

Designing an Exciting Self-Regulated, Indigenized and Rhizomatic Courseware Environment

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ABSTRACT

One of the many challenges of a developing country like the Philippines is the lack of local content materials particularly in the primary school. The response to this situation was to design a rhizome-inspired piece of courseware for the Makabayan Social Studies course that covers geography, history, lifestyle and information about the different regions. The courseware was intended to become the primary resource material for the subject, to use local content and local “Tagalog” dialect instead of English, to provide ease in the understanding of the many related facts and information in the course, and to fuse the concepts of social roles in a community.

The instructional design went through an in-depth analysis of the nature of the course, how it can adopt a rhizomatic structure and how it can be designed to provide indigenized social role incidents. Cognitive multimedia was carefully selected as a basic theory for enhancing the comprehension and recollection of the different facts in the course.

The innovation in the design was to anchor the theories to rhizome models and to create a rhizomatic environment that enhances self-regulated learning among students and better comprehension of the ecosystem of facts in the Social Studies course. The rhizomatic environment was augmented by strategies such as storytelling, geographic interactive maps, social agents and assessments through time-bound games.

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1. INTRODUCTION

One of the many challenges of a developing country like the Philippines is the lack of local content materials and access to quality technology infrastructure including the internet. This situation has been evident in the Jaime Hilario La Salle Integrated School that is a *mission school* in the town of Bagac in Bataan, Central Luzon. The school is created to cater to the children of the fishermen and farmers in the area. The school is managed by the Lasallian brothers and is presently serving a small population of elementary students in a five hectare area surrounded by a protected forest and situated near the sea. The school relies on donations coming from the private schools. While there are few computers, the site does not have a telecommunications setup. The school materials are also inadequate. The headmaster or the principal of the school sought to find answers to these educational challenges.

This broad picture of the challenge became a welcome opportunity to design a learning technology solution. But there were other things to be considered. Apart from the limited computers, lack of Internet, limited textbook references, there were five important elementary subjects under discussion—the Sciences, Mathematics, Filipino, English and Social Studies, locally labeled as the Makabayan subject.

In 2002 the Department of Education of the Philippines aimed to revitalize the educational system through the introduction of lifelong learning skills through the Restructured Basic Education Curriculum

(RBEC). [1] This led to the determination of five subjects that will serve as tool subjects and will anchor the RBEC to development of lifelong learning skills. One of these five tool subjects is the Makabayan Social Studies course.

The Makabayan course is a mixture of various subjects such as Geography, History, Civics, Home and Livelihood Education and Arts for the elementary school. It is a learning area intended to provide exposure on practical knowledge, life skills and appreciation of the Filipino culture. So the Makabayan course has turned to an assortment of values, community and culture education on one hand, and an informative learning area that deals with geography, history and economics on the other hand.

Makabayan has been characterized by many facts to be remembered such as demographics, geographic and topological information, history, festivals, important industries, products, culture and lifestyle. The subject has many facts and information so that students perceive it as overwhelming and demanded heavy memorization of the facts that led to lack of interest among the students. In the teaching process, given the many topics, there is the problem of passivity and the inability to cover all the regions in the discussion.

So the pertinent problems faced by this situation are the following: *the subject is facts-and-memorization heavy that leads to lack of natural interest on the subject, lack of interactivity in the teaching process, inability of the teacher to cover all the topics in a school year, and the lack of educational resources in the mission school.*

How can we reinvent the Makabayan Social Studies subject to make it exciting and support recollection of many facts? How can we solve the passivity of the subject that delves on a variety of topics? How do we introduce practical life skills and facilitate social role formation at the same time build the ecosystem of the social studies topics to support the teaching process? How do we enable students to develop strong interest in learning a subject that deals with local information, local culture and at the same time develop lifelong learning skills?

Our present times permit and encourage a student to perform her learning activity in various ways—in a formal setting like the classroom where she listens to the teacher or carry out a task together with her classmates; in an informal setting like the home where she exchanges interesting stories with her siblings; or from a non-formal source like Youtube where she watches how to make a poached egg. Such variety of ways of getting different pieces of information to permit her to construct a personal knowledge simply exhibits that learning takes place in many circumstances and in different milieus. So each of these incidents or settings represent a rhizome.

“A rhizome refers to the ways in which learners traverse networks of representations of knowledge as they go about their learning” [2] be it formal, non-formal or informal. While most knowledge networks would have hierarchical configuration, observance of order, balance and unity, the inherent complexity of our modern world now pushes the shift to a rhizomatic arrangement. [3] The concept of this network of knowledge representations in a rhizomatic fashion is also very much congruent to more collaborative or peer learning and associations.

So a rhizomatic structure is the free, self-directed movement taken by the learner in constructing her personal knowledge in different facets and situations together with the different tools and sources of information contributing to knowledge creation. Such movement is organic and leads to the conscious construction of one’s personal learning environment. The model encourages autonomy, underscores purpose and openness and is congruent with collaborative networking.

Thus the heart of this project is to judiciously design a courseware and build a learning environment characterized by rhizomatic movement, and an organized ecosystem of subject information to support interactivity, self-regulated learning while introducing practical life skills and facilitating social role formation.

2. RESEARCH METHOD

The framework of the courseware (see Figure 1) exhibits a combination of models and design considerations in layers. The framework also exhibits that the layers on top of each other would construct the view of a rhizomatic environment.

A rhizome as a structure is open-ended, a set of nodes connected by lines of different length, may increase in lines or nodes or lines and nodes at different times. Each of the nodes could be an opportunity of knowledge creation or an environment of knowledge building. The nature of the rhizome is attractive to building small and multiple networks and “that a rhizomatic structure should not be thought of as chaotic but rather as a self-regulating structure responsive to the learners’ needs as determined by the mechanisms in place. [4] So a learner has a tendency to move and increase knowledge production in one direction or multiple directions at any given time. Making the learner more mindful of her learning incidents and

capabilities, making her define her personal learning environment, makes her more capable of increasing the rhizome lines of her learning. [5]

In this case, the rhizomatic structure can be observed in two ways. First is through the use of the Philippine archipelago map. The map's geospatial details are very relevant information that served as the take off point and the core of the rhizome structure. The map itself is a rhizome of islands that can be broken into smaller networks of topics. The map permits movement to different parts of the courseware that enables learner's autonomy and choices of learning situations. Second, the Makabayan Social Studies has been characterized by many related specifics and there has to be an organized way of introducing this information in an open and non-sequential yet unified manner. The facts were arranged and categorized into big and small topics where the big topics were further decomposed and the supplementing activities were grouped into social interactions and game assessments. An example of a big fact is Physical Characteristics that is broken into land and bodies of water. The land type is decomposed as mountain, hill or farmland.

The framework also shows important considerations in the courseware design.

a. The understanding of the Makabayan Social Studies subject. This constituted the range of metadata associated to the topics—the geographic and topology information, the history, civics and lifestyle, the produce and the industries. There was also the need to fit concepts such as social roles and pragmatic living that are considered as part of a Filipino culture.

b. The prudent selection of instructional design models. The cognitive multimedia and the component display theories were carefully selected to make a thoughtful inclusion of the multimedia element to be used. Cognitive multimedia is based on the idea that humans are capable of accommodating different types of information at a given time, that the brain works as a receiver of information in different channels and that the brain has a way of selecting the information that will be useful or needed. [6] Component display theory is a model that suggests cognition is enriched if the information details are classified into its associative nature such as facts, concepts, procedures and principles. [7]

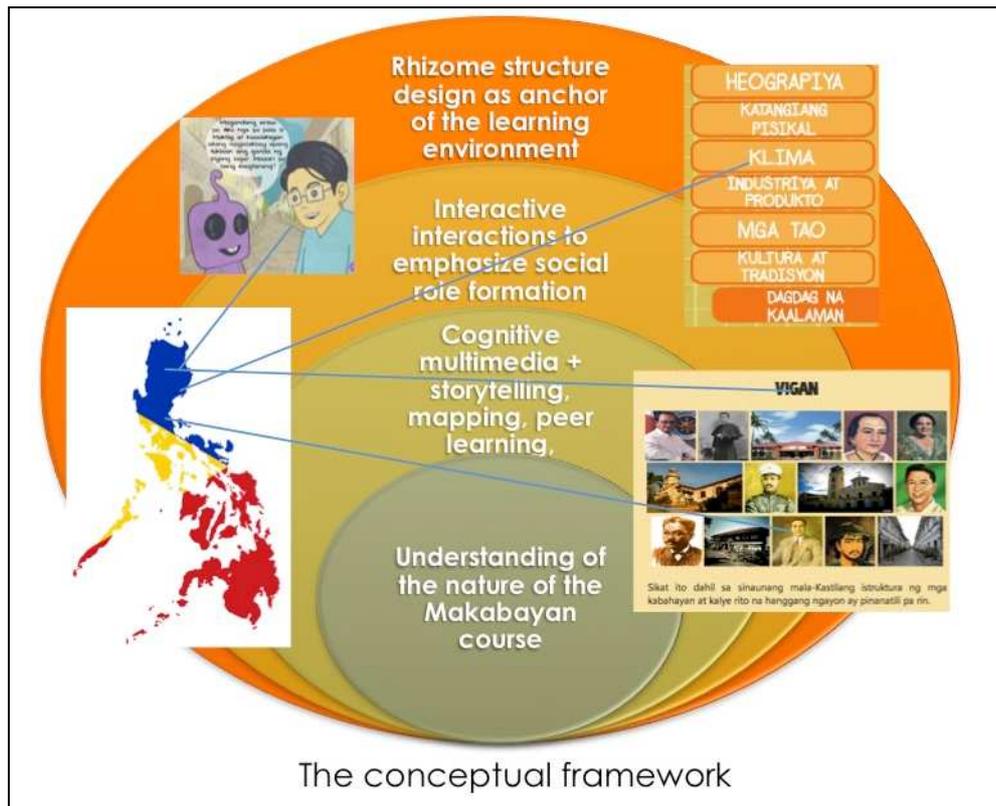


Figure 1. The rhizomatic conceptual framework

c. Specific strategies were fused to make the courseware interesting and exciting.

 <p>Figure 2. The alien Makiby</p>	<p>1. Storytelling. Storytelling was deliberately used as a technique as it functionally facilitates the introduction of social roles. It had also smoothly opened the courseware with the story of the alien Makiby who landed on earth. Comic format of storytelling was used. Storytelling is an effective tool to engage the learners and that storytelling is an effective technique that makes learning contextual. [8] Storytelling also supports meaning making episodes in the context of social roles. For example, when the alien Makiby traverses to the different regions, the alien encounters a local person who could be a farmer, a teacher or a local Mayor. These encounters provide short incidents exposing the students to real social roles in the local Filipino community. So this approach indigenizes the context.</p>
 <p>Figure 3. The peer learning setup</p>	<p>2. Peer learning. This technique was employed to address the limitation on the available computers. The setup would have four to five students using one computer as they navigate through the topics. The exploration of the assigned topics would be a negotiated interaction among the young students.</p>
 <p>Figure 4. The use of color of codes, shapes and icon symbols for land and mountains.</p>	<p>3. Mapping. Visual geographic maps broken down into parts accommodated by colors and legends were employed.</p>
 <p>Figure 5. An example of the game assessment</p>	<p>4. Game assessments. Quick lesson review encapsulated in different game facets were also designed to encourage retention of what was absorbed by the students and to enhance the peer learning in the process.</p>

d. Social roles in the Filipino cultural context was inculcated to give a wider exposure to the students view of the differences in culture, geographic location, language and living styles of the Filipinos. In essence, the students would have their own meaning and understanding on the diversity and multiculturalism of the Filipinos.

3. RESULTS AND ANALYSIS

a. On the Courseware Design

Building the topics in a web-based non-sequential manner went through series of brainstorming exercises. The archipelago map was helpful to unify everything. The bigger topics had to be broken down and be organized into a set of independent links too. Each link represented a category. The richness of the information in each category was dealt with according to the diversity of each of the towns or places. The approach revolved around the concept of using a zoom lens to drill down in the different places and then navigating around the map like a traveler, seeing the world through the eyes of the alien social agent.



Figure 6. The use of the map provides an effective way to drill down the different towns or regions.

The alien as a social agent became an effective instrument to uncover what was to be learned and to discover the social roles engaged in by the Filipinos.

The selection of the cognitive multimedia and the component display theories by the instructional designers anchored the deliberation of the sourcing and use of local content materials, use of colors, maps, amount of text details and the motivation behind the alien character and the encounter with the other social characters.

Following a series of studies by Andrew Peter Lian who developed frameworks for exploiting rhizomatic structures, *macro-simulation* (a long-term simulation which engages learners at all levels) provides a working environment designed to offer alternatives to students and embolden them to make choices, to devise ways to acquire knowledge and even, eventually, to strategize and organize their learning. [9] Such macro-simulation space would animatedly warrant creativity, passion and choices. [10] This macro-simulation space is also an arena of rhizome interaction and knowledge creation opportunities.

In retrospect, the courseware is an example of a macrosimulation environment that is characterized to provide many choices on what or where and how much to acquire at any given interaction incident. Multimedia has evidently stimulated the students' interests to acquire more information as evidenced in the testing stages. The unified yet decentralized distribution of the topics, the drill-down approach and free navigation movement made the courseware very rhizomatic as it did not follow a lesson-sequential approach typical of traditional content materials.

What the courseware cannot evidently perform is to provide opportunities of devising ways to acquire or exchange knowledge, to critically reflect on the choices they choose and to show evidence that the students are organizing already their own learning.

How the students contemplate on the different social roles presented through the alien's encounter is something that will have to be judged in the long term. However, in practical terms it raises awareness among the students of the existence of such identities in the Filipino culture.

b. On the Courseware Evaluation

The courseware was developed using Adobe Flash over a span of five months and covered all seventeen (17) regions of the Philippines. The courseware went through rapid prototyping with regular consultations with the Social Studies teachers.

Two major user acceptance tests were conducted. The first testing focused on a topic that has been familiar to the elementary students. The second testing led the students to a topic they had not covered in the course. The user acceptance tests were complemented with a survey, a qualitative questionnaire and interviews right after the use case of the software. The survey instrument in the test evaluated the instructional design, the content, the interactivity, the media element used, the interface design and the functionalities. There were 28 respondents. The top two ratings were instructional design, which was 88% and the interface design which was 92%. The lowest rating is interactivity at 68%.

The final version of the courseware was presented simulating how it should be delivered in class, with the students in small groups. The level of participation was very high. The observations, captured on video, were very satisfactory as marked by their responses and participation in the group discussion. The students also exhibited great enthusiasm and peer interactions in using learning software like this.

The head of the Makabayan Social Studies teaching team gave high approval of the courseware. She was very willing to undertake the next phase, to roll out the courseware in the next batch of incoming grade five students.

The analogy of learning the topics in small groups and interacting with peers even with the limitation of the computers follow the minimally invasive education of Sugata Mitra. [10] No hole-in-the-wall structures were made but a courseware designed to give much freedom for students to interact, confer and explore the topics. In practice, as it was observed, conversations and elated participation among students had been evident because of many things—the localized content, the rich multimedia and the sharing of information taking place between the peers. Some students were so happy to know about the southern regions because these were for them faraway places that they had not seen.

While the use of surveys are deemed useful to uncover audience' perceptions, it is the belief of this study that interviews and group discussions are more effective in eliciting perceptions in the Filipino context. Hence, many of the aforementioned feedback were gathered from the post user testing where the participants expressed their experience as it had just happened.

4. CONCLUSION

Attempts to construct a rhizomatic playground of content choices, cognitive multimedia, Filipino social roles and encounters, and presenting an ecosystem of related information for the Makabayan Social Studies subject in a rhizome yet organized arrangement were all successfully achieved. This strategy of rhizomatic design and development can be very much replicated in other attempts to create macro-simulation learning environments to enhance agency, empowerment and independence with an interplay of peer learning.

The courseware also provided opportunities of peer learning among the students. Results of the user tests would evidently point to increased interest on the Makabiyah course and the courseware content triggered more interactions among the students. The next step would be to embed reflective choices, to provide opportunities of information exchange and organizing their individual works among students.

The Makabiyah Social Studies courseware is an educational resource that can be used not only in mission schools but also in other poor schools in the Philippines.

While many trends seek to move education in a global perspective, this study still banks on the significance of providing baseline understandings of an individual's cultural identity through indigenized local content materials. It is in this way that the individual transcends her present condition to understanding the bigger world outside herself on the basis of an appreciation of what her small world might offer.

Lastly, this research serves as a reference literature to further personal learning environment studies.

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Present undertaking: Formed a small ASEAN Team with Dr. Andrew Peter Lian of the Suranaree University of Technology, Thailand, to pursue researches on Personal Learning Environments. The team currently has members from the Philippines, Thailand, Vietnam and Sweden. Some notes on its work can be found here: <http://pleandrhizomes.net/>

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