European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available on-line at: www.oapub.org/edu

DOI: 10.46827/ejes.v10i2.4671 Volume 10 | Issue 2 | 2023

APPLICATION OF GOOGLE EARTH SOFTWARE FOR TEACHING STUDENTS OF GEOGRAPHY EDUCATION AT AN GIANG UNIVERSITY, VIETNAM IN THE DIRECTION OF CAPACITY DEVELOPMENT

To Minh Chau[i],
Tran The Dinh
Faculty of Geography,
An Giang University,
Vietnam
Vietnam National University Ho Chi Minh City,
Vietnam

Abstract:
Applying information technology to teach students majoring in Geography pedagogy in a university environment in the direction of capacity development has contributed to improving training efficiency and quality. By analyzing and synthesizing documents combined with pedagogical experiments in the classroom, the article introduces Google Earth and the application of Google Earth to teach some geography modules for students of geography pedagogy at the An Giang University, Ho Chi Minh City National University, in the direction of capacity development. Through lessons and tests, assessments help students improve their general and specific competencies in Geography. In addition, the article also proposes some recommendations to allow lecturers to use Google Earth to teach Geography at universities more effectively.

Keywords: Google Earth, capacity development, geographic pedagogy, An Giang University, Vietnam National University Ho Chi Minh City

1. Introduction

The 4th Industrial Revolution is taking place firmly along with the rapid development of science, technology, and information and communication, and the knowledge economy has created opportunities for Vietnam's higher education to continue access to new and modern educational programs for better development (Nguyen Cuc, 2017). The application of information technology, in combination with many forms of teaching such as face-to-face teaching, distance learning, and online education, has brought significant effects, contributing to improving the quality of teaching, helping teachers and Students

[i] Correspondence: email tmchau@agu.edu.vn

always have ideas to innovate teaching methods in the direction of promoting the positivity, initiative, and creativity of students (Trinh, 2018).

The use of spatial technologies became more widespread internationally after the launch of the World Wide Web in 1991. Almost one in six people globally used the Internet in 2009 (Chalmers, 2009). The rapid development of science and technology has brought new opportunities in education worldwide and in geography education in particular. Textbooks, blackboards, globes, and paper maps have been the main tools used in geography lessons for centuries. Since the advent of Google Earth, users can view small images and maps of the Earth's surface using satellites and store spatial data, from landmarks to street-level landscapes (Lisle, 2006).

GE is a web-based program, and it was launched in 2005 with many special functions, valuable and handy for teaching students majoring in Geography Pedagogy at universities. Because Google Earth can show the territory of all countries in the world with clear borders, it can help determine the area, circumference, and distance of objects in reality quickly. Google Earth also can zoom in and out of any point on Earth to display in a detailed spatial extent with higher resolution. Because essential Google Earth services are free and accessible online, the number of users has proliferated and reached more than 200 million by 2007 (Google, 2007).

Geography is a science subject with enormous scope, associated with maps and actual images, so students have a specific view of the problem being studied and researched. Using Google Earth to teach some geography modules for students of Geography Pedagogy in the direction of capacity development will diversify teaching forms and methods. Thereby helping students improve their activeness and initiative in learning in the order of capacity development.

2. Research content

2.1. Teaching in the direction of developing learners' capabilities

Competence is applying knowledge, experience, skills, attitudes, and interests to act appropriately and effectively in diverse situations (Vietnamese Ministry of Education and Training, 2014).

Some characteristics of the capacity:

- Having the influence of a specific individual on a specific object (knowledge, social relations) to have a specific product, thus distinguishing one person from another.
- Competence is a constitutive element in a particular activity. Competence exists only in the movement and development of a particular activity. Therefore, competence is both a goal and an outcome.
- Refers to the tendency to achieve an inevitable result of a specific job performed by a specific person (learning ability, thinking ability, self-management ability), so there is no generic capacity.

Capabilities can be classified into general and specific competencies.

- *General competencies:* are basic, essential, or core competencies as the foundation for all human activities in life and professional work. Some core competencies of high school students are autonomy and self-study, problem-solving and creativity, communication, and cooperation.

- *Specific competencies:* These are the competencies that are formed and developed based on general competencies in a specialized and specialized orientation in different types of activities, jobs, or specific situations and environments needed for specialized activities that meet the narrower requirements of an activity such as math, sports, geography. Some specific competencies in Geography, such as geographic science cognitive ability (receiving) understanding the world from a spatial point of view; explaining geographical phenomena and processes); capacity to learn geography (using geographic tools; organizing fieldwork; exploiting the Internet for the subject matter); ability to apply learned knowledge and skills (updating information and making valuable contacts; implementing learning topics and discovering from practice; applying geographical knowledge to solve some practical problems). Teaching to develop learners' competencies directs learners to develop their abilities, such as creativity, abstraction, thinking, and analysis. In order to contribute to the formation and development of personality for learners (Vietnamese Ministry of Education and Training, 2014).

2.2. Exploiting Google Earth to teach some competency-oriented geography modules

2.2.1. About Google Earth

Google Earth is a globe simulation software on Linux, MAC OS, and MS Windows. Currently available for Android and iOS devices. Google Earth provides search capabilities and the ability to locate, measure distances, zoom (zoom in), rotate, and tilt views of the Earth. It also provides tools for creating new data and displaying information on the Google Earth desktop interface. Google Earth comes in three versions:

Free version: this is a version for home and personal use. This version has many features, including satellite and airplane image display and a set of data layers that can be displayed as maps mapping, third-party data visualization capabilities, including tools for creating new data, and the ability to import GPS data. Free versions of Google Earth can be used in schools, and Google has created a Geo Education website to provide helpful information on how to use Google Earth, Maps, Sky, and SketchUp in the classroom. Higher education institutions can also install free versions for non-commercial use.

"Pro" version: This version was developed for commercial use, allows import of ESRI MapInfo shapefiles and tab files, can measure circle and polygon areas, and can print and save high-resolution images.

Enterprise version: This product processes images and geospatial data differently for employees in corporate organizations.

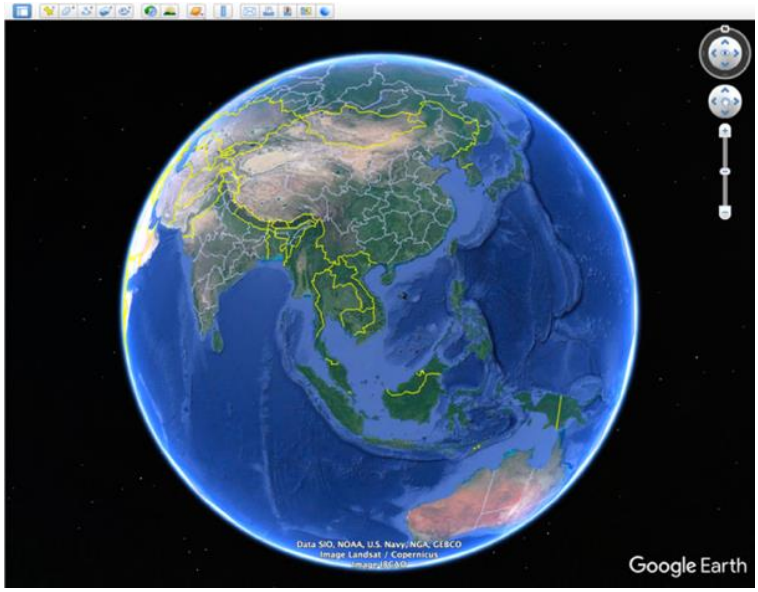


Figure 1: Google Earth interface

Instructions for downloading and installing:

Step 1: Go to the website to download Google Earth. Select "Agree and download"

Step 2: Open the uploaded file. Select Run

Step 3: The program will automatically install. When the installation is complete, select "Close" to finish.

Software manuals:

In the search box, enter the place you want to find > Click Search to conduct the search > Roll the mouse wheel up and down to zoom in and out > Hold down the left mouse button and drag the mouse to rotate the image > Hold down the mouse wheel and drag to change the angle of inclination > Select the yellow human figure > Click and hold the left mouse button and drag the figure to the position you want to observe > To return to the original, select Exit Street View.

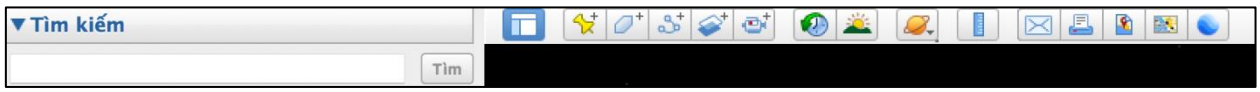
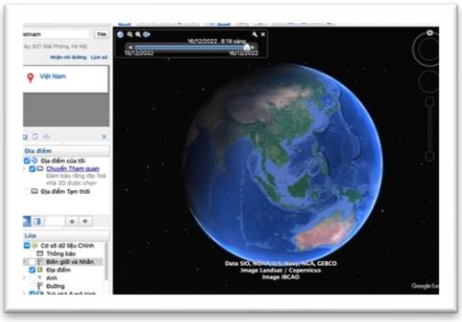


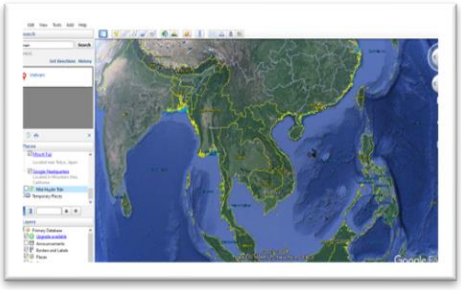
Figure 2: Google Earth search box and toolbar interface

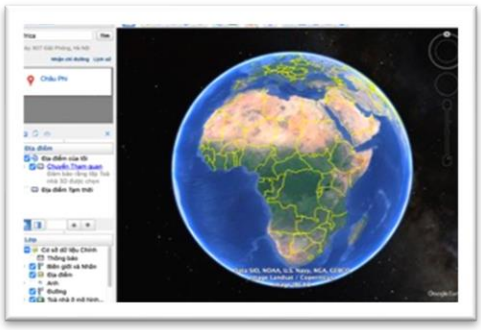
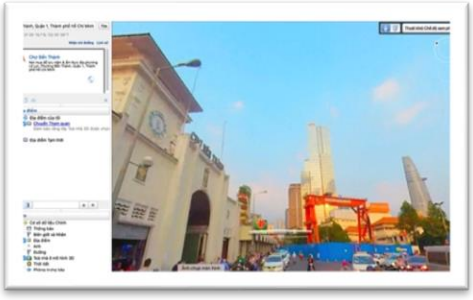
We can refer to more functions of Google Earth from the website: https://www.google.com/intl/en/earth/

2.2.2. Applying Google Earth to teaching some geography modules in the direction of capacity development

Table 1: Suggestions for some subjects applying Google Earth in the direction of capacity development

No.	Applied course	Google Earth Feature Application	Competencies are formed	
			General competencies	Specific competencies
	Earth science	**Features to learn sunlight changes** Using the Sun tool in View > Sun allows the user to use the slider on the left side of the screen to see the time change, not the day change. Students can see how sunsets and sunrises unfold. The magnetic darkness disappears when the Sun appears on the horizon, and light rays will illuminate the entire area. This feature is used to reframe natural knowledge as very intuitive and vivid. 	Competencies to use information technology. Competencies to work individually.	Competencies to observe, read and use maps. Competencies to analyze and synthesize information.
	Earth science	**Space exploration feature** Users can look up at the sky on Google Earth with the Sky option. This is like looking at a virtual star in the virtual world; the user can move around in the sky and can move around the Earth, double click to zoom in on the galaxies. Users can see actual space images from NASA, and their scientific names will be labeled on the screen. 	Competencies to use information technology. Competencies to work individually.	Competencies to observe, read and use maps. Competencies to analyze and synthesize information.
	Socio-economic	**Find a location by region, country, or place**	Competencies to use information technology.	Competencies to observe, read and use maps.

	geography of the world	*Example 1:* find the location of Vietnam on the map - Instructors and students use the search function -> enter Vietnam -> will find the location. Then use the mouse with the scroll button in the middle to zoom and the left mouse button to move to see a close-up to indicate the geographical position and territorial limits of Vietnam. *Example 2:* find the location of An Giang University on the map - Lecturers and students use the search function -> enter An Giang University -> will find the location. - Instruct students to use the editing feature on the toolbar and then choose to copy the image to save it as a document. 	Competencies to work individually and group.	Competencies to analyze and synthesize information.
	Tourism geography	**Distance calculation feature** Online maps allow users to determine distances, but generally, it only calculates the main route. It does not identify bends in the road so the accuracy may be low. Using Google Earth, online satellite maps are more carefully calculated. In Google Earth, users can do this by going to Tools -> Rulers. 	Competencies to use information technology. Competencies to work individually and group.	Competencies to observe, read and use maps. Computational capacity.
	Socio-economic geography of the world	**Observing and analyzing the topography of countries** *Example 1:* Students can observe the overall geomorphic features of Japan and its islands from above. Thereby, students can comment and analyze the characteristics of	Competencies to use information technology.	Competencies to observe, read and use maps.

		terrain types to see the relationship with other natural and socio-economic factors. Students open Google Earth -> Search -> Japan-> use the scroll bar and mouse pointer to observe the topography of the Japanese islands.	Cooperation competencies	Competencies to analyze and process documents. Comparative assessment capacity.
	Natural geography of the continents	**Observe and analyze the natural features of the world's continents** *Example:* When teaching lesson "African Continent", the teacher asks students to open: Google Earth -> Search -> Africa. Then students observe the features of terrain, coast, and rivers and analyze, compare and draw knowledge for themselves. Observing and analyzing the topography of countries 	Competencies to use information technology. Cooperation competencies	Competencies to observe, read and use maps. Competencies to analyze and process documents. Comparative assessment capacity.
	Natural Geography of Vietnam	**Observing and analyzing socio-economic objects** When teaching lessons: The southeast region, lecturers let students use the Google Earth tool to search for some industrial centers on the map, such as Ho Chi Minh City, Ba Ria Vung Tau, and Bien Hoa, thereby showing the level of industrial concentration in this area. The lecturer asks students to open: Google Earth -> Search -> Ho Chi Minh City, Ba Ria Vung Tau, Bien Hoa. 	Competencies to use information technology. Cooperation competencies Pedagogical communication competence	Competencies to observe, read and use maps. Competencies to analyze and process documents. Comparative assessment capacity.

3. Conclusions and recommendations

Google Earth software is an effective tool used in teaching geography in general and World socio-economic geography in particular, which needs to be maintained and developed. Geography is a science associated with using maps, images, and models of geographical objects along with their characteristics to make learners' acquisition more comprehensive and realistic. Google Earth application to teach world socio-economic geography to students of Geography Pedagogy, An Giang University, Vietnam National University, Ho Chi Minh City, has promoted the initiative and creativity of students, contributing to innovation, improving the effectiveness of the training process specialized in Geography Pedagogy. The results of applying Google Earth to teach World Socio-economic Geography show that students are more interested in studying and love Geography Pedagogy. As a result, the Geography Pedagogy students' class time is less dry and more realistic. The midterm and final exam results also achieved high scores. Besides, thanks to the preparation of lectures using Google Earth for teaching, teachers have the opportunity to expand their knowledge and be more creative in the teaching process, contributing to improving their professional qualifications. Some recommendations and suggestions:

1) To prepare and design lecture content for the World Socio-Economic Geography module to teach students majoring in Geography at An Giang University, Vietnam National University, Ho Chi Minh City. Using Google Earth software requires the lecturer's time and effort. Teachers must love their job, always learn to improve their professional capacity, and apply information technology to innovate methods and apply Google Earth to their teaching.
2) Regularly training and fostering more information for lecturers in information technology to change thinking about teaching methods in the direction of capacity development in the new period. The lecturers must also improve their information technology skills to design lectures with the Google Earth application.
3) In teaching Geography modules with the Google Earth application, lecturers need to conduct student assessment tests in many forms. Exercises can be multiple-choice questions, essay questions, and especially practice exercises with the Google Earth application (locating countries, regions, coordinates, actual length, and terrain types). This helps teachers understand students' ability to absorb knowledge and thereby collect information to effectively adjust their lesson design, teaching methods, and organization.

Conflict of Interest Statement
The authors declare no conflicts of interests.

About the Authors

To Minh Chau is a Master of Geography. The author is working at An Giang University, Vietnam National University, Ho Chi Minh City, Vietnam.

Tran The Dinh is a PhD in natural Geography. The author is a working faculty of Geography at An Giang University, Vietnam National University, Ho Chi Minh City, Vietnam.

References

Chalmers L. (2009), Virtual spaces and networks in geographical education and research. *International Research in Geographical and Environmental Education*, 18(4), 239–244.

Google (2007), Introducing Google Earth outreach. Google, Inc. Press Release. Retrieved from https://googlepress.blogspot.com/2007/06/introducing-google-earth-outreach_26.html

Google (2022), Google Earth Pro for PC. https://activephanmem.com/google-earth-pro/

Julie, M, & Todd, G (2018), Using Google Earth and Satellite imagery to foster place-based teaching in an introductory Physical Geology course. *Journal of Geoscience Education*,10-20. https://doi.org/10.5408/10-203.1

Lisle, R. J (2006), Google Earth: A new geological resource. *Geology Today*, 22(1), 29–32.

Nguyen Cuc (2017), Impact of Industrial Revolution 4.0 on higher education institutions in Vietnam and policy implications for Vietnam. *The Journal of Educational Theory*, Number 8.

Todd, C. P (2007), Google Earth as a (Not Just) Geography Education Tool. *Journal of Geoscience Education*, 145-152. https://doi.org/10.1080/00221347001678032

Trinh, C. T. K. T (2018), *Using Google Earth in the design of geography 10 lessons oriented towards capacity development.* Master thesis. Thai Nguyen University of Education, Thai Nguyen, Vietnam.

Vietnamese Ministry of Education and Training (2014), *Training materials for testing and evaluation in the teaching process in the direction of developing students' abilities in high schools.*