Council of Indigenous People) to receive TV content from this satellite. Over sixty thousand indigenous families have benefited from daily access to TV in Taiwan since 1994. GPS receivers could help in this area, both by preventing visitors from getting lost, and by improving the efficiency of aboriginal rescue crews. Additionally, the use of GPS can give aboriginals increased chances to travel further a field when hunting or making other trips. Furthermore, GPS is an ideal tool for identifying specific spots in or making records for later reference or information exchange. Government agents started the applications of the satellite image in Taiwan since 1974. Twenty years later, National Central University received the first image from space in Taiwan. In personal use, the satellite images provide people the whole picture and

detailed information of the land they lived in (see Chang & Chang 2000). Unfortunately, the digital divide associated with satellites creates a barrier for indigenous people to use satellite technology in daily applications because they don't understand satellites and don't access terminals. Barriers to the application of satellites by indigenous people cause one of digit divides in Taiwan as listed in table 1. The applications of satellite technology should be extended to meet the actual needs of indigenous people.

Barriers	Knowledge on satellite	Facility (Availability)	Terminal (Availability)	Knowledge on operation of terminal	Digital divide
Satellite TV	No	SingTel-1(Yes)	TV(Yes)	Yes	No
GPS	No	GPS*24(Yes)	Receiver(No)	No	Yes
Image	No	Formosat-2(Yes) Internet(No)	PC(Yes)	No	Yes

Table 1: Application barriers of satellites for indigenous people in Taiwan

Since knowledge of basics and applications on satellite is urgently needed by indigenous peoples, under the request of the Swe-Te village, the *Atayal Satellite* project was proposed to bridge the gap on satellite technology and applications for indigenous peoples.

About the *Atayal Satellite* Project:

This project is an on-going pilot project supported by the National Science Council (NSC) to provide satellite-science outreach to an Atayal village in Taiwan. Goals of the project mainly include three folds:

1. Lectures of satellite basics given at an Atayal Presbyterian Church: Six lectures are planned. Operation of GPS and generation of thematic satellite maps are followed. More over, the learners are requested to be assistants for a satellite campus.
2. Two-day Satellite campus for students: Two-generation participation is welcome. Both indigenous and non-indigenous people will be invited for the same campus. They will be grouped in teams. Each team includes two generations, indigenous and non-indigenous people to complete assignments and study on satellites.
3. Attitudes of indigenous people towards satellite technology will be studied.

The Learning Activities of *Atayal Satellite*:

The learning activities of *Atayal satellite* includes two parts, lectures and hands-on. At the beginning, six topics were planned for the six lectures: Introduction to Satellites, Remote Sensing, Satellite Mission Planning, Space Environmental Test,

GPS Technology, Satellite Mapping. However, syllabus is continuously modified on observation of the responses of the learners. It turned out that more education medium, two ways communication and less one-way lecture were given as follows.

1. Practice activities were welcome more than lecture activities by learners. GPS receivers were prepared for learners to measure the coordination of the position of the class. After completion of six lectures, some learners asked to borrow two GPS receivers. They used the GPS receivers and tape recorders to visit the region of thousand-years-old trees for identifying the coordination and taping images of the trees.

2. Pieces of some famous movies related with imaging satellite and GPS replaced part of planned lectures. After the learners watched the movies, instructor and learners discussed about the satellite technology in the movies. The movies did trap highly attentions of learners.

3. Parts of education DVD related with satellites also replaced part of planned lectures. The session of questions and answers immediately followed. Once a boy was requested to ask a question in the class, he was so ashamed as not able to do at the first moment. With the encouragement of the instructor and other classmates, he asked a question at the next session voluntarily.

4. The participants of the class were divided into eight groups. Each group collaborates to draw a map and submit it in. A handy way to generate a thematic satellite map is to download satellite images from the web site of Urmapp, and use the Office Power Point as the drawing tool. Since computer center is not set up at the moment of writing the paper, the learners cannot be able to generate their own map on a computer. Instead, they marked the spots with color pen on the hard copies of satellite images. Even so, they were so excited to do the job for the first time in their life.

Attitudes of Indigenous People towards Satellite Applications:

To understanding the background of the participants, a questionnaire, including six questions related with satellite technology, was asked at the beginning of the first lecture. At the end of the sixth lectures, the same six questions were asked again to investigate the progress of learners on satellite.

Results of the two tests between the beginning and the end of six-lectures on the six questions are compared and three interesting results are observed as follows.

1. The scores of the end are significantly higher than the beginning. Scores is double from the beginning of the six-lectures to the end. It shows that the learners got significantly progress after the lectures.
2. The scores of male participants are higher than female participants: In general, men receive more education than women. Men have better sense on science.
3. The progress of women is better than that of man: Women were more promised to the class.

Additionally, an open question, about how and what the participants think about the *Atayal Satellite* learning activities, is included in the questionnaire of the end. Some feedbacks are as follows.

- It is wonderful to learn satellite basics.
- I was nervous in class and get better now. Hope to learn more and more. I will go for it.
- I become a “book-case with two legs”. I learned a lot, not only technology, but also common sense.
- I like the class. To learn technology helps development of tribe.
- I realized satellite from satellite TV before. I accessed satellite image and operated GPS in the class. I appreciate the instructor and assistant to help us to learn satellite through practice.
- I am more than 50 years old and got a chance to attend the class. It is very strange and exciting experience to attend the class. I appreciate it very much that the instructors gave us the lectures.

Results and discussions:

This paper presents the attitudes of these indigenous people towards satellite basics and applications before and after their participation in the learning activities associated with the project *Atayal Satellite*. The indigenous participants in the *Atayal Satellite* project and the authors both found the project extremely exciting. The participants were impacted in several ways. Participants’ feedbacks reveal that participants have increased willingness to study science, as well as increased knowledge of satellite technology. Simultaneously, participants were trained to operate GPS equipment and generate their own thematic satellite maps for their tribal villages. Some participants even borrowed GPS to measure the coordination of spots in the mountain after class. A thematic satellite maps with detailed information including house titles, public facility, administration regions, and scenery spots were completed by all learners. The location of blocking caused by typhoon KROSA in October 2007 was identified and the location of the landslide, which is illegally exploited, is clearly shown in a different color besides the blocking area as in (Fig. 1).



Figure 1: Satellite image of the tribe of Swe-Ten

Meanwhile, authors learned many lessons from the project. So, the author had a chance to modify the syllabus and adapt the course. The authors played pieces of movies or educational films and followed on a discussion activated the class. GPS operation hands-on helps learners a lot to understand satellite basics and applications. It is a good practice to draw on hard copy before draw satellite map on screen. Then, the learners will have better sense to generate one's own map using MS Power point on a PC.

At this moment, a two-day satellite campus for students is not provided yet. It is planned to take place in the coming summer recess of the school and to study more attitudes of indigenous people towards satellite basics and applications.

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