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Weblog as Learning Community for Supporting Astronomy Teaching in Thailand

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Abstract: Previous studies indicated that there were some difficulties of astronomy teaching in Thailand because of teachers' lacking of content and pedagogical knowledge. Building up some spaces for Thai astronomy teacher learning community may allow them to gain their knowledge and pedagogy about astronomy. A weblog (blog) as a web-based technology may allow Thai astronomy teachers' community to improve pedagogical knowledge and astronomy concepts through expressing and exchanging ideas interaction and collaboration, social networking and group work. This paper share ideas of provide weblog for learning community of Thai astronomy teachers. The knowledge of sharing in weblog may have implications for professional development of Thai astronomy teachers.

Keywords: Weblog, learning community, astronomy, pedagogy

1. Introduction

Astronomy is one of the key areas for citizens in the 21st century. It can play a unique role in facilitating education and capacity building of citizens in society; and in furthering sustainable development throughout the world (Percy, 1996; Plummer, 2006). Knowledge of astronomy can increase public awareness, understanding and appreciation of science and technology which are important in all countries, both developed and developing (Percy, 2005). Astronomy is a science that transcends cultures, has been prominent in the news in recent years, and can generate excitement in young minds as no other science can. Astronomy is useful for understanding other science and mathematics concepts, and for developing problem solving skills, which are important in our technological world (Lebofsky, Canizo, & Lebofsky, 1996).

Teaching and learning astronomy in schools is highly justifiable. It not only prepare individuals for becoming astronomers in the future but also prepares citizens as a new generation who have deeper understanding of science, the ability to think critically and be able to explain astronomical phenomena that occur in everyday life and are relevant to their culture and society. However, it seems that there are some difficulties of astronomy teaching in Thailand. Astronomy is just obviously appearing in both the 2001 and later the 2008 Thailand school science curriculum (IPST, 2008). Not many Thai school science teachers graduated in astronomy area. Some previous studies found that the cause of Thai students' misconception about astronomy was teachers' low capability in teaching astronomy. Teachers could not provide constructivist learning models or instructional media for astronomy (Khongpugdee, Sukonthachat, & Phonphok; 2009; Khongpugdee, 2010; Dahsah et al., 2012).

Building up some spaces for Thai astronomy teacher learning community may allow them to gain their knowledge and pedagogy about astronomy. Teachers are embracing technology as a way to increase instructional effectiveness and reach the 21st century learner. The Internet is currently applied in a wide range of e-learning settings, and various innovative web-based learning systems have been developed over the last few years. Numerous information technologies have emerged to support this type of educational environment, by facilitating communication and collaboration among online learners. Blogs, wikis, Facebook, and microblogs are all technologies in educational contexts in many studies (Cole, 2009; Huang, 2011; Robertson, 2011).

A weblog (blog) is a web-based technology that allows people to quickly share their thoughts and comments with the entire web population. Persons who are not necessarily familiar with web design codes (HTML, CSS) are able to successfully post an article with multimedia materials. This advantage has increased recent attention to pedagogical roles of blogs in the e-learning literature. Compared with other popular social software applications (wikis, online forums, facebook, and microblogs), blogs can be more applied more broadly, allowing simplified web pages, links, and resource collections (Huang, 2011). There were many studies using the blog for diverse learning groups, ranging from primary (Davis 2006, Tse et al. 2010) and secondary education (Angelaina & Jimoyiannis 2009) to higher education (Blau et al. 2009, Kerawalla et al. 2009, Tan et al. 2010) and teachers' professional development as well (Makri & Kinigos 2007).

Since 2010, The Technology for Teaching and Learning Center, under the Thai Ministry of Education every years training Thai teachers to create blog content through "wordpress" free blog service (URL: http://www.wordpress.com). Many teachers who attend in the workshop created blogs and used as effective strategies for teaching and learning in their class. Some studies show that students more satisfied and they was higher achievement after learning by using a weblog that applying with social media (Facebook, Google Docs, Slideshare, and Youtube) (Sudprakone, 2012; Anantasook, 2014). In addition, other teachers can use content from various educational blogs which some teachers designed, in their classroom. Because of their organizational and pedagogical features, blog for Thai astronomy teachers' community can offer enhanced opportunities to teachers, not only to improve pedagogical skills, but to construct new knowledge through expressing and exchanging ideas, critical and reflective thinking, interaction and collaboration, social networking and group work.

2. Weblog as Learning Community for Thai astronomy teachers

The weblog which concern in this study is astronomy education's blog [www.astroeducation.com], was started blogging in January 2013. The objective's blog setting was provided for teaching and learning on astronomy, astronomy education, in the Thai's basic educational levels (Grade 1-12). This blog consist of seven main menus; (1) author's astronomical activities, (2) news and announce, (3) astronomy lesson (4) astronomy knowledge, (5) learning medias, (6) astronomy curriculum, and (7) CERN physics teacher projects. These all menus and some articles are show in figure 1.

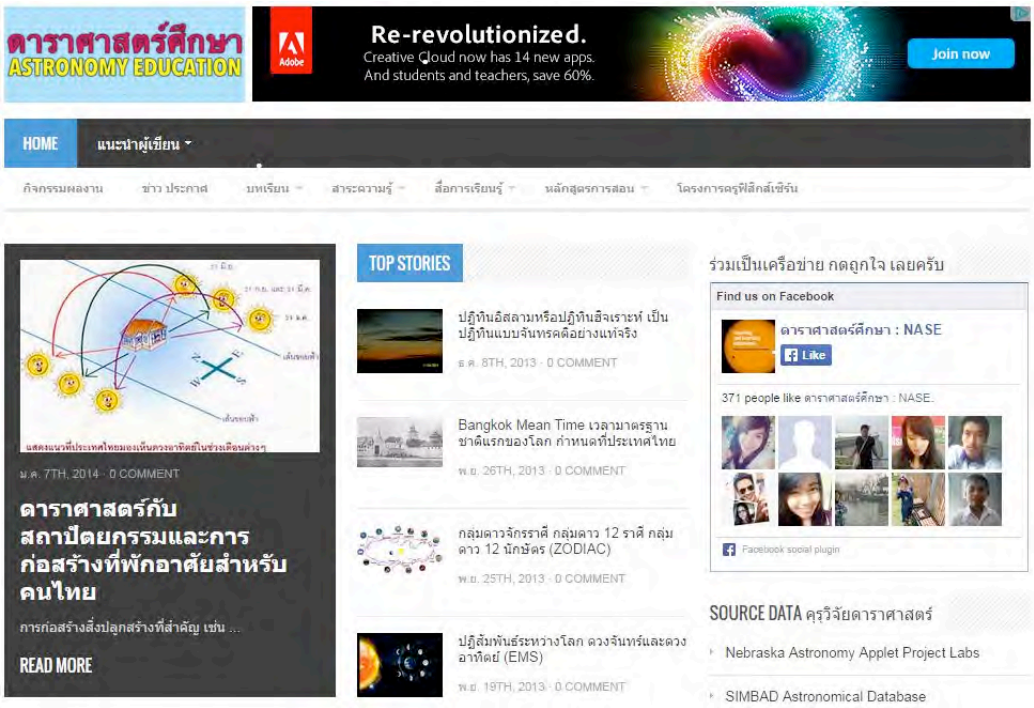

figure 1. The first page of astronomy education's blog [www.astroeducation.com].

The first author's astronomical activities menu includes the author's news or activities when he attended in the astronomy workshop and conference. For example, the author attend in the Eratosthenes workshop; measure circumference of the Earth on 25-27 March 2013, and the Institute for the Promotion of Teaching Science and Technology (IPST)'s workshop for astronomy teacher on 11-15 March 2013. The author present his research study in the title "The Poster for Archaeoastronomy and Geology of Prasats in Surin Province: the Learning Material" in the International Conference of Educational Research (ICER) 2011 on 9 November 2011.

The second news and announce menu that include the news of astronomy workshop or projects which many organizations such as the Institute for the Promotion of Teaching Science and Technology (IPST), the Thai Astronomy Society, The National Astronomical Research Institute of Thailand (NARIT) and The Learning centre for Earth Science and Astronomy (LESA), create activities for teachers who teaching astronomy.

The third astronomy lesson menu consists of two archaeoastronomy lessons. The first lesson was designed for enhancing learners' understanding on how the direction of 30 Surin province prasats' (Hindu temple) structure was provided in order to face to the East at the position of sunrise on Equinox day. The lesson provided the picture and detail of all prasats in term of age, purpose, material and direction of construction which were checked and survey by the author before created the lesson. The learning requires students to take action according to the guidelines for two hours in weblog class and one hour outside of the class. They were enthusiastic and interested in the group activity and knew more about Hindu temple that relevant to the movement of the Sun. The second lesson is the operation of measure circumference of the Earth on Vernal Equinox day. The author used the Eratosthenes method, and a difference technique for measure circumference of the Earth. Because of the Sun move on the Equator in the Vernal Equinox day. The author applied the Google Earth free online program for measured the distance from the participants' location to the Equator. In this part, the author created many articles while he stayed in New Zealand. Thai and Lao teachers and students (N=67) in difference locations, who submitted in this operation, learn the content from this part and successfully to measure circumference of the Earth on 23-24 March 2014.

The fourth astronomy knowledge menu that include several articles which wrote and post on the blog by the author. It can categories in two sub-menus; (1) the concept of time and calendar, (2) the concept of astronomy in daily life. This part benefits for person who interests on astronomy in Thai societal and cultural context.

The fifth learning media menu that involve astronomy media such as video clip, astronomy textbook, and free astronomical program that were shared on the internet. The author selected and categorized them which benefit for students and teachers in the basic educational level. This main menu includes three sub-menus; (1) video clips content for students, (2) video clips training for astronomy teachers, (3) astronomy textbooks and astronomical program.

The sixth astronomy curriculum menu that involve three sub-menu which link to the astronomy level in Thai science curriculum that include primary level, lower secondary level and upper secondary level. However, only astronomy lessons and learning material on the upper secondary level were stipulated in the first year. This menu can support both teachers and students for teaching and learning astronomy in their classroom.

The final main menu is CERN physics teacher projects menu. This part include particle physics knowledge from the European Organization for Nuclear Research (CERN)-Physics High School Teacher Programme which the author interest individually. This menu benefits for physics teachers who interests in particle physics laboratory and planning to attend in the CERN-Physics High School Teacher Programme.

3. Community Building of Thai Astronomy Teacher Weblog: First Year

The first year, it is good start for community building of Thai astronomy teacher weblog. Number of teacher access to the blog and teachers who become member in astronomy educations' fanpage [https://www.facebook.com/astroeducation] are increasing in everyday. The blogger normally post many articles in each menu but focus on the sixth menu. The author provides the astronomy learning material such as learning activities, learning packets, and lesson plans for teachers who teach astronomy content at the upper secondary level [http://www.astroeducation.com/category/curriculum/highlevel/]. All documents contain necessary information for teacher looking to start using it in their astronomy classroom. The blog is currently not many articles then it was visited around 200-250 visitors per day.

The community seems to consider in pedagogical knowledge. They usually come to the sixth menu, astronomy curriculum menu, through google search for using learning material for teaching. Then, they download all files by themselves or e-mail to the astronomy education blogger for send files them. Their communication was related to need of pedagogical knowledge as follow:

> *"I don't have any learning material, could you please send it to me."* Ketsaraporn [02/07/2013]
> *"Now, I don't have lesson plan, the plan for teaching astronomy, could you please send it to me. Thank you very much"* Pensriri kaewnongsong [22/11/2013]
> *"I am biology teacher, but I was assigned to teach astronomy in this semester, I Requesting assistance the astronomy learning plan from you."* Phacharanapat Boonseela [07/01/2014]
> *"This is the first time for me to teach astronomy, could you please send lesson plan and files of astronomy content to me."* Sririyakorn Jullee [19/04/2014], Rewadee chansamut [06/05/2014]
> *"I am a new teacher, I am lake the teaching technique. Could I receive your files."* Panida [30/04/2014]

It indicated that astronomy teaching had difficulty for them. They asked for learning materials or even lesson plan because most of them were first time to teach astronomy. Even some of them are not new science teachers, they are new astronomy teachers. This similar to previous studies found the problem of astronomy teaching in Thailand (Khongpugdee, Sukonthachat, & Phonphok; 2009; Khongpugdee, 2010; Dahsah et al., 2012). It could be mentioned that the contents in this astronomy education blog can support teachers for teaching and learning astronomy in Thailand.

4. Conclusion

The astronomy education blog could build Thai astronomy teachers' community up. First year of sharing in the blog indicated that teachers required not only pedagogical knowledge but also astronomy concepts. It is probably because most of astronomy teachers have no background of astronomy areas. The weblog may increase of providing media to enhance constructing astronomy concept. More interaction between experts and naïve astronomy teachers should be provided in order to set up the atmosphere of professional development through the blog.

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