

Using Understanding by Design (UbD) Framework and Modeling with Concept maps, Spreadsheets and Hypermedia in EFL lesson plan design

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Abstract: Since 2006, the Ministry of Education and Training (MOET) in Vietnam has required all the grades in high school to use new sets of textbooks in all subjects. In addition, the MOET also requires schools to “reasonably use ICT in every subject, avoid ICT abuse” (MOET, 2008, p.3) to improve the quality of education. Many workshops were organized to instruct teachers how to use the new textbooks and technology. In teaching English as a Foreign Language (EFL), teachers have tried to shift from the traditional methodology to the progressive methodology, which emphasizes a communicative approach (MOET, 2008). However, teachers still have difficulties of how to teach English to meet the new trend. This paper provides three 10th grade lesson plans as examples of adopting the new textbook, Understanding by Design (UbD) framework and ICT with concept maps, spreadsheets and hypermedia to activate students in classrooms.

Introduction

Wittgenstein indicates that “*Communication* is the foundation of all social life” (as cited in Hall, 2002, p.2). In communicative activity, each individual brings with them their own linguistic resources and social identities. These linguistic resources could be interpreted and understood via social cultural contexts. Linguistic resources, social identities and socio-cultural contexts help identify the goals to accomplish a communicative activity. (Hall, p.7, 2002).

The National Standards for Foreign Language Learning in the United States Project (1995) set five goals for language learning: communication, culture, connections, comparisons, and communities in which communication is the core. Acquiring a language is not just acquiring language linguistic resources. Rather, it is “to develop understanding and participate in a wide range of intellectual and practical communicative activities realized through the target language (Leontiev, 1981 in Hall, p 19, 2002). Therefore, learning a language should be context-embedded in which the goals are developed through three modes: the interpersonal, the interpretive, and the presentational modes (Hall, p.19, 2002).

To successfully acquire communicative goals in language learning, learners and teachers should adopt *appropriate learning theories, the lesson design framework and techniques and principles of language learning*.

According to cognitivism, learning is considered not just mere stimulus-response association only but an active cognitive processing. This approach indicates that meaningful learning involves understanding the relationship between facts and principles, and students will learn best when they have a “schema- an internal knowledge structure” that allows them to link the new knowledge to the existing knowledge in their mind to make it meaningful (Mergel, 1998, n.p). Jean Piaget (1896- 1980), one of the prominent cognitive theorists, emphasizes two functions of cognitive learning, organization and adaptation (Kristinsdóttir, 2001). Organization refers to the fact that the new knowledge must be integrated in the existing knowledge. Adaptation- assimilation or accommodation happens when the new knowledge does not fit. Therefore, it is implied that the teacher should consider the student’ cognitive structure, their knowledge and experience. Piaget also suggests an educational content that is familiar enough to assimilate but challenging enough to create the motivation for cognitive activity (Kristinsdóttir, 2001). He advises that the teacher should be aware of the child’s stage of cognitive development and his psychology when he/she thinks of designing learning activities. In addition, the teacher should create an active learning environment that facilitates the child to construct the knowledge.

The most influential learning theory category is the constructivism. Constructivists believe that students learn best when they construct their knowledge (Kristinsdóttir, 2001). Jerome Bruner (1915-present), a representative of constructivism with the approach “Discovering Learning” argues that “Practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving” (Bruner, 1961, p.26). He is also a person who suggests the “spiral curriculum” (Good & Brophy, 1986, p. 207). This curriculum allows the student to bring more different insights to the topics that they already learned before. In this way, the student is able to broaden and deepen his/her knowledge about the existing concepts and then he/she is motivated to receive more new knowledge. On the other hand, in classroom, the teacher will become a facilitator to guide students to explore and discover knowledge.

Besides, some theories and approaches that have influenced the contemporary directions of teaching and learning are of John Dewey, Lev Vygotsky and Howard Gardner. John Dewey proposes that the child is the center of any learning and teaching design of activities. In addition, he believes in learning by doing (Dewey, 1998). On the other hand, Lev Vygotsky indicates that “social interaction plays a fundamental role in the development of cognition” (TIP, 2009, n.p). Howard Gardner, with the theory of multiple intelligences implies that teaching/learning should focus on the specific intelligence of each person; therefore, learning activities should be designed in a broad diversity and with great appeal to encourage students to use their preferred intelligences in learning (TIP, 2009).

After considering the learning styles of students, it is necessary to define which *lesson design framework* helps meet different learning styles of various students. *Understanding by Design (UbD)* is a curriculum framework model which suggests designers consider more carefully the desired results and the evaluation of student’s performance and achievement. In this way, this design helps teachers to solve the twin sins in teaching: “activity-oriented design” in which the teacher designs learning activities without aims, and “coverage” in which the teacher covers all the content in the textbook and transmits it to the student (Wiggins & McTighe, 2005, p.16). UbD is a curriculum design that starts with the desired outcomes in mind, it is called the “backward design” (p.17). The process has three stages: “Identify design results”, “Determine acceptable evidence” and “Plan learning experiences and instruction” (pp. 17, 18).

Prior to designing the curriculum, the designer should firstly consider the goals of the curriculum concerning the enduring understanding and their expectation towards their students. Therefore, designers should examine the goals of national/district/school standards and know how to set the content priorities in teaching. In the second stage, the designer is advised to collect the assessment evidence (both informal and formal types of assessment) so that they know to what degree students attain the desired result. In the last stage, with the clear goals and appropriate assessment evidence, the designer creates learning activities, including knowledge and skills, which allow students to attain the desired outcome. In this stage, the designer also pays attention to the materials and resources necessary to help facilitate student’s learning (Wiggins & McTighe, 2005). This backward design is a major difference from the traditional design in that while traditional design creates the assessment at the end of the lesson to evaluate student’s learning- a kind of testing for assessing, backward design addresses the assessment evidence as a way of making the goals more concrete and make the learning activity more meaningful- It is actually a type of assessing for learning.

The following is the UbD: Backward design template

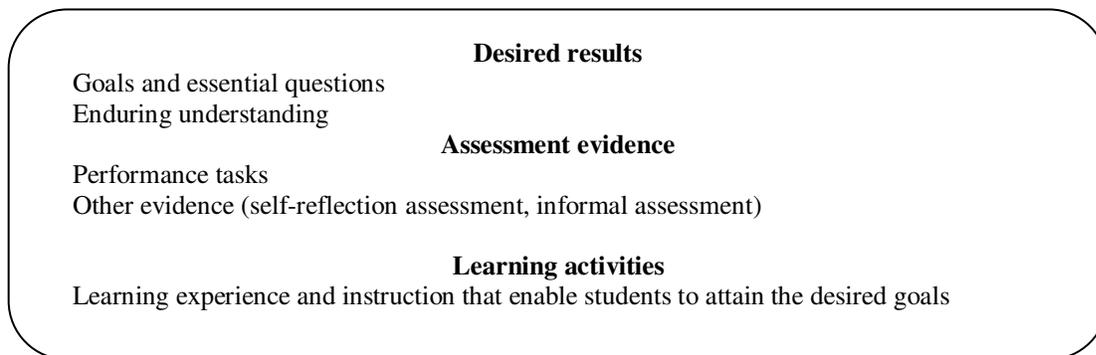


Figure 1: UbD: Backward design template (Adapted from Wiggins & McTighe. [2005]. *Understanding by design*. Virginia, USA: ASCD).

After setting the objectives, and setting the type of assessment and assessment evidence, it is necessary to consider what *method(s) or approach(es)* the teacher should use in the classroom to help students attain the desired result as well as help teacher to collect assessment evidence. In language teaching, there are the Grammar-Translation Method, the Direct-Method, The Audio-Lingual Method, The Silent Way, Desuggestopedia, Community Language Learning, Total Physical Response, Communicative Learning Teaching, Content-based, Task-based, and Participatory Approaches, and Computer Assisted Language Learning Method (CALL). To meet students' need in English competence in Vietnam, it is necessary to emphasize the Communicative Learning Teaching, Task-based Approach, and CALL over the other methods/approaches. However, the teacher should be flexible in using the methods.

To support students to reach the expected outcome, *ICT* plays an important role. Since 1960s, like the other fields, education has been influenced by the computer dramatic development. In general, technology achievement requires schools to change the overarching objectives so that students, after finishing school, are able to be engaged in the technology transformation age (White, 1987). Particularly, technology contributes to the process of transferring from the traditional methodology, which is teacher-centered, into the more progressive one, student-centered. For instance, instead of receiving one-way information from the teacher, in computer-based classroom activities, students can do projects, exchange ideas and they gradually become the subject of the learning process. By doing meaningful work, the student is able to enhance his/her problem solving and critical thinking skills, which are very important in the information age.

Therefore, the computer can be used for the following purpose: “tutor, tool, or tutee” (Wiske, 2005, p. 139). As a tutor, the computer is the teaching machine which promotes learning through the drill-and practice activities in tutorials. As a tool, the computer can work as the same functions of the books, typewriters, calculators, and so on. In this way, the computer is able to assist the student to explore the knowledge from a different angle. Regarding the computer as the tutee, the student and teacher become the producers of technologies, which serve the user's purpose. They are no longer the passive recipients (Wiske, 2005).

In terms of curriculum design, technology can be integrated into curriculum to improve its effectiveness, or can be added to the existing curriculum as when the computer classes are included in the school programs, or can become a “*transformer*” of the traditional curriculum when some classroom activities cannot be implemented without the curriculum (Wiske, 2005, p.140). However, any decision of the computer application and curriculum design should be based on the clear responses to the “fundamental educational questions: What should students come to understand? How can learning be promoted and assessed? What role should technologies play in these matters?” (Wiske, 2005, p.4). Therefore, the curriculum, in the information age, should provide “opportunities for integrated, collaborative, multi-disciplinary study” (White, 1987, p. 15).

As mentioned above, technology plays a significant role in classrooms, and especially in learning activities. Technology works best when the teacher uses it not only for replacing the blackboard but for creating effective learning activities. In addition, it works best when the student uses it not only for making their work proceed more rapidly but for augmenting the meaningful work which contribute to their understanding the knowledge.

In the beginning of Modeling with Technology, Jonassen (2006) asserts that model constructing is one of the most effective strategies that support student's “intentional learning, conceptual engagement, and conceptual development” (p. xix). In technology era, learners can use variety of *computer-based modeling tools* to construct their models of domain knowledge, systems, problems, experiences, and their thinking. Among modeling tools are concept maps, spreadsheets, and hypermedia.

Concept map is a kind of “semantic network” in which “nodes (concepts or ideas)” are connected by “links (statement of relationship)”. Concept map, a type of “structural knowledge” helps comprehension and retention of ideas such that it connects “declarative knowledge” (awareness of objects, and ideas) to “procedural knowledge” (use declarative knowledge in problem solving) (Jonassen, 2006, p. 102). At school, students can use concept maps in many subjects, such as Literature (relationship among characters in a story), Languages (origin of vocabulary), Language Art (brainstorming ideas), Mathematics (relationships between factors in a theorem), and so forth. Integrating concept maps in classroom requires teachers to set specific goals and tasks for each activity. In addition, teachers have to provide support for students to identify key concepts and make links. Students are also trained how to use some mapping tool pages such as www.inspiration.com , www.mindmeister.com or simply the drawing tool in Microsoft words. Concept maps should be combined with other follow-up activities such as presentation and discussion.

Concerning *spreadsheet*, it “is a grid of empty cells with columns identified by letter and rows identified by numbers” (Jonassen, 2006, p. 117). The information included in any cell can be texts, numbers, formulas or functions. Spreadsheets have three main functions: storing, calculating, and presenting information. In addition, spreadsheets also provide other operational functions which make it easier for information updating, formulas

change, or function replication. The advantage of spreadsheet construction is to enhance users to identify relationships, and provide the implications beyond such relationship. Therefore, building and analyzing a spreadsheet requires the “abstract reasoning” (Jonassen, p. 120). Spreadsheets are often used as a managing tool; however, recently, they have been used as mindtools in some subjects such as math, chemistry and social studies. As in the implication of concept mapping use, spreadsheet use should be followed by some activities such as presentation and reflection.

Another form of modelling is *hypermedia*. Jonassen defines hypermedia as simply “the marriage of multimedia and hypertext” (p. 185). Multimedia is described as “the integration of more than one medium into some form of communication” (Lengel &Lengel, 2006, p. 167), and hypertext is a “non sequential, nonlinear method for organizing and displaying text (Jonassen, p. 185). Simply, hypermedia is the combination of many elements such as texts, animation, video, audio, external links, and other applications. At school, hypermedia has traditionally been used as a means of transmitting knowledge to learners. However, based on the constructivism approach which focuses on student’s problem-solving skills and their constructing knowledge, it is advisable for teachers to create an environment in which students become “hypermedia authors” (Lengel &Lengel, 2006, p. 171). Students can explore knowledge, search information, collect ideas and build their own hypermedia knowledge bases. This activity permits students to enhance their creativity and individuality, and develop their cognitive flexibility, and reflect on their communication strategies (Brown, 1998). In addition, while constructing hypermedia, students also learn collaborating skills, and information evaluating skills. Needless to say, hypermedia building brings students more learning insights. In reality, creating a favorable environment in classroom for this activity is not easy at all. It requires resources, teachers’ efforts, community’s supports and so forth.

Research methodology

This paper synthesizes different knowledge on language learning approach, learning theories, lesson design framework and the role of ICT in teaching and learning EFL. In addition, it provides UbD framework based lesson plans, using modelling with concept maps, spreadsheet and hypermedia in EFL classroom. The implication is to answer the questions:

- Can modelling with concept maps, spreadsheets and hypermedia add value to the lesson designed based on UbD framework?
- What are the implications of combining UbD framework and technology in lesson design?

Findings

Examples in using modelling in EFL classroom

Setting

These examples are designed for the EFL tenth grade teachers. I use “backward design” (Wiggins & McTighe, 2005, p. 17) and standards for Foreign Language Learning: Preparing for the 21st century (ACTFL, 2008) as the core rationales, performance- based and portfolio assessment as the key types of evaluation, communicative approach, reading/writing workshops as the main activities, the new English textbook as the main material, and technology as the main facility.

The unit “Cities” is among the 16 units that 10th grade students have to study in English class. Each unit have 8 periods (6 hours) to complete. The setting of this unit is the 10th grade EFL class in Dang Huy Tru High School which is located in the suburb of Hue City, Vietnam. The school year is from 5th September until the end of May. There are 40 students per class. The school encourages to use technology in teaching and learning to improve the quality of education. However, teachers have to cover all knowledge in the assigned textbooks because final exams are based on the knowledge in the textbooks. Students are quite familiar with Internet search tool, basic Excel basic PowerPoint, but have not used them for a specific learning task before. However, they are very excited about learning with computers. Teachers are familiar with technology tools but do not familiar with creating problem-solving activities in ESL class.

Lesson plan

Unit 14: CITIES

Time allotted: 8 periods

Goals

- Students will use their understanding of the city to write the introduction of a city and to plan a tour around the city.
- Students will learn about the structure of two types of relative clauses, and subordinating clause with “although”
- Students will learn how to work in pairs/groups.

Essential questions

- Do you enjoy traveling?
- What do you want to know about your destination?
- How could you describe a city?
- How is a tourist guidebook/webpage important to your choice of destination?

Understandings

- There are many ways to know about a city.
- Multimedia project is a way to expose your understanding.
- Revising makes the writing better; collaboration makes the work better.

Assessment evidence

- Tour around New York City- Students will plan a three-day tour around New York City
- City introduction for a tourist guidebook- Students will write a passage to introduce a city
- Spider map: Students sketch out some places/things that they would love to explore in NYC
- Graph: New York- a diverse city: Students search data of languages/populations
- Observation, pair work
- Portfolio
- Self-evaluation questionnaire, peer evaluation on final project presentation

Learning activities

- Reading: Spider map, how to scan the text
- Speaking: How to ask and answer?
- Listening: How identify key words
- Writing: City introduction for a tourist guidebook
- Convention: Non-defining and defining relative clauses, although
- Performance task: Three day tour around NYC
- Presentation: Three day tour around NYC

Materials/resources

Assigned textbook, 10 computers per class with Internet connection, 1 projector+screen, 1 blackboard, 1 wireless mouse and keyboard.

Lessons

To prepare for the performance task as mentioned above in the unit plan. The teacher conducts the following lessons
Lesson 1: Technology Practice (Students get familiar to some presentation and brainstorming ICT tools such as PowerPoint, Mindmapping, Microsoft Excel, etc)

Lesson 2: Spider Map- Brainstorm ideas- What do you want to know about New York?

Lesson 3: Spreadsheet- Go beyond the text- New York- a diverse city

Lesson 4: Hypermedia- Tie together- A three day tour around New York

In this finding, the lesson 2, 3 and 4 are introduced.

Lesson procedure is based on the lesson structure of English- Language Art. There are 5 stages:

- **CONNECTION:** Connect to what students have learnt or connect to their experience, introduce a new learning strategy.
- **TEACHING:** Teachers shows how to grasp the new learning strategy.
- **ACTIVE ENGAGEMENT/ QUICK TRY:** Students try the new strategy.

- **LINK:** Teachers ask students try the new strategy to understand the text.
- **CONFERENCE:** Students work in groups, using the new strategy to the new text.
- **SHARE:** Students reflect on their learning process, present their work.

LESSON 2:

Topic: Spider Map: What do you want to know about New York?

Time allotted: 45 minutes

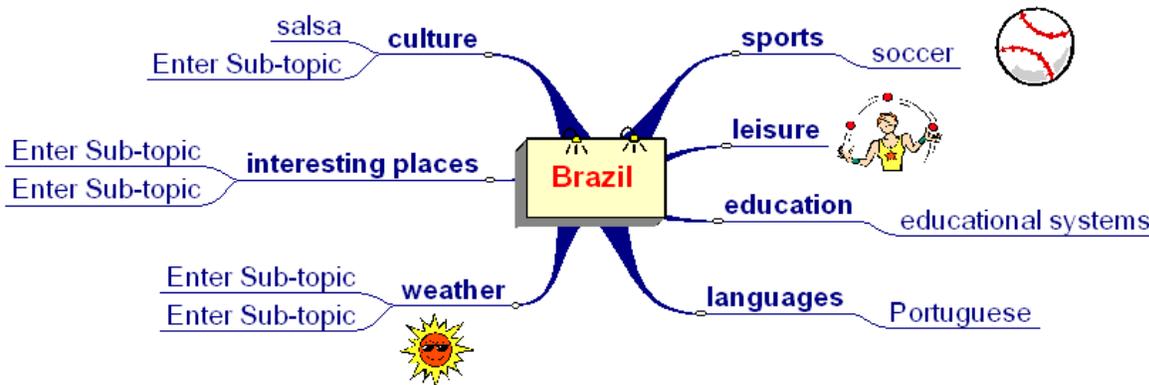
CONNECTION

Students, when you would like to visit somewhere, you often wonder how it is, if there is any interesting places there, how the food is, so on and so forth. However, after the visit, you find out that you do miss something: You cannot answer all the questions that you had in your mind before. Today, I am going to help you “stick” to your questions during your trips by using a Concept Map which I call “a Spider Map”

TEACHING POINT

I am going to show you how to use Concept map for my visit to Brazil, the home country of Pele, whom you learnt about in previous unit. I will use the mindmapping software, like eMindmap as a concept mapping tool. *(Teacher opens emindmap software)*

(Teacher explains: Please look at how I use emindmap to brainstorm ideas on Brazil. First of all, I type “Brazil” at the center. Then, I start to add main topics that I would like to explore in Brazil such as culture, sports, interesting places, etc. Next, more detailed subtopics are added to each main topics. I could add pictures to illustrate the topics.)



ACTIVE ENGAGEMENT/ QUICK TRY

So if you go to Brazil, what do you want to know more? Let us add your ideas to the above mindmap.

LINK

You see, a concept map helps you to brainstorm your ideas and connect them in some ways. Now, before you read a text on New York City, let us have you work with your partner and use the concept map to generate what you want to know about New York City.

CONFERENCE

(Students work in pairs, discuss and make the concept map).

SHARE

I see some of you have come up with many interesting ideas about New York City. Could you share with the whole class how to use the concept map to generate ideas?

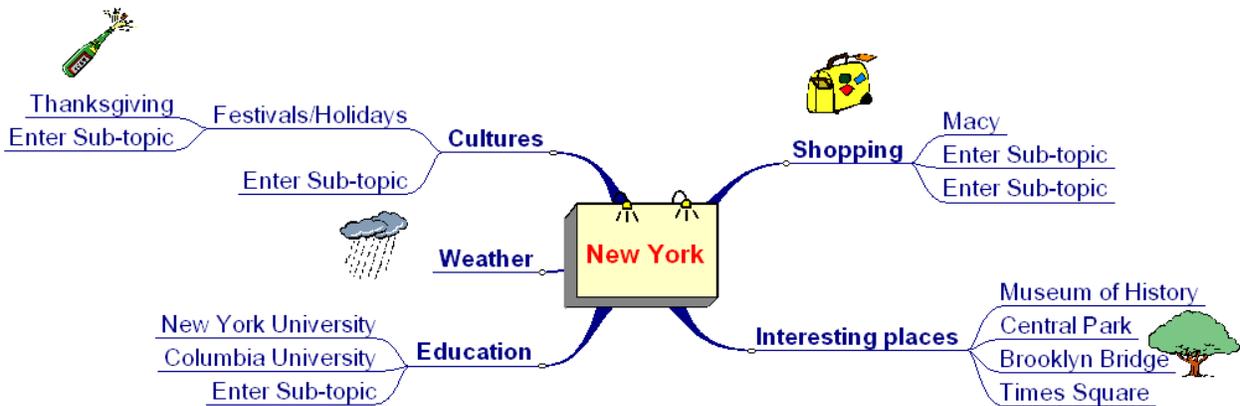
(Students share their concept Maps.)

Now, you are going to read a text about New York City. You can use the information in the text to complete your map.

HOME WORK

At home, use the Internet to search the information you miss on the map. Here is a hint for you: Go www.google.com, type the key word: New York City, and then, it will lead you to many pages about New York.

Expected Concept Map:



LESSON 3

Topic: Using Spread Sheet- Go beyond the text -New York- A diverse city

Time allotted: 90 minutes

CONNECTION

In the text last week about the World Cup, there was a sentence: “World Cup [...] is considered the most popular sporting event in the world”. So you may want to know how popular World Cup is compared to other sports. Today I am going to show you how to use Internet and Spreadsheet to get more information.

TEACHING POINT

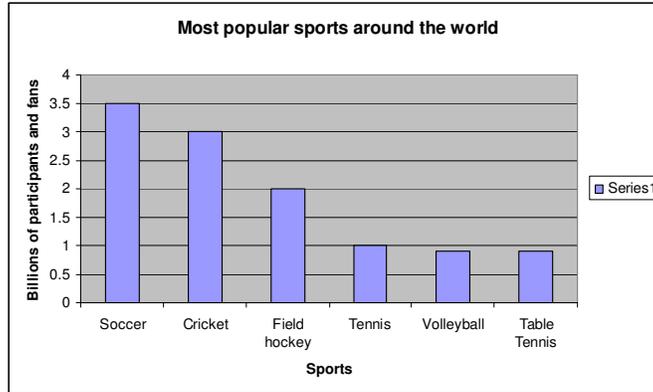
Let me show you how to search the information about the popularity of soccer and other sports.

Firstly, go to www.google.com, type: *world most popular sport ranking*. There will be many pages that appear.

Secondly, I will choose the page which more credible (that means correct information on professional sports). Let see: <http://ezinearticles.com/?Most-Popular-Sports-Around-The-World&id=551180>. Thirdly, I will read it to find out the information. Then go to Excel to fill information, as follows: *(Teacher opens Excel and instructs)*

Sports	Number of participants and fans (billions)
Football (soccer)	3.5
Cricket	3
Field Hockey	2
Tennis	1
Volleyball	900
Table tennis	900

Mark the table. Click Insert- Chart. Choose the chart, complete the information and click Finish.



ACTIVE ENGAGEMENT/QUICK TRY

Now, please try to use Spread Sheets to compare the most popular sports around the world and the most popular sports in US. You can use different types of charts.

LINK

Spreadsheet helps you picture and compare the popularity of some sports around the world and in US. In addition, it helps you understand the text deeply. So, work in group of four, and try to go beyond the sentence: “New Yorkers are people who come from all over the United States and many countries of the world.” Remember to find what you want to know beyond this sentence, decide the key words to find out documents around it and use Excel to do spreadsheet.

CONFERENCE

(Students work in group. Teacher goes around for supports.)

SHARE

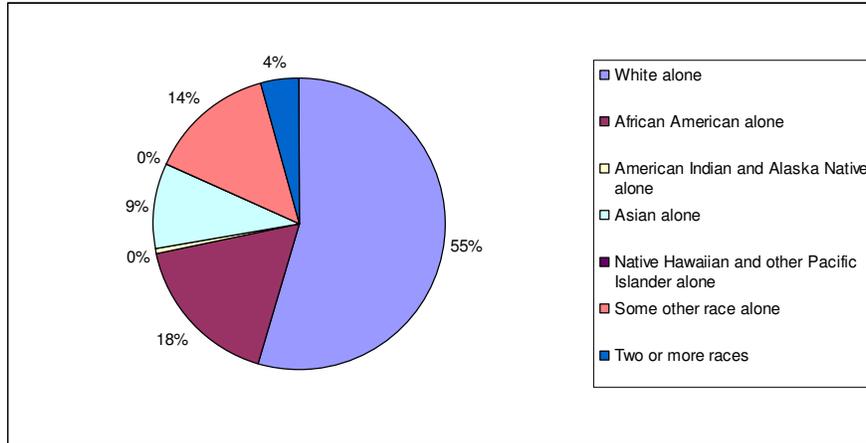
I see many groups have created many interesting charts, some about languages, others about the diverse people in US. Will you share them with the class?

HOMEWORK

Search number of the Kinh ethnicity and other minority groups in Vietnam. Use Spreadsheet to compare them.

Expected work for conference:

White alone	835610
African American alone	267302
American Indian and Alaska Native alone	7617
Asian alone	144538
Native Hawaiian and other Pacific Islander alone	1069
Some other race alone	217383
Two or more races	63676



Statistics from <http://factfinder.census.gov/>

LESSON 3

Topic: Take a tour around New York

Time allotted: 90 minutes

CONNECTION

You have known how to use concept maps and spreadsheets to broaden your understanding about the text. Today, we are going to try hypermedia to create a tour around some places.

TEACHING POINT

For example, I would like to design a three- day- tour around our home city, Hue. See, look what I will do. Firstly, I use concept map to brainstorm what in Hue I want to include in the tour. Then I design a day to day schedule. Then, I find the information, pictures, video about Hue. Lastly, I create a slide show on PowerPoint of the tour.

(T shows students the final product- a page on Hue (include pictures, video, basic information, link to the tourist guide))

ACTIVE ENGAGEMENT/QUICK TRY

Let us take Hoi An town as an example. Create a one-page slide show. Make sure to include some basic information, pictures and others if you want.

LINK

So you already know many things about New York. Now, you are going to design a three day tour around New York, using hypermedia. You will work in groups of 4, and make sure to divide work among members. Include some pictures and/or video in the slide show.

CONFERENCE

(Students work in group. Teacher goes around, checking student's work and provides help in need.)

SHARE

Students present their work.

HOMEWORK

Write about what you have learnt about New York in your Writing Log Entry Book

Discussion and conclusion

The paper addresses different perspective on language learning approach, learning styles, lesson design framework and ICT, especially modelling with concept maps, spreadsheet and hypermedia. It already provides some examples

of using modelling in EFL classroom. It is important to note that the effectiveness of a lesson depends upon appropriate lesson design framework and lesson plan. Different ICT tools also influence the effectiveness of the lesson. Concept map helps students to brainstorm and categorize ideas. Spreadsheet helps students illustrate their understanding in graphs. Hypermedia is an effective tool to demonstrate their synthesized knowledge. However, a lesson is successful only if the teacher considers all aspects of teaching and learning process, such as learning approaches, learning styles, and technology integration. In the way forwards, these examples will be experimented in teaching practice.

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