Active Learning Pedagogy

A new teaching methodology for a new generation of teachers

by

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Abstract:

Active learning methodology has become a preferred way to change the traditional teacher centered classroom into the newer student centered approach to learning. Little development, however, on the pedagogy of active learning or the assessment of student retention using active learning methodology is available in the literature. This paper addresses how active learning can support the conceptual development of the learner. How can an active learning methodology be implemented to assure that a student learns through the techniques established in active learning but taught within a new pedagogical framework?

Teaching styles which take advantage of each student's unique way of learning will also be emphasized using cognitive activators. These cognitive activators are a pre-set of activities which prepare the student to learn independently when given an activity requiring the use an active learning technique. Cognitive activators and cognitive domains will be described in an active learning pedagogy cycle.

Introduction:

The future is here and it is time to address the new world of knowledge acquisition and present that world to students who will then be prepared to understand the way knowledge is interconnected forging a new generation of students who can lead their country, manage the complexity of their society and give to their lives an appetite for life long learning. The standards required from students in today's world demand that a teaching methodology can be implemented to assist students to enter the world that is being flooded with innovation at a rate inconceivable only a few years ago yet predicted by all people in the knowledge profession. The information age is dependent on how to access data and make meaningful decisions with what is brought to the learners attention no matter in what form of display device may be invented to convey that data. The active learning methodology has become an acceptable teaching technique in this new learning environment by instilling in students a sense of self discovery without sacrificing the basic tenants of educational taxonomy or a rigorous understanding of the foundation and development of the academic disciplines the student may be studying and need to learn. The processes a teacher must follow in order to encourage self learning is essential in the formative stages of the learning process and is dramatically different than a teacher based delivery system.

The active learning techniques which are now being introduced in the classroom are a synthesis of many learning methodologies which have been tested and incorporated in many programs to impart the knowledge which a student must learn. The application of learning technologies coupled with active learning methodologies in a progressive classroom will be the norm rather than the exception as the active learning

methodology is more fully understood. Today, learning technologies are primarily centered around the laptop computer for access to the many levels of information which exist and can be acquired easily though a pre-designed list of resources coupled with the ability to be able to search independently for those resources. Incorporating active learning into the matrix of these newer learning technologies is an on-going development with IT centers and Language Centers.

The requirement to learn how to use information technologies is the specialty of the IT professional, however, in the field of language education there are teacher training techniques which are the specialty of the language teacher. These two fields need to be linked, and active learning is a perfect teaching model that can be utilized by both the IT professional and the language professional.

The goal in learning a second language is to have the student be able to reason and express ideas that are part of the structure of that second language. In the English language the complexities which the language presents to a learner as well as the ability to use the technology of computer based skills in retrieving data is a double problem that has to be integrated into the lesson plan by the teacher.

It is safe to say that the two disciplines of computer based skills incorporating data acquisition skills along with language skills are going to be with a student's career for the rest of his or her life. Therefore, it is prudent and wise that we as educators consider how to incorporate these two disciplines into the foundation learning skills of the student and continue with these skills through their primary and secondary education. Once in the college environment these skills will be the standard skills necessary to integrate and understand the new knowledge that is being uncovered and incorporated into all fields of study. The skill necessary to learn knowledge

acquisition using the computer is based on hypertext or link strategies and search strategies .i.e. developing associative skills. The skills necessary to learn the English language is a contextual skill whereby the student learns English as it is used in specific situations. How best to illustrate these two skills using an active learning pedagogy is the theme that will run through this paper.

Developing a pedagogy for an active learning methodology is the challenge facing educators all over the world. It comes as no surprise, therefore, that the active learning methodology has become one of the more preferred ways of teaching because it stimulates the students into self exploration and expression. The many techniques of active learning have had wide exposure over the last few years and the techniques are readily available for study on the internet. The basic change that's taking place in learning methodologies is changing the focus from a teacher centered classroom to a student centered class room. Although this definition has been accepted from a wide spectrum of educators as the direction education should go the planning and development of a pedagogy as well as a curriculum to utilize student based learning techniques has not been as well developed or agreed upon.

The National Education Reform Act of 1999 of Thailand outlined the need to institute Active Learning and critical thinking in the Classroom. It was felt that this approach would encourage a Life Long Learning (LLL) process and also help students with their cognitive skills, which was also referred to as soft skills. These soft skills it was reasoned would encourage critical thinking, problem solving and task based learning skills within an Active Learning environment.

Unfortunately there was little preparation given to the teachers to implement a student based learning environment so scores on tests over the last few years in Thailand have dropped rather than increase. One reason offered for the low scores of students was that when the teachers left the student on their own to do their lesson plans based on a self learning strategy the teachers had no training as to how to prepare for this type of teaching technique in having the student be more active in their learning behavior. The situation is so severe that the Vivat Study Group chairman MD Boon Wanasin is even suggesting that Thai citizens contribute in rebuilding the Thai educational system and developing Thai children to be able-bodied and able-minded adults in the future (Wanasin 2009).

This dire situation has been addressed with Phase II of educational reform introduced in August of 2009 called a “Blueprint for a Second Phase of Education Reform”. Lifelong learning which was first introduced in the National Education Reform Act (1999) has now been expanded to give non-formal and informal systems an opportunity to expand learning for students of all ages, the workforce and the underprivileged. By educating all sectors of the society it increases the talent pool that can work in Thailand. This reasoning fits well with having students understand how to use English in specific situations. The use of technology in this second phase of reform has been made the responsibility of the Non Formal Education Department (NFED) project (2010-2012) to set up a, free e-TV station, separate from the existing cable channel. The NFED is in the process of adjusting curriculum to better meet student needs for this eLearning environment (MOI 2009).

The good aspect of the Reform II phase is the recognition of broadening the base of English language education as well as introducing an eLearning environment for the classroom. Implementing these strategies although positive and contemporary with other countries still does not address how the teacher will be trained to teach in these new classroom environments. UNESCO's most recent initiative for the Next Generation of Teachers (Next Gen) Project which is designed to assist Teacher Education Institutions (TEI) in the Asia-Pacific region to prepare the next generation of teachers to judiciously use technologies for teaching and learning has been launched to address the new classroom environment. The Bangkok effort has been developed by Dr. Warakorn Samkoset (Nation August 10, 09) who believes that the New-Generation of Teachers Project should significantly boost Thailand's educational services. The question still persists as to how these teachers are going to be trained and what educational pedagogy will be chosen to best address an information intensive world using all forms of digital delivery systems.

Consequently, looking at the entire learning environment from beginning to end has to be the number one priority for educational planning. As planning and educational theories are being discussed the tools and technologies which are being developed and quickly introduced into the classroom are done without any prior training on the teacher's part nor do the students have a complete understanding of the learning environment with which these new computer based tools are being introduced. There is a disjuncture between the learning strategies and the technological developments. These two disciplines obviously have to be brought together for a more effective use of utilizing educational theories as well as technological development. Can it be done? Where do we start and can the New-Generation Teachers Project address these issues?

The remainder of the paper will be devoted to active research and active learning as a methodology which teachers can become familiar with. These two areas are the main stays of the educational environment. Active research comes before active learning because the teacher has to become aware of what is being developed in the field of teaching with using the active learning methodology. Active learning depends on the integration of new findings gained from active research.

One of the difficulties of Active Research is that it is an on-going endeavor to learn the best procedures and innovations that are being developed by other researchers. Combining new findings and at the same time conducting an ongoing classroom activity using applied active research necessitates a flexibility in how to adopt the new research as it becomes available. It is safe to say at this point that there is enough literature and understanding on how best to create an effective learning environment using the available information about the learning process which can be gained from today's research. According to Baily (2001, p.490), the active research procedure begins when there is a need to address a problem or obtain an answer to a question. The Active Learning Pedagogy must start somewhere so beginning with the task of trying to discover what the best methodology available is to increase the students learning behavior would be the first task in this Active Research endeavor. It has been found by many institutions that the Active Learning Methodology offers one of the best approaches to increase the learning behavior of a student. A perfect example is the Active Learning and Teaching Methods Rationale developed by the Northern Ireland Council for the Curriculum, Examinations and Assessment (CCEA). Their web site offers a complete list of interactive learning techniques.

So let us assume that the answers to the research have been conducted and from analyzing all the available literature we are now ready to apply the findings in the classroom. It has been determined through many research studies, the CCEA being only one, that an active learning methodology was the best candidate to be adopted to develop a pedagogy for teaching students.

The next step in developing an Active Learning Pedagogy is to determine how best to define this new methodology and then extract from the methodology a strategy which will enable the teacher to begin the new teaching technique. Up to this point and from this level of analysis we have reached an interesting stage to develop our pedagogy. To save time in elaborating on all the stages necessary for the teacher to consider in this new pedagogy I will list six areas of concern which I feel need to be addressed for implementing an Active Learning Pedagogy for a New-Generation of Teachers.

A. Active Research
B. Cognitive activators
C. Cognitive domain development
D. Instructional aids – eLearning
E. Active learning techniques
F. Evaluation

Since it is beyond the scope of this paper to introduce every level of learning from a beginning learning environment to an advanced learning environment this paper will concentrate more on a general description of the contents of each one of the above areas as a way to show how each level in the pedagogy can be dealt with by the

teacher. If the teacher is going to use a methodology which enables learning in the class room it follows that a given set of strategies should accompany that methodology. The comments that are going to be expressed in this paper are those that would be applicable when considering an active learning methodology. The six steps that are mentioned are comprehensive and lead to a pedagogy which can be developed even further using the active learning methodology template suggested.

Classrooms more and more are being equipped with computers and within the computers are programs all of which play an important role in the handling of information as well as the teaching methodology to disseminate that information. The steps by which to introduce the computer (eLearning) into an active learning pedagogy needs a strategy to integrate the computer based environment with the techniques used in the active learning environment or an active learning system.

A. Active Research:

First, let's look at how to structure active research. According to Nunan (1992, p.3), active research has three components: (1) asking a question, (2) acquiring data, and (3) interpreting that data. If the teacher is going to ask the question about some aspect of the classroom learning environment then an understanding of which aspect of the students learning behavior is being questioned must be understood. The way in which the teacher evaluates that collected classroom data can be shared with other teachers or even submitted to an on-line web site which specializes in a collaborative exchange such as the Collaborative Action Research Network (CARN) site in the UK. How a teacher interacts in the classroom sets up a model by which students will mimic and

behave, and if the student behavior is not conducive to learning the parts of a given lesson then this has to be analyzed. I place action research first in the active learning pedagogy cycle. But it has to be understood that the active learning techniques a teacher is going to use are also very important. However, once all the parts of the active learning pedagogy are in place they act together in a cycle whereby all the stages fit together and work simultaneously (see fig. 1). I have placed evaluation at the very center of the cycle because change is occurring very fast in the learning environment as well as the data that is being added to each discipline which the student is studying.

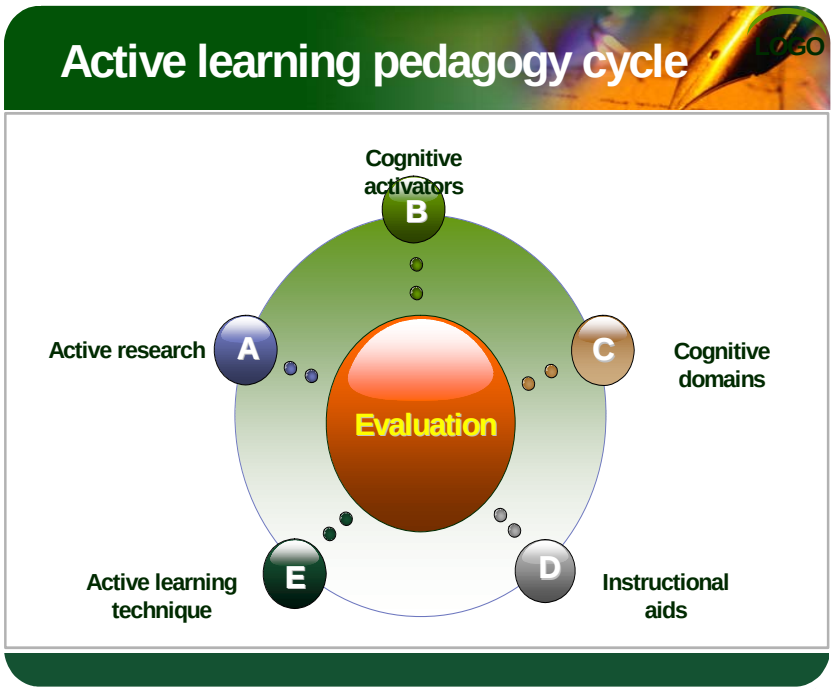

Fig. 1.

Therefore, an on-going monitoring of the effectiveness of each stage in the active learning pedagogy cycle is essential to stay timely with both teaching and learning Methodologies.

B. Cognitive activators:

A cognitive activator is a pre- active learning technique referred to as a **Cognitive Analogy** or even a **Cognitive Strategy**.

Cognitive activators are activities whereby students are asked to imagine how an idea or a fact, or even a procedure can be understood? As an example the student could be asked to demonstrate the shape of a car using a Lego block set or even a set of wooden blocks. The point is that one medium is used to describe another medium. Dr. LuAnn Jordan from the University of North Carolina has developed a whole series of cognitive strategies to help students make connections between one idea and another (Jordan 2005). Essentially what is being sought for using these cognitive activators is a way to influence the task as well as the learner. Bulgren, Deshler, and Schumaker (1997) refer to it as "content enhancement". In this stage of the cycle of an active learning pedagogy it is up to the teacher to first evaluate the content of the subject that is being covered. How best to have the student learn this content is aided by choosing instructional supports (cognitive activators) as well as adopting an active learning technique for the particular learning task. What the teacher is trying to do at this stage of the cycle is connecting the learner with the task using a pre-designed activity that has a similar cognitive routine as the one that is useful to complete the task. The cognitive activators are strategies that can be easily used to complete a task before the actual task is given. Given the fact there are many diverse tasks to learn in any given subject there are many cognitive strategies to consider. For example, if the task is word grouping whereby a student has to identify synonyms and antonyms in relation to a particular word a simple cognitive strategy that can be used is to organize many shapes by there size or there color. Then another activity could be to group words that describe a person in relation to their body parts i.e. color can be for eyes and hair,

weight can be for size such as skinny or fat, and personality can be adjectives such as angry or kind. In this example of using a cognitive activator the student learns to categorize or organize the information so it is easier to recall and use at a later time. After these initial exercises are completed a more complex word list can be developed. There are many different simple cognitive activators that can be used in preparing a student to learn a task.

C. Cognitive domains:

Determining beforehand what the knowledge base of the student is is very useful because it establishes for the teacher what the student knows beforehand so a strategy can be introduced for the material that needs to be learned. This is where association is so important because a student can build on their knowledge from something already known. This area is sometimes referred to as cognitivism whereby the teacher is trying to determine what the mental state of the student is. Cognitive activators that cover a wide range of helping a student use their cognitive abilities can be stimulated by the use of audio-visuals, pattern association, game completion and just about anything that engages the student to do something. It is here the teacher observes the student and determines what modality of learning may be the best to start with.

So, one area that needs to be addressed very seriously, beyond how pedagogy can be incorporated into the active learning lesson, is how to take advantage of the student's innate cognitive skills. By innate, I am referring to a set of mental functions which will invariably be activated within the student's mind in order to help learn the task the teacher has placed before them. There has been some recent ground breaking work in the field of social learning and social cognition (Casibra & Gergely 2006) which shows that the ability to teach and to learn from teaching is a primary, independent, and possibly phylogenectically speaking, an even earlier adaptation than either

language or the ability to attribute mental states. In other words there has been a dedicated system of knowledge transfer during the formative stages of human ontogeny all the way into adulthood. Human cognition has been an early adaptation from the very beginning of child development. Casibra & Gergely have discovered a dedicated cognitive system that requires active participation to convey generalizable knowledge rather than factual information. Their main thesis is that human pedagogy is an evolutionary adaptation for efficient knowledge transfer. Basically what we have is a cognitive domain (our minds) which is always seeking knowledge. The discovery made by Casibra & Gergely is that this acquisition function is built into the cognitive domains.

At this point as we recognize this natural ability to acquire knowledge, out lined by Casibra & Gergley, the concept of developing an active pedagogy begins to take shape. What this means is a pedagogy that has all the requirements of Bloom's taxonomy of learning but instills activity that is independent of the teacher. This is a paradigmatic shift in the way knowledge is normally taught. An active pedagogy means that students are active in their own learning and the classroom becomes a problem solving environment rather than a one way delivery or teacher centered environment. Active pedagogy coupled with active learning means creating a learning environment, or a classroom, where the student is encouraged to do something. However, even though this doing something is easy for the students, based on what we know about innate knowledge transfer, it's the teacher who has to anticipate the cognitive routines of the students. The teacher has to visualize in their own mind's eyes those processes that facilitate an action that completes a task by the student. This has always been a difficult hurdle to overcome when examples have to be used in a

teacher training environment. In order for a lesson to be adapted to cognitive routines the cognitive domain (the thought processes) of the intended subject, needs to be understood. In teaching physics how do you demonstrate friction or inertia or mechanical advantage incorporating a cognitive routine? In English how do you demonstrate an adjective or a superlative using a cognitive routine**?**

Trying to imagine a cognitive state is called metacognition (Vos, 2008). Vos is a professor from the University of Twente in the Netherlands. Vos states, "metacognition is the faculty of knowing about cognition. It includes: knowledge of the structure of knowledge, information or tasks associated with that knowledge; comprehension of texts, knowledge about self or others and the use of reflection". According to Vos this metacognition forms the basis for Active Learning. Vos is well aware of all the modes a student uses to learn something. He knows the student is not restricted to only using their ears and hands for writing notes, their tongues for answering questions, or their eyes to look at the teacher. Vos sees metacognition oriented to the mental processes that occur with cognition. Therefore, according to Vos the learning objective on the teachers part is to understand the metacognitive level as formulated by the teacher and understanding the mental states and processes that comprise that state.

Metacognition on the other hand refers to higher order thinking (Livingston 1997) which involves active control over the cognitive processes engaged in learning. Another way at looking at this is "thinking about thinking". What this means is a student has to think about what the meaning of the lesson is before the lesson is acted upon. The student has the ability to know before hand what is involved in the lesson such as how much time it might take to do the lesson or what information is needed

before the lesson can be started. In metacognition the student has the necessary knowledge about the knowledge that is needed to complete the lesson. The metacognition component is where the student thinks about what is needed for the cognitive component which is how to solve the problem.

This area of cognitive domains is a very subjective area but it is one in which every student brings to the classroom developed and stimulated from a wide background of social, cultural and environmental influences. How the teacher adapts to this for the students will make a big difference in how the student relates to the information and how well that will be retained in memory.

D. Instructional aids:

There can be no question that the laptop computer and mobile devices (as seen in figure 2.) are going to be used more widely in such a way that a student will access

Fig 2.

information by their mobile phone and depend on new innovations to learn how to acquire data. According to Dr. Laohajaratsang of Chiang Mai University the next generation eLearning tool must support mobile learning (Laohajaratsang 2004).

A further development in instructional devices is the P2P (Peer to Peer) Active eLearning Space (seen in Figure 3.) which is being developed at Hangzhou Dianzi University in China. This Active Learning Space (ALS) has a distributed arrangement with a server acting as a course manager, learning space manager and a learning material manager. Coupled with this is a teacher node, a student node as well as a guest node. Teachers and students can participate in the eLearning sessions from their distributed sites. According to Xianghua Xu and Jain Wan the ideal eLearning environment should support an active learning community using multiple roles whereby students are taught by others not only by the teacher as well as the students being able to educate others in the community.

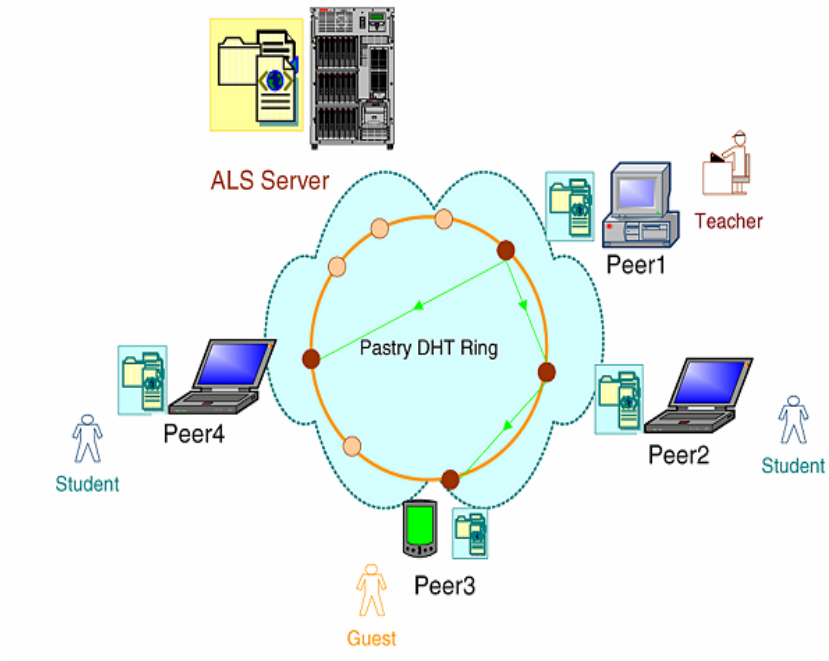

Fig. 3.

Dr. Laohajaratsang has already said that the next generation of eLearning tools should provide instructors with more advanced ways to create simulations of real-world situations in a virtual environment.

The planning committee of the "New-Generation of Teachers" which is part of the National Education Reform Act of 1999, now Reform II, needs to be aware of these developments and insure that a nationwide IT infrastructure is developing at an equal pace to accommodate these new learning technologies. One of the most important factors to learn from these new developments is the need on student's part to use many different devices to acquire the information they require for their lessons. To stimulate the student, the classroom must have a variety of ways to support the student in their subject in order to take advantage of the many different cognitive levels and skills they bring to the classroom. It is predicted by William M. Habermehl, superintendent of Orange County schools in Los Angeles, that within five years all students will be using digital textbooks (Lewin 2009). Along with digital text books there are blogs, ipods, and open-source materials from universities around the world. There can be no question that the future is already here.

E. Active learning:

Using Active Learning Techniques in the classroom:

There are many active learning techniques which have been designed to encourage independent learning for the students in the classroom. The notion that the classroom is no longer a teacher centered classroom but a student centered classroom is a significant change in the way knowledge is transferred to the student. Most teachers throw up their hands when they are told to let the students figure out what they are suppose to learn leaving the teacher wondering what they are suppose to teach. In other words if a teacher initiates an active learning technique such as scaffolding, or

think-pair-share, what is the teacher's role in the class room while the students are busily involved in their active learning exercise? This question gets even more complex when evaluation and testing of what the student has learned is initiated. Pedagogically speaking the teacher in an active learning classroom should have pre-designed steps prepared for the exercises a student will participate in, which in turn will challenge the student to increase their own learning skills. An easy exercise can be followed by a more difficult exercise until the teacher has fulfilled the design criterion for an active learning technique and the student has a working knowledge of the exercise. The following is an example of this pedagogical framework demonstrating active learning techniques.

It has been my experience that if students can discuss their lessons with other students in the classroom then the student engagement is very helpful is solving problems related to the student's assignment. Furthermore, this interactive approach enables the students to find common understanding about the problems which exist in the assigned lesson**.**

The following example demonstrates three active learning techniques to help the student understand their assignment in a group setting.

1. **Think-Pair-Share**
2. **Collaborative Learning**
3. **Scaffolding**

One of the most powerful ways to introduce active learning techniques is by changing the seating configuration for the **Think-Pair-Share** technique. This technique is where two students try to solve a problem together or complete the assignment together by sitting across from one another and asking each other questions.

After the students have experienced the **Think-Pair-Share** technique the next strategy is to apply the **Collaborative-Learning** technique. In this technique the students are next arranged into groups of three or more and collectively produce the required answers together. Incorporated into these two active learning techniques is a third active learning technique known as **Scaffolding**. "Scaffolding refers to providing contextual supports for meaning through the use of simplified language, teacher modeling, visuals and graphics, cooperative learning and hands-on learning" (Ovando, Collier, & Combs, 2003, p. 345).

The implementation of **Scaffolding** allows the students to be exposed to an increasingly more difficult or comprehensive task. The goal of **Scaffolding** is help the students reach a higher state of problem solving.

When the students participate in an active learning exercise for the acquisition of English as a second language it becomes more difficult because the students are left to experience the language without the teacher explaining grammar points, composition, or conversation. Learning a second language with active learning techniques requires several steps that need to be incorporated into the active learning exercise before the student learns a particular grammar point.

Active learning takes on a more robust engagement for the teacher because even though the teacher may not be fully involved in the student learning activities the lesson that is designed using one or more of the active learning techniques needs to be considered first before giving an assignment to the student. Another point the teacher needs to consider is how to anticipate a cognitive routine that the student will utilize when attempting to learn a task which the teacher has designed in the lesson. Taking

into account that a learner may not always find the exercise easy to perform necessitates the teacher to vary the active learning techniques to optimize the cognitive development of the student. Not all students have the same learning style even though each student must learn the same exercise. Some students are reflective and prefer to work alone and others who are active in their learning with asking questions and working in pairs or groups is a factor the teacher must consider when helping their students learn a lesson.

Dr. Chet Meyers from the Community College of Aurora, Colorado has developed a program titled "Overcoming Impediments to Active Learning." His approach is to develop the basic assumptions of the Active Learning pedagogy and then outline the Corollary Principles to Guide the Practice of Active Learning. Meyers believes that the purpose of active learning is to get students to interact with our disciplines in ways that cause reflection. Students can more readily synthesize new learning with old when they have worked with the new information and somehow made it their own.

It has been my experience that if students are allowed to work together in groups it increases their opportunity to communicate with one another leading to more understanding on how best to complete the lesson. When a similar lesson is then presented to a student on an individual basis the ability of the student to complete the lesson is usually enhanced.

Lastly, the University of North Carolina at Chapel Hill's Biology Department headed by Dr. Brain Rybarczyk introduced **Concept Maps** (see fig. 4.) as one of the many techniques in Active Learning.

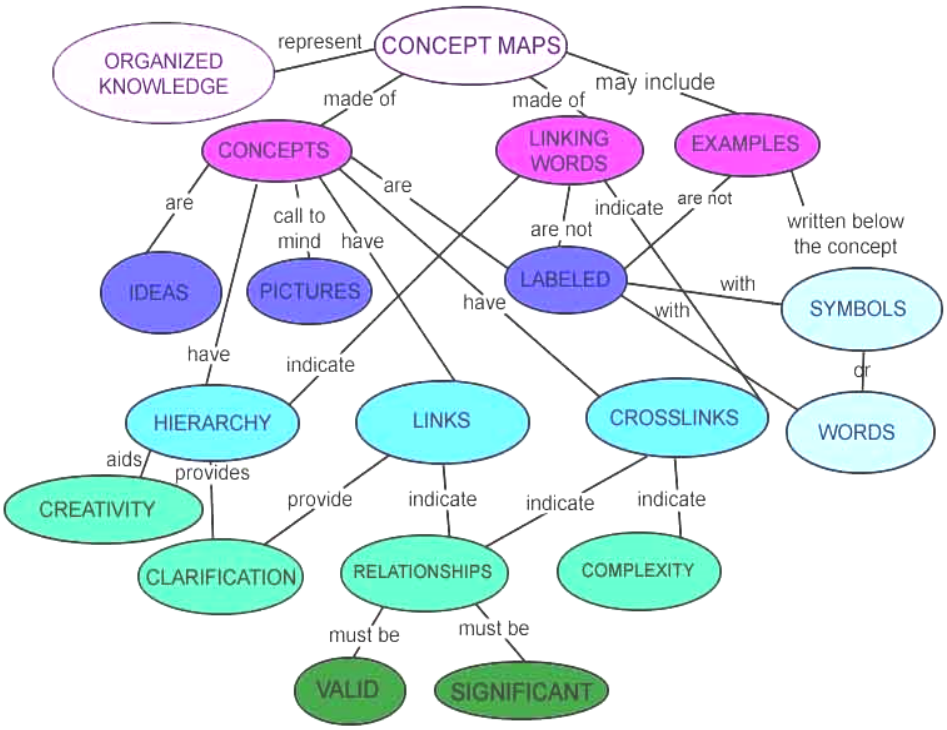

Fig. 4.

The concept map helps students represent knowledge in graphs by connecting their ideas so they can see how ideas are related and linked to one another. At the end of Dr. Rybarczyk's lessons he lists several suggestions for all Active Learning instructors to consider.

- State expectations
- Incorporate assessments with activities
- Start off simple (low risk)
- Ask questions, walk around classroom, be attentive to student questions
- Have students rely on each other.

This then is a brief example of how different active learning techniques can be utilized in the classroom. This paper does not have the space to go into detail on how all the active learning techniques can be applied.

Evaluation:

Does it work? What are we looking for? I have placed evaluation in the center because all of the other stages of the active learning pedagogy cycle are in constant flux and change. From the very beginning when the teacher is gathering the results of a lesson and sharing it to gain feedback to order bring about improvements in the techniques employed will always be an on going endeavor. The teacher is always observing the outcomes of the student's actions.

The cognitive activators will give immediate feedback as the student tries to complete a task not knowing that it is related to the learning goals the teacher has in mind. In this evaluation there is a lot of play and relaxation because it appears the tasks are easy. However, some students will prefer to do one thing one way and some another way. There are many cognitive activators from which to choose which makes this stage in the cycle very inviting for the students.

Then the cognitive domains are introduced where the teacher has to apply a strategy that takes advantage of the way in which the students had achived their results from using cognitive activators. Some students will be more prone to reading others to speaking and others to self learning rather than collaborating with other students. Individual, pairs and groups all come into play before the instructional aids are used. The materials which are used at this stage are going to be more and more dependent on electronic technologies. Using word processors, search engines, hypertext resources, distributed networks and more will become the norm and it will be wise to

introduce several ways a lesson can be developed using these technologies before the class begins. But even if the classroom is not heavily dependent on these electronic technologies the modes of learning by verbal engagement or other uses of language skills can still provide a variety of ways to have the student participate in the active learning environment. It is the goal to have the student feel as if they have been able to find the answer to their problems using their own ability.

The active learning techniques are those techniques the teacher is going to use throughout the entire active learning pedagogy cycle. It is the active learning technique which is the guide to solving the problem presented to the student. Modification in the use of these techniques is very similar to constructing a lesson plan except the difference is there is a feedback loop being brought into play using the active learning pedagogy cycle as the lesson continues. Once the teacher learns the cyclical approach to teaching verses a sequential approach with only a one way delivery of the information there will be a slow weaning off of the one way delivery and a more cyclical system will develop. So, why are we evaluating? The main purpose in evaluation is to improve projects by judging them and this comes by observation and this helps in modifying or changing a particular activity or program (Worthen 1990).

There are several types of evaluation which can be used in determining the effectiveness of the active learning pedagogy.

1. Diagnostic – Determining the goals at the beginning of the lesson to determine if the activities were appropriate.
2. Formative – A constant change regarding how best to present the lesson.
3. Summary – Was the goal achieved? Report the findings usually with a sheet at the end of the lesson.

Conclusion:

The active learning pedagogy cycle is a way by which to visualize the many parts that need to be considered when designing a lesson for the student. Even though there are only six stages in the model each one requires thoughtful consideration to address the learning environment the student is placed in. The teacher is responsible for creating the activities the student will be exposed to and it is up to the teacher to monitor and evaluate the student's progress in every technique that is being used in the classroom. If all the stages are addressed simultaneously in The New-Generation of Teachers Project (Saengpassa 2009), then the ease to manage each stage will be made easier. The tools being developed are changing rapidly and knowledge accumulation is growing exponentially. However, if techniques are developed early in a students learning cycle then access to information using digital tools will be easier. Students are already exposed to very sophisticated computer games so their dexterity in navigating complex game spaces and virtual environments is preparation for the same kind of learning behavior which can be introduced into the classroom using eLearning tools which are quickly becoming available as indicated by Xianghua Xu and Jian Wan.

Reform II needs to be taken seriously in Thailand because there will be a need for more and more teachers to educate a new generation of students who will be the new generation to guide Thailand into the future.

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Dedicated to my daughter Nanteta Van De Bogart who is now 7 years old.