Using Story-Writing Techniques for teaching 4th Year Chemistry Students

Context: The Fourth Year students of Yangon University of Distance Education specializing in Chemistry have to take a module on chemistry entitled 'Module: Nanosciences'. The subject is very useful and topical. However, student engagement of these distance learners was not very active, perhaps because most students are employees who come to school only in tutorial sessions. It may also be observed that their learning at school has been too exam-oriented and consequently too theoretical. To amend the deeply-rooted mindsets of the undergraduates and 'boring' seasoned teaching styles, story writing techniques were first introduced to environmental classrooms in this semester with the hope that environmental learning would become more engaging and more practical.

Activity Aims: I wanted my students to:

- understand the fundamental relationships between physical properties and phenomena and material dimensions in the nanometre scale
- understand the nanotechnology application of these nano structures and the principles behind them to make nano scale devices and to produce new materials
- understand the technology of creating a nano-robot, which is a tiny molecular machine designed to perform a specific task whose components are at or close to the scale of a nanometre
- understand carbon in the form of diamond nano-composites because of the strength and chemical inertness of these forms.

The activity: The class (consisting of 52 students) was given an imaginary case study story about a nano-robot, which could be used to identify and measure toxins in the environment. The students were asked to take the role of researchers who wanted to develop a second nano-bot, which could break down toxins in the environment. They were asked to submit a group assignment covering the following for each group:

- the toxins the environment is facing
- the negative changes the toxicicty had made to the different lives of the residents, and who was most seriously affected
- the negative impacts the toxicity had on the soil and environment
- the factors they would consider in renewing the environment with better conditions to be able to face similar environmental issues (bearing in mind the negative conditions that helped the toxicity damage the well-being of the village more severely than expected).

The class was divided into five role-playing groups:

- people from the rural sector: agriculturalists, horticulturists
- people from the domestic industries
- construction workers
- people from fishery and livestock breeding fields
- professionals including researchers, teachers, medical doctors and nurses, and other government servants.

During the fortnight, the assignment was to be completed. The different groups must submit a report to their respective instructor covering all the questions mentioned above. The report must carry the different voices of the residents who suffered from the impacts of the toxins. The students could go to the library or conduct interviews with the residents who had had similar experiences.

Feedback from students: Initially, students were hesitant to carry out the assignment as they had not done such an activity before, exclusively in group work. After some minutes of encouragement, they gained some confidence and were promised jokingly that the best group would be the researchers of the nano-robots as winner of our story-writing classroom. Next, students were regularly given some guidance in understanding the different roles of the residents. Most of the time, however, students spent their time in the school library during the assignment period; the librarian confided in me that she found this semester busiest during the last decade.

I gained feedback from students through informal conversations and also feedback forms. At the end of the assignment, students reported that they had come to realize how environmental impacts can greatly change vulnerable ecosystems. They said that they could discern beyond the books and they are now eager to look into the real outside world. After finishing their assignments, they became inspired. They reported particularly that they enjoyed the time spent researching in the library. However, some mentioned that they felt uncomfortable using role-play to learn.

Strengths and weaknesses: The activity aroused the interest and strengthened the engagement of the students in environmental studies. What is more, they started to understand that not only toxicity but also other environmental impacts can affect our ecosystems. In the interim, the activity escalated the students' problem thinking skills and logical reasoning. Through writing the report they found their own voices and those of the 'people in trouble due to environmental pollution'.

Nevertheless, the activity demonstrated the difficulties of researching for accurate and up-to-date information in such a scenario, as well as of conducting dialogues with residents in the affected area. Timetabling constraints we had for this semester at YUDE were also challenging.

Acknowledgements: Special thanks go to the TIDE Programme which has been providing me with such a valuable insight into teaching environmental classrooms.

Key words: active learning; group work; role-play; nano-robot.

References

Department of Higher Education, Ministry of Education, Myanmar. (2018) Chemistry in Society and Water Chemistry (Module No. Chem-2014 & Chem-2019) Yangon: Yangon University of Distance Education.