Transformation of Traditional Teaching Methods to Modern Teaching Methods Based on Multimedia System

Context: This active learning course is targeted to change the traditional teaching methods used for the undergraduate first year (50 outstanding students from Biochemistry Specialization: 20 males and 30 females) with the course entitled "Water and pH". Previously, they had to listen to the lecturer and then they had taken some notes or sometimes they just copied the notes from the instructor or from the text. Thus, they did not have any inquisition or problem solving skills but only to follow rote-learning system.

Activity aims:

The new teaching technique aims to get the learners to:

- enhance the effectiveness of learning lessons or taking lectures
- achieve more concentration and interest on the course
- stimulate enthusiasm on learning and focus on student centred approach
- discuss more in the classroom, based on their knowledge and prescribed text as well as extending their inquisition
- explore more by using computer based learning system and they are relaxed to learn by playing some lesson games
- learn practically by using the devices and by learning through games
- see the real things with the help of multimedia instead of learning theory imaginatively or critically
- contribute lesson based knowledge beneficially to the real world

Why the activity was developed:

This activity was developed in response to sustainable development and active learning as well as the experience of my own teaching environment. I learned from TIDE Training that using a media approach could persuade the learners to learn and study actively. These days, most of the learners are lack of interest in their lessons because they just have to imagine the theory from the textbooks and they think that they are not real thing to study. Furthermore, in this

technological era, all the learners are eager to learn via media if they are familiar with the technology.

By practising new modern teaching method with multimedia approach, the traditional classroom will be transformed to initiate the students to engage with their environment adaptably and usefully without much difficulty in their studies. The learners have more fun to do some practical things in devices and they can check their understanding by answering or trying some software on devices. It is the most effective and easiest way to learn the new lessons with the help of some media and sometimes with the help of online resources, too.

It is easier to teach with the help of media: such as using presentation, video and computer-based learning. In computer lab, computer based teaching program software also enhances their inquisition practically by playing games or doing so. They can do some dangerous experiments in the computer software and as a result of this, they can avoid some risky situations but they can enjoy doing experiments in the computer as games. After that, they can have group discussion to engage their comprehension with the instructor or each other. By using modern teaching strategies with the help of technique, the scholarly learning environment can be encouraged.

The activity:

The transformation of traditional to modern teaching methods focuses on a student-centred active learning approach. By doing so, it aims to be more effective for learners to create a successful learning environment with a stress-free or worry-free and more relaxed comfortable classroom. Nowadays, most of the students are very familiar with the devices and games, so learning by playing is very suitable for the learners today. If they are more interested and happier in learning, the course they have learned in the university will be very applicable in their future life for both employment and for their life skills.

The classroom can be transformed to:

- be effective and successful learning situation
- conduct the learners to be stress free, more adaptable environment
- stimulate the learners' interests in the course by posing questions before starting the course and letting themselves in this real situation in the software
- use more multimedia such as power point presentation, computer based learning system or some television, smart phones, or smart devices, etc.

Transformation of the new modern teaching methods proves the learners' ability to:

- participate in the class discussion actively, confidently and enthusiastically
- try themselves to check their knowledge and experience
- explain their understanding about the course by using their own creation, power point presentation or some other various ways
- assess their level of understanding themselves so they will have self confidence in their work-force and wherever they stand

For example, in this new modern teaching approach with some technologies, the instructor or lecturer stimulated their experience or knowledge about the prescribed title before the lecture starts by posing rhetorical questions. Thus, they are more eager to learn actively and then the

lecturer conducted the lessons with presentation including appropriate illustrations and some images as well as videos. For instance, for the selected unit about "Water and pH" to teach, firstly, they can see the water bodies such as the sea, the ocean, the river, the lake, and the tank of water to drink, wash, cook, or so on in the illustration of the presentation to know that what water is. They can also see a view of the Earth from the space covered by water so they can understand how much water takes up the space of the total Earth. They can easily know why they should learn about water and why water is important. Then, they also learned the units of volume first before they estimated volumes of water stored in the Earth's natural reservoirs where some information and data are given but some of them needed to fill in by themselves. Here, they show their interest in their lecture by actively answering the questions and filling in the missing information and data. It is followed by a brief explanation with discussion. Then, they learned about using scientific notation for large numbers with the help of scientific calculator. They can change the notation comfortably by using their calculator and they have more fun than listening to the lecture all the time. To learn about raindrops, they show their interest while watching the slide show of raindrop and some water molecules. When they learned about atoms and molecules in water, they can understand better because of illustration, which shows different colours of atoms: hydrogen atoms and oxygen atoms. They can see how atoms can form molecules and they can learn various representations of water molecules according to the scientists and structures as well as bond natures. The process of reactions is in the video so the students can see all the reactions systematically without much difficulty in their learning and studying. Then, they learned about the relation of water and pH. The illustration of different pH and the properties such as acidic or basic are also in the chart of the presentation.

The preparation of the lesson includes some containers of water (e.g. cups, glasses, etc.) and water; various fruits such as limes, lemons, watermelons; some chalk powder; sugar, salt, etc. to make the solution to test the different pH values. Then, the students can enjoy preparing different solutions by using different types of fruits, or other things to check the changing value of pH for acidic, basic, or alkaline condition. For changing pH value for water, different water bodies such as soft water, hard water, tube-well water, potable water, seawater, or saline water should be prepared to test the different pH values of various types of water. To measure the pH value, portable pH meter or pH paper should also be ready for the experiment. Then, they have to measure the pH values for different types of solution or water bodies and they can compare their data with the reference chart. After that, they can draw graph based on their experiments. Thus, the students can enjoy the experiments like playing games and they have much worry-free learning.

Before each lesson, the teacher should read the lessons thoroughly and explore all the terms and words in details to search via internet for good explanation with images or illustrations, or definitions with appropriate examples. Then, they should prepare the presentation with images or illustrations, graphs, tables or relevant examples, equations, etc. including some suitable videos to catch the interest of the learners or to explain some stages to be clear enough. They should prepare some rhetorical questions to stimulate the learner's interest before each topic. After each lecture, they should note down what is good and what should be changed to be better the next time.

Feedback on the activity from students:

Students commented that they enjoyed learning via multimedia and they are not bored or stressed in the classroom. They can understand much better than the previous teaching method. They also dare to ask to the instructor whenever they are not sure or they do not understand well.

Compared to the previous traditional teaching method, the learners have more motivation in their learning environment and they express more interest by using the modern technique. Furthermore, they can memorize most by doing practically with the help of devices. One more benefit is that by participating in-group discussion after each lesson, they have more face-to-face interaction with other students and it can create a friendly situation to reduce stress in their learning.

Various issues have occurred in transformation of new teaching technique. However, some learners were unfamiliar with the devices, so they wanted to follow the rote-learning system, and they just want to copy and cram the short notes given by the instructors. Thus, they were reluctant to pose the questions, ask the questions to the instructor for unclear portion, or participate in the discussion and some were afraid of using devices or staying away from the technology. However, later, they are happy to handle the devices, and they can understand more and they are very active to participate in both posing questions and discussion by expressing their opinion. Previously, they have to learn through textbooks from teacher only and they do not understand the theory or concept well. In contrast, nowadays, with the help of technology, they can see the real process systematically without much effort. Thus, they can have more time for advanced study and their basic understanding promotes their further study. They think the lessons are more enjoyable in the learning and they can concentrate more on their course study. It is beneficial to learners and the teachers as well as the environment.

Strengths and weaknesses of the activity:

Numerous benefits and advantages can be seen by transformation of modern teaching methods using teaching aids since they can eliminate the boredom of classroom. The students are very delighted to attend the class with more motivation so they jump into the class and they overjoy to learn the lessons. They just feel that they are playing computer games instead of learning lessons so they learn much better than before. Most of them actively participate in course discussion and they have various points of view to make the lessons more interesting. They can learn higher-level course progressively if they can understand the basic concepts and the background theory thoroughly.

According to our country, one thing is that, not all classrooms are equipped with all the multimedia to use in our teaching, and sometimes, there are still problems concerned with electricity or connection so the traditional method has to be used occasionally. Some older students are afraid of using new modern devices because of the technology gap.

In new teaching method by stimulating the learners, there are other disadvantages as well. Even though most learners participate in the class discussion, some quiet students stay behind or they are still more reluctant to speak out or sometimes, active, talkative students also influence them. Another problem is that there might be difficulties for large classes with many students.

Keywords: Transformational education; modern teaching methods; multimedia; computer based teaching program

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